

Spring 2007

# WILD FISH JOURNAL

SCIENCE EDUCATION ADVOCACY

SAVING PUGET SOUND:  
A SPECIAL SECTION, *see page 14*



Publication of the WILD FISH CONSERVANCY

# WILD FISH JOURNAL

Cover photo by Fred Felleman.



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The Wild Fish Journal is a publication of the Wild Fish Conservancy. Comments and letters are encouraged and welcome. Please send all correspondence to: Wild Fish Conservancy, P.O. Box 402, Duvall, WA. 98019. Office address: 15629 Main Street NE, Duvall, WA. 98019 phone: 425-788-1167, fax: 425-788-9634, email: [info@wildfishconservancy.org](mailto:info@wildfishconservancy.org)

# Washington Trout is now Wild Fish Conservancy

On February 7, 2007 Washington Trout changed its name to Wild Fish Conservancy. The decision was not taken lightly, and only after long and careful consideration. We believe the new name better reflects our mission; it is not meant to imply any fundamental change in our goals or strategies, but rather to communicate them more clearly, and to minimize ambiguities regarding our mission and affiliations.

After all, since the organization was founded in 1989, our work has always been about more than just trout; we have built a reputation as a leading advocate for the conservation and recovery of all of Washington's wild-fish ecosystems. From the beginning, we have engaged in research, advocacy, and restoration initiatives aimed at protecting, preserving, and restoring all of Washington's native fish populations, including populations of wild salmon, native char, marine rockfish, and even relatively unknown but vitally important species like Pacific lamprey, pygmy whitefish, and Olympic mudminnows.

Our primary focus has been and will remain the wild-fish resources of Washington state, but we always have and will continue to range significantly farther afield to effectively advocate for wild-fish conservation. Research on wild-fish populations and habitats in places as far away as Kamchatka has helped to inform our conservation and restoration initiatives right here at home, and resource-management policies in Alaska, British Columbia, Idaho, Oregon, and California can have a significant effect on wild-fish populations in Washington. A less geographically specific name will help to avoid potential confusion among funders, agencies, and even coalition partners we work with outside Washington state.

We wanted a name that was dynamic, meaningful, and did credit to the organization, its members, and supporters. We needed a name that accurately described what we do: advocating for scientifically credible and socially responsible wild-fish management; providing primary research on the status of wild-fish populations and habitats; restoring the capacity of wild-fish habitats to function ecologically, and; educating the public about the role and value of healthy wild-fish ecosystems. You might notice the recurrence of a particular theme in that impressive list: wild fish. And, an organization so dedicated to the conservation of a specific natural resource falls nicely under the definition of a conservancy. Ultimately, we determined that Wild Fish Conservancy is the name that most faithfully and clearly communicates who we are.

With your help, the Wild Fish Conservancy will continue to work for wild fish everyday. We look forward to joining you as we open this exciting new chapter in wild-fish recovery.

Sincerely,



Kurt Beardslee, Executive Director, Wild Fish Conservancy

# 16th Annual Wild Fish Soiree and Benefit Auction

**Tyler Cluverius,**  
*Outreach and  
Development  
Coordinator*

Join us on May  
19, 2007 at Chateau Ste  
Michelle, Washington's  
oldest and most  
acclaimed winery, for a  
memorable evening of  
gourmet food, fine wine, and lively socializing.



*The Darland family, Michael, Myrna, and Nicole, enjoy a light moment during the live auction. Photo by Phyllis Utti-Maslin.*

Since our founding in 1989, we have built a reputation as a leading advocate for the conservation and recovery of Washington's wild-fish ecosystems, under the name "Washington Trout." This February, to better reflect and more effectively communicate our mission, we changed our name to Wild Fish Conservancy. This year's Wild Fish Soiree will celebrate this exciting transition.

The Wild Fish Soiree, Wild Fish Conservancy's principal fundraising event, will begin with a silent auction and hosted reception at 5:00 p.m. followed by a gourmet dinner and live auction at 6:30 p.m. The Soiree is a great opportunity to meet and mingle with Wild Fish Conservancy staff, board of directors, and members, while bidding on a variety of items including exotic fishing trips, fly fishing equipment and accessories, weekend getaways, gourmet dinners, books, fine art, and much, much more.

Proceeds from the Benefit Auction go directly to support the Wild Fish Conservancy's work to preserve, protect and restore the region's wild fish. The Wild Fish Conservancy is reaching out to communities, influencing policy leaders, and advocating bold, innovative, and effective approaches to conserving salmon, steelhead, trout, and other wild-fish populations throughout the region.

The 2006 Wild Fish Soiree was a tremendous success. With the support and generosity of everyone at the soiree, we raised \$57,686 to help the Wild Fish Conservancy continue its fight to save the region's wild

fish. The generosity of our members was also evident when it came to supporting Fund-A-Dream. Over \$11,000 was raised to purchase Geographic Information System hardware and software to map, identify, analyze, and conserve critical wild-fish habitats throughout the region.

Following dinner and a key-note address by artist and author Ray Troll, auctioneer Jerry Toner led an evening of spirited bidding. Long-time supporters Michael and Myrna Darland of Southern Chile Expeditions generously offered two additional trips to Yan Kee Way Lodge in the Chilean Patagonia to high bidders, tripling the amount of money raised by their donation. The Darlands' generosity and commitment has for a long time made us feel fortunate to count them as friends and supporters. Wild Fish Conservancy awarded Myrna and Michael the 2006 Russell Foerster Award for their outstanding support and commitment to the Northwest's wild fish resources.

Thanks to the generosity of our donors, Wild Fish Conservancy has already received over 150 items for the 2007 live and silent auctions. These items include a Mount Rainier winter escape package for two, a private wine tasting for ten, a handmade bamboo rod from Fetha Styx, dinners at Seattle's finest restaurants, high-quality fly-fishing gear and accessories, guided fishing trips, weekend getaways, fine wine, books, and much, much more. Don't miss your chance to bid on any of these items.

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## OLYMPIC MUDMINNOW MAPPING

*Jamie Glasgow, WFC; Roy Iwai, City of Olympia*



*Olympic mudminnow (Novumbra hubbsi) collected within the City of Olympia. Photo by Jamie Glasgow.*

The Olympic mudminnow (*Novumbra hubbsi*) is usually found in slow moving streams, wetlands and ponds. Mudminnows require a muddy bottom, little or no water flow and abundant aquatic vegetation. The current known distribution of the Olympic mudminnow includes the southern and western lowlands of the Olympic Peninsula, the Chehalis and lower Deschutes River drainages, and south Puget Sound, west of the Nisqually River. They have also been documented in isolated portions of King and Snohomish County. They are found nowhere else in the world.

The Olympic mudminnow was designated as a sensitive species in Washington in 1999, because of the continued loss of and threats to its habitat, and its very limited range. State permitting and local Critical Areas Ordinances are the main regulatory vehicles to protect mudminnow habitat. However, the current mapping of mudminnow distribution among area streams and wetlands does not adequately identify specific locations where fish are present or where presence is presumed. No detailed surveys have yet been conducted at this scale. Better dissemination of existing and newly collected high-resolution mudminnow distribution information is needed, as are specific recommendations for best management practices where mudminnow are known or suspected to occur.

Washington Department of Fish and Wildlife (WDFW) has compiled all current known distribution data for the Olympic mudminnow. This provides a good foundation for more extensive basin-by-basin surveys to examine the distribution in tributaries, ditched channels, and small wetland areas typically not shown on regulatory or planning maps. Additional surveys are needed to identify critical seasonal habitat and refuge areas for the fish.

Wild Fish Conservancy is working with WDFW and the City of Olympia on a pilot project to systematically survey areas of known and suspected mudminnow presence in Olympia watersheds. These data, in conjunction with new detailed water typing information from Wild Fish Conservancy, will be made available to all local jurisdictions, tribes, and state agencies.



*Frank Staller, WFC field biologist, documenting Olympic mudminnow presence within the city of Olympia.*

Increasing development pressure requires Olympia to respond quickly to development needs while conserving natural resources. Limited city staff resources and the lack in expertise in field data collection and knowledge of current research methods is an increasing problem as the demands for information increases. The partnership with the City of Olympia combines Wild Fish Conservancy's experience in fish science with the city's ability to modify land management based on the findings of the study.

Wild Fish Conservancy, WDFW, and the City of Olympia have developed a new monitoring strategy specifically for Olympic mudminnows that includes monitoring in small wetlands and ditched tributaries. The strategy also calls for a range of sampling methods to best measure mudminnow distribution. As a pilot study, this effort will be an important catalyst to better understand the distribution of this unique fish in the Thurston County region and across its range.

**UPDATE FROM ICICLE CREEK**

*Eliot Drucker, PhD.*

Wild Fish Conservancy laid groundwork in 2006 for a long-term study of ecological change in the Icicle Creek watershed. Recent improvements in fish passage at the Leavenworth National Fish Hatchery (LNFH) have opened up miles of high-quality habitat. We hope to use Icicle Creek as a model to explore how a large section of watershed that has been long isolated from the influence of anadromy responds to the removal of fish passage barriers; to learn how the process of recolonization by migratory fish occurs, and; to examine how the return of anadromy impacts overall watershed health.



*Eliot Drucker recording survey results at boulder cascade in upper Icicle Creek, August 2006.*

In August 2006, Wild Fish Conservancy staff snorkeled 18 miles of mainstem Icicle Creek, collecting data on fish species composition, distribution, and relative abundance. Eleven species of fish were observed, including trout, salmon, and char. Investigators documented bull trout in the upper Icicle basin, well above all man-made impediments and a suspected natural barrier to fish movement in the mainstem Icicle. This suggests that recent improvements in fish passage at LNFH have given fish the potential to utilize a far broader range of habitat in the Icicle Creek watershed, and that a boulder field above the hatchery facility likely allows at least some fish migration, contrary to previous hypotheses.



*WFC snorkel survey team from left: Brent Trim, Micah Wait, Eliot Drucker, Nick Gayeski, Jamie Glasgow, Thomas Buehrens, (front row) Kurt Beardslee, Ben Burrill, and Josh Robbins.*

Resident rainbow trout were collected and implanted with PIT tags to allow tracking of fish movement. Tissue samples from these fish were also collected for genetic analysis in collaboration with Dr. Gary Winans of NOAA Fisheries. Invertebrate prey organisms were sampled to study food-web dynamics.

Taken together, the data collected during 2006 and 2007 contribute to a snapshot of ecological conditions in the early months of the return of anadromy to Icicle Creek. Establishment of this baseline is critical for detecting signs of ecological change in subsequent years during which habitat above the hatchery is fully and permanently reconnected.

The Wild Fish Conservancy gratefully acknowledges the Icicle Fund’s commitment to environmental stewardship in the Wenatchee River Basin, and its financial support of this research program in the Icicle Creek watershed.

**GEORGIA BASIN PUGET SOUND RESEARCH CONFERENCE**

*Eliot Drucker, PhD.*

The 2007 Georgia Basin Puget Sound Research Conference was attended by researchers, resource-managers, and policy makers from around the region, presenting and hearing new information about the conservation and management of the wildlife and habitat resources in Puget Sound and the Georgia Basin. During a session on juvenile salmon habitat, Wild Fish Conservancy Conservation Ecologist Micah Wait presented a summary

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# Advocacy Updates

## PUGET SOUND PARTNERSHIP

Puget Sound is threatened by water pollution, contaminated sediments, and degradation of estuarine and freshwater habitats, resulting in sharp declines in populations of salmon, rockfish, marine birds, killer whales, and shellfish. In response, Washington Governor Christine Gregoire has convened a public/private group called the Puget Sound Partnership to develop a plan to restore and protect the Sound by 2020. People for Puget Sound represents the conservation community on the Partnership.

In May 2006, Wild Fish Conservancy began participating on a “caucus” organized and led by People for Puget Sound to help develop a conservation agenda to present to the Partnership, as well as strategies to achieve that agenda. The caucus included People for Puget Sound, the Puget Soundkeepers Alliance, Public Employees for Environmental Responsibility, the National Wildlife Federation, The Nature Conservancy, Wild Fish Conservancy, and other regional and national conservation organizations. Wild Fish Conservancy advocated within the caucus for greater use of Marine Protected Areas in the Sound, as well as stronger controls on stormwater and other measures to better protect rivers and other freshwater habitats associated with Puget Sound.

## WASHINGTON STATEWIDE STEELHEAD MANAGEMENT PLAN

In 2006 Washington Department of Fish and Wildlife invited advocates of sport fishing and conservation interests to participate on a Steelhead Plan Advisory Group, to provide review and input for the development of a revised statewide steelhead-management plan. The Advisory Group began meeting monthly in July 2006.

Wild Fish Conservancy has been represented on the Advisory Panel by Aquatic Ecologist Nick Gayeski and Conservation Analyst Ramon Vanden Brulle. The conservation caucus on the Advisory Panel includes the Wild Steelhead Coalition, the Wild Salmon Center, Federation of Flyfishers Steelhead Committee, and the Washington Council of Trout Unlimited.

Working with the conservation caucus, Wild Fish Conservancy has expressed its concern that WDFW’s estimate of historical steelhead abundance is too low, that WDFW needs to more adequately define and designate

genuine wild-only steelhead management zones, and WDFW needs to drastically alter, reduce, or eliminate current steelhead hatchery programs, and conduct scientifically credible tests of any proposed hatchery reform measures.

## WDFW STEELHEAD ASSESSMENT

In summer 2006, the Washington Department of Fish and Wildlife issued a public-review draft of *Oncorhynchus mykiss: Assessment of Washington State’s Anadromous Populations and Programs*. The “Assessment” was developed by WDFW to create the scientific foundation for revised management plans for steelhead populations throughout the state. On September 15, Wild Fish Conservancy submitted a review of the Assessment.

Wild Fish Conservancy found that the public-review draft includes valuable information. However, WDFW’s assessment of the current status of many populations suffers from an inadequate and inaccurate historical perspective, leading it to underestimate the historical abundance, diversity, and spatial structure of some populations. The public-review draft is uneven in tone and substance, allows long-held, internal management assumptions and objectives to influence assessments and findings that should more appropriately be based on scientifically objective evidence and procedure, and it omits and ignores some available scientific recommendations. In particular, we found WDFW’s analyses of artificial production incomplete and unconvincing, dominated by biased assumptions and



David Crabb, Kurt Beardslee and Dale Russell encounter wild steelhead while conducting a nearshore habitat survey on the west side of Whidbey Island. Photo by Micah Wait.

unsupported assertions. We recommended that WDFW significantly revise the public-review draft, relying more heavily on the findings and recommendations of the Bonneville Power Administration's Independent Scientific Advisory Board, NOAA Fisheries' Salmon Recovery-Science Review Panel, and other independent researchers.

### **PROPOSED UPPER COLUMBIA RIVER RECOVERY PLAN**

On November 28, 2006 Wild Fish Conservancy submitted comments to NOAA Fisheries regarding a public-review draft of the *Proposed Upper Columbia Spring Chinook Salmon, Steelhead, and Bull Trout Recovery Plan*. We found the proposed recovery plan lacked adequate detail with regard to quantitative standards associated with specific recovery objectives for each of the listed species. We believe it is uncertain whether the proposed recovery plan can secure the recovery and delisting of any of the listed species, and we recommended that NOAA fisheries resubmit the proposed recovery plan to its authors for revision.

### **WHITE RIVER SUPPLEMENTATION PROGRAM**

On January 2, 2007 Wild Fish Conservancy submitted comments to NOAA Fisheries regarding an ESA Section 10 direct-take permit application and associated NEPA Environmental Assessment for a proposed spring-chinook supplementation program in White River.

We agreed with other reviewers that the application and EA both lacked significant detail, relied on unsupported assertions, and ignored important information and its implications. We found the EA inadequate, that NEPA requires NOAA to develop a full Environmental Impact Statement regarding the proposed action, and that the permit application does not meet all section-10 criteria.

We focused the review on the project proponents' and NOAA's unsupported assertion that the proposed White River supplementation program will (and by implication, may be the only way to) avoid the immediate extinction risk for the White River spring-chinook subpopulation. A considerable body of scientific literature and evidence contradicts this assertion and its implications, and suggests that a high level of risk will be imposed by the proposed supplementation program on the genetic health and productive capacity of naturally spawning spring chinook in the White River and the UCR ESU. By failing to acknowledge or attempt to reconcile these scientific controversies and contradictions, NOAA runs the considerable risk of rendering an approval of the permit arbitrary and capricious. ❧

## Staff Updates

### **TYLER CLUVERIUS, OUTREACH & DEVELOPMENT COORDINATOR**



Tyler was hired in October 2006 as Wild Fish Conservancy's Outreach & Development Coordinator. Tyler comes to us from Washington, DC where he was an executive at an internationally recognized trade

association, managing complex education, outreach and development projects. He plans to focus on increasing Wild Fish Conservancy's visibility to the general public, broadening the membership and expanding our capacity through fundraising. Tyler understands the critical link between outreach and education, and he looks forward to working closely with the education team throughout the year.

Tyler and his wife moved to Seattle in 2004, relocating from suburban Washington DC. He says that for a newcomer, the Puget Sound Region is awesomely beautiful, and he's anxious to use his professional outreach, development, and marketing skills to help protect and recover the region's wild fish.

"This is an exciting opportunity to make a difference," says Tyler. "I know that sounds cliché but as an avid outdoorsman and fly fisherman, I've always wanted to work for a conservation organization."

Tyler grew up boating and fishing on Maryland's Chesapeake Bay, seeing firsthand the sad consequences of the abuse and exploitation of that watershed. Since moving to Washington, he has quickly learned about the plight of this region's wild fish and their ecosystems.

"I identify with the urgency and sense of purpose that the team here at Wild Fish Conservancy brings to their work," he says.

Tyler holds a BA in history from Saint Mary's College of Maryland and an MA in Irish Studies from The Catholic University of America. ❧

# Education/Outreach Updates

## **WILD FISH CONSERVANCY WELL RECEIVED AT AREA OUTDOORS SHOWS**

*Tyler Cluverius*

February 2007 was a busy month at the Wild Fish Conservancy. We hit the road, meeting and talking to outdoor enthusiasts at three of the region's most popular sportsmen's shows: the Washington Sportsmen's Show in Puyallup; The Fly Fishing Show in Bellevue; and the Evergreen Sportsmen's Show in Monroe. Wild Fish Conservancy staff and volunteers promoted our new name, presented information about Wild Fish Conservancy initiatives, sold memberships, and raised money by raffling a beautiful hand-made canoe.

With a prominent booth at each event, we had a unique opportunity to let the community know about our new name just days after it became official. Response to the change was overwhelmingly positive.

We were also fortunate to have with us at each show the beautiful cedar strip canoe hand built and donated by Bill and Trudy Kindler of Port Angeles. The boat is a real attention getter and at the three shows combined, we sold over 500 raffle tickets and 73 new memberships, raising nearly \$2,500 for our children's environmental education programs.

## **WILD FISH CONSERVANCY PROMOTES ICICLE CREEK RESEARCH WITH LOCAL PUBLIC**

*Casey Ralston*

In 2006, the Wild Fish Conservancy worked hard to promote its Icicle Creek research projects and provide educational resources in the communities surrounding the Icicle Creek watershed. In September 2006, the Wild Fish Conservancy operated a booth at the Wenatchee River Salmon Festival. Wild Fish Conservancy staff and volunteers presented environmental science activities for children and their families, and shared information with the local and visiting public about current research activities in Icicle Creek.

Wild Fish Conservancy Education Coordinator Casey Ralston has been working with the Barn Beach Reserve learning center in Leavenworth to develop a field-based outdoor education program for elementary school students from the Cascade and Wenatchee school districts. The program will offer students a first hand understanding of the Wenatchee Basin's ecology, incorporating elements



*Students from Foothills Middle School in Wenatchee observe sockeye salmon in the White River during a WFC educational field trip.*

of the Wild Fish Conservancy's successful Environmental Discovery Program. In October, Wild Fish Conservancy researchers collected data in the mainstem Wenatchee River. Using this information, Wild Fish Conservancy is developing educational materials to be used at Barn Beach Reserve and in other public programs.

In early 2007, Wild Fish Conservancy Conservation Ecologist Micah Wait and Science/Research Director Jamie Glasgow were interviewed on KOHO radio in Leavenworth. They described the snorkel surveys and other research activities Wild Fish Conservancy had conducted in Icicle Creek in 2006, identified the questions we are investigating, and outlined plans for 2007.

## **POSTER CONTEST PROMOTES RECOVERY OF ICICLE CREEK.**

*Casey Ralston*

In September 2006, Wild Fish Conservancy staff and volunteers hosted a *Happy Salmon Homecoming Poster Contest* at the Wenatchee River Salmon Festival at the Leavenworth National Fish Hatchery, to promote ecological recovery in Icicle Creek. Children of all ages painted how happy wild salmon will be when they can return past the man-made barriers that have blocked them from reaching pristine habitat in Icicle Creek. The contest was a tremendous success and everybody who participated had a great time.

Five-year-old Ryan Cooper from Cashmere, WA won this year's contest. Ryan's painting will be made into a poster promoting the recovery of Icicle Creek, and he was



Ryan Cooper, age 5, from Cashmere, WA. won first place in the 2006 Happy Salmon Homecoming Poster Contest.

awarded a \$100 gift certificate for McDees Art Center in Wenatchee. His painting was selected from almost 500 entries from children under 12.

Diversion dams, fish traps, and other structures associated with the Leavenworth National Fish Hatchery have blocked wild chinook salmon, steelhead, and bull trout from returning to over 29 miles of pristine historical habitats in Icicle Creek for over 60 years. Wild Fish Conservancy will return to the Salmon Festival in 2007, displaying Ryan's poster to promote the efforts of Wild Fish Conservancy and others to preserve Icicle Creek's wild fish.

### ENVIRONMENTAL DISCOVERY PROGRAM

Casey Ralston

In its fourth year, Wild Fish Conservancy's Environmental Discovery Program served nearly 400 third, fourth, and fifth grade students from Seattle, Duvall, Carnation, and Monroe. Wild Fish Conservancy staff and volunteers continued to provide an exciting classroom and field program offering students hands-on, interactive lessons about native plants and animals, habitats, water quality, and healthy ecosystems.

Teachers are excited about how the water-quality curriculum fosters critical thinking and allows students

to study issues in science, math, and social studies simultaneously. The unit reviews the water cycle and watershed functions, discussing point and non-point source pollution. Students identify different human activities that impact aquatic ecosystems, and in the field they collect water samples and conduct chemical tests to determine if the Snoqualmie River is a healthy home for salmon and other aquatic organisms. The students work together to collect, share, and analyze data, and to consider creatively what "healthy" really means. The kids are asking great questions and we've had some interesting discussions about wetlands, flooding, and dead zones. We want the kids to make connections between what they are learning in school and real-life environmental issues in the Puget Sound region.



A student practices using binoculars to observe birds during a Discovery Skills hike.

A lot of dedicated people help make this program a reality. Many thanks to our paid and volunteer field instructors who share their time and energy with the students and to those school teachers who make time to bring their classes out to Oxbow Farm.

### STILLAGUAMISH FESTIVAL OF THE RIVER

In August, Wild Fish Conservancy staff and volunteers hosted a booth at the *Stillaguamish Festival of the River* near Arlington. The two day festival is designed to help the communities in and around the Stillaguamish Watershed understand how they can help make Stillaguamish River healthier for people, fish and wildlife.

The Wild Fish Conservancy booth attracted enthusiastic crowds both days of the festival; children decorated and walked off wearing salmon "fish hats," while staff and volunteers used a watershed model to demonstrate how human actions on land can affect water quality and fish survival. Staff answered questions on how to identify different species of salmon, trout, and char, and how to protect their habitats. ➤

# Wild Fish Get a PASS at Leavenworth National Fish Hatchery

## Wild Fish Conservancy Challenges USFWS to Stop Harming Listed Steelhead and Bull Trout in Icicle Creek

Mark Hersh, *Wild Fish Conservancy Water Quality Specialist*

In 2006, Wild Fish Conservancy negotiated two settlements with US Fish and Wildlife Service and the US Environmental Protection Agency that will promote significant progress toward restoring fish-passage, water quality, and habitat conditions in Icicle Creek, and to ending illegal harm to threatened steelhead and bull trout at the Leavenworth National Fish Hatchery. Icicle Creek, a tributary to the Wenatchee River near Leavenworth, WA, supports populations of resident trout, chinook salmon, and federally protected Upper Columbia River steelhead and Upper Columbia bull trout, both listed as threatened under the Endangered Species Act. The Leavenworth National Fish Hatchery violates the ESA and the Clean Water Act by blocking fish passage, harming and killing listed fish in improperly screened water-intakes, degrading habitat conditions in the stream channel, and discharging excessive amounts of pollutants into Icicle Creek.

The settlements will improve water quality in Icicle Creek, reduce harm to listed fish, and preserve Wild Fish Conservancy's favorable position to influence changes to the operations at LNFH that will benefit wild fish in Icicle Creek. The settlements generated an invitation for Wild Fish Conservancy to participate in a "Project Alternatives Solution Study" of



the infrastructure needs at LNFH and a stalled Icicle Creek Restoration Project. We believe the PASS process can provide a productive means for resolving some of the ecological and legal issues associated with LNFH.

### CHALLENGES AND SETTLEMENTS

In August 2006, the Wild Fish Conservancy favorably settled a lawsuit filed in 2005 against the US Fish and Wildlife Service and the US Environmental Protection Agency alleging violations of the Clean Water Act at the Leavenworth National Fish Hatchery. The government agreed to issue a final wastewater discharge permit by November 30, 2006.

EPA prepared a permit in November 2006, but before it can be finalized, the Washington Department of Ecology can impose "conditions" on the permit, outlining provisions for maintaining adequate fish passage, instream flows, and other state water-quality standards, a process called "Clean Water Act certification." EPA is still awaiting Ecology's certification, and cannot finalize the Clean Water Act permit. We recommended to Ecology that LNFH submit a plan for achieving fish passage through the LNFH dams and establishing a more normative flow regime in the historical channel



*Icicle Creek bull trout observed in the historical channel during a summer 2006 WFC snorkel survey. Photo by Kurt Beardslee.*



*Hatchery staff remove a fish-blocking trash rack at the LNFH headgate dam in summer 2006.*

of Icicle Creek. A new Clean Water Act permit, with conditions required by Ecology, should include deadlines for compliance, require LNFH to upgrade facilities, and to reduce pollutant discharges, all of which will promote restoration of the Icicle Creek ecosystem.

In early 2007, we reached a favorable settlement over a 2005 complaint against USFWS over violations of the ESA at LNFH. LNFH agreed to monitor their water intake structure using a system designed by Wild Fish Conservancy, and the terms of the settlement allow Wild Fish Conservancy to amend the ESA complaint, alleging that LNFH is illegally harming Upper Columbia bull trout, listed as threatened under the ESA. Our fundamental claim will remain before a federal court: LNFH's operations are illegally harming federally-protected fish, and an ESA complaint based on a 2006 Biological Opinion on the impacts to listed bull trout from operations at LNFH provides a favorable position to influence changes to the operations at the hatchery that will benefit bull trout and all the wild fish of Icicle Creek.

### **FROM CONFLICT TO COOPERATION**

The hatchery is operated by the US Fish and Wildlife

Service, but because it is supposed to mitigate for the damage caused to fishery resources by Grand Coulee Dam, the operations are funded by the Bureau of Reclamation. Many Reclamation projects across the country have created controversies. To attempt to settle controversies and avoid lawsuits, Reclamation has developed a "Project Alternatives Solution Study" process in which agencies and interested groups work together to develop solutions. Reclamation invited Wild Fish Conservancy to participate in a PASS process at LNFH with USFWS, the Bureau of Reclamation, NOAA Fisheries, the Washington Department of Fish and Wildlife, the Washington Department of Ecology (both the Water Quality and the Water Resources programs), and the Yakama Nation.

Because Wild Fish Conservancy has experienced difficulty and delay working with USFWS in the past, we were guarded at the outset. We knew we would need to invest considerable resources, but also believed that the team was more likely to find a comprehensive solution if Wild Fish Conservancy participated. The team meets often; agendas are long and discussions substantive. Wild Fish Conservancy spends many hours in research, consultation with other professionals, investigating alternatives, and other preparations for PASS meetings in Leavenworth, WA, a two-hour drive from Wild Fish Conservancy offices in Duvall. The PASS process is ongoing, and still at a relatively early stage, but our initial



*Spawning chinook at mouth of the unseen water intake at LNFH.*

caution has given way to a belief that the process is a good faith effort to arrive at workable solutions. Wild Fish Conservancy participation is influencing the process, and PASS discussions have even facilitated agreement and cooperation between Wild Fish Conservancy and LNFH on issues outside the review of the PASS team.

The hatchery withdraws water from Icicle Creek and groundwater wells, and discharges water back to

Icicle Creek after it passes through the various tanks and raceways. It's a lot of water, up to 26 million gallons a day, enough for a small city. For instance, the City of Spokane discharges 44 million gallons a day of treated wastewater. LNFH and Spokane have another thing in common, a problem with discharged phosphorus. Downstream from LNFH, Icicle Creek suffers from low dissolved oxygen and high pH in late summer. Because of similar problems on the Spokane River, the City of Spokane will be spending \$130 million on "tertiary" treatment to remove phosphorus. In the PASS Team's discussion on the hatchery water-intake system, it became apparent that complying with



*Renovated fish ladder at LNFH water intake dam. Structural improvements to facilitate fish passage were made by USFWS in July 2006.*

the new wastewater discharge permit would likely require upgrades to LNFH's pollution abatement system. At 26 million gallons a day, the upgrades might be very expensive, but something does have to be done to reduce the phosphorus discharged into Icicle Creek.

One solution would be simply to discharge less phosphorus and less water. Hatcheries all over the country are being built or retrofitted with water re-circulation technology, and such a system may be the best solution for the LNFH. A re-circulation system treats wastewater, then re-circulates it back through the water supply system

before discharging it back into the creek. Because so much water is re-circulated, much less wastewater is ultimately discharged, reducing the amount of phosphorus in Icicle Creek. The hatchery would also need to divert much less water from Icicle Creek and more normative instream flows would result.

The re-circulation system was considered early in the PASS process, but rejected by USFWS and Bureau of Reclamation as too costly. However, as other water intake alternatives were proposed that contemplated a discharge to Icicle Creek, Wild Fish Conservancy pointed out that the cost of phosphorus treatment must be included for those alternatives. We submitted research to the panel that was confirmed by other team members indicating that the cost of a phosphorus treatment system is many times the cost of a re-circulation system.

Wild Fish Conservancy participation in the PASS process has been time well spent. The good faith, collegial process has facilitated cooperation between Wild Fish Conservancy and Hatchery staff on issues outside the PASS review, such as enumerating and removing wild fish trapped in the settling building of the hatchery's water intake system. By the time you read this, a net designed by Wild Fish Conservancy should be in operation preventing wild fish from proceeding farther into the hatchery's workings and being killed or injured.

Our working relationship with the LNFH management is at an all-time high. The US Fish and Wildlife Service appears to finally recognize that LNFH cannot operate outside the law. The remaining ESA lawsuit, our participation in the PASS process, plus the pending Clean Water Act certification by Ecology are three avenues we believe will persuade USFWS to operate the Leavenworth National Fish Hatchery in greater harmony with the Icicle Creek ecosystem. We are confident that the positive changes we can help bring about at LNFH will serve a model for hatcheries throughout Washington and the Northwest. 🐟



**Work for wild fish everyday.  
Join the Wild Fish Conservancy.**

# Rescuing an Ecosystem Out of Balance

## *Saving Puget Sound; A Special Section*

**Kurt Beardslee**, *Wild Fish Conservancy Executive Director*

Puget Sound is an ecosystem out of balance, in trouble from bottom to top, from the streams and rivers that feed it, to its apex predator. Toxic sediments contaminate its depths while bulkheads and levees whittle away its shorelines and estuaries. Polluted wastewater continues to degrade Puget Sound's water quality. Invasive organisms and "dead zones" plague areas of the Sound. Extinction threatens two of Puget Sound's ecological and cultural icons, wild salmon and resident killer whales. Puget Sound chinook salmon and Hood Canal summer chum salmon have been listed as threatened under the Endangered Species Act since 1999; Puget Sound steelhead will likely be listed as threatened before summer 2007. Puget Sound's killer whale population, the Southern Residents, was listed as endangered in 2005.

Puget Sound is of course part of an even greater ecosystem often referred to as the Salish Sea, an inland sea that stretches from Tumwater, Washington to Johnstone Strait, British Columbia. Being part of this greater ecosystem compels us to have a broader perspective when considering the challenges facing Puget Sound. Species that evolved and are still present in the Salish Sea don't recognize political boundaries. The winds, tides, fish, and marine mammals have traveled these waters for the last eight to ten thousand years. The solutions we develop today for Puget Sound must incorporate the challenges and the needs of this greater ecosystem.

The challenges facing Puget Sound are all connected. The growing human population on the shores of Puget Sound has taken up watershed land, shorelines, surface water, and groundwater, diking, simplifying, and even drying up the Sound's freshwater rivers, streams, wetlands, and estuaries. We have discharged toxic pollutants from our farms, industries, sewers, and storm drains into the region's streams and directly into the Sound. We have mismanaged Puget Sound's wild-fish resources. Fisheries mismanagement and the loss of freshwater and marine habitats have decimated chinook salmon populations in Puget Sound. Chinook are the dominant prey of Southern Resident killer whales; the loss of chinook abundance has likely contributed to the decline of Puget Sound's killer whales, and may jeopardize their recovery.

To look at Puget Sound, you might conclude that this inland sea is too big, too deep, too formidable to be

significantly changed by human activities. But little by little we have been killing Puget Sound.

Like the challenges, solutions will have to be connected. Chinook recovery will require the conservation and recovery of stream, shoreline and marine habitats throughout the Puget Sound region. The recovery of ecosystem processes will help improve water quality and food-web health in Puget Sound, which will further benefit chinook and other fish species. Southern Resident killer whale recovery will depend on chinook recovery, and better fisheries management will not only support chinook recovery, it can conserve killer whales by immediately contributing to their prey base. If we manage Puget Sound with an ecosystem perspective, from top to bottom, we can save it.

Wild Fish Conservancy is committed to seizing that opportunity. Governor Gregoire's public/private Puget Sound Partnership has issued a set of proposals to restore and protect the Sound by 2020 ([www.pugetsoundpartnership.org](http://www.pugetsoundpartnership.org)). Wild Fish Conservancy is advocating for Marine Protected Areas in the Sound and elsewhere in the Salish Sea, stronger controls on stormwater, and other measures to better protect freshwater and marine habitats. We want a greater role for scientists. We are pressing for faster, more comprehensive, more reliable work in identifying and protecting wild fish habitats in Puget Sound's streams. We continue to challenge state and federal fisheries managers to comply with the ESA and reduce impacts on PS chinook from harvest activities. Working with coalitions of killer whale and Puget Sound advocates, we are contributing our perspective to SR killer whale recovery efforts.

In this special section on Saving Puget Sound, you can read about Wild Fish Conservancy's perspective and recommendations for contributing to both SR killer whale and chinook recovery. You can learn about our efforts to correctly identify and protect previously unidentified freshwater wild-fish habitats in streams and wetlands in the Puget Sound region. Puget Sound cannot be a successfully recovered without protecting and recovering the watersheds that feed it, and a fundamental requirement of that job will be the accurate inventory of the wild-fish habitats in those watersheds. Finally, we offer an

*Continued on page 29*

# Reforming Fisheries to Recover Puget Sound Chinook

## *Wild Fish Conservancy Challenges Salmon-Harvest Management in Puget Sound*

Svend Brandt-Erichsen

Federal, state, and Tribal managers are allowing salmon fisheries to catch 30 percent, 50 percent, or even 70 percent of threatened Puget Sound chinook salmon that are attempting to return to spawn in rivers around the Sound. Puget Sound chinook have been listed as threatened under the Endangered Species Act since 1999. Impacts this high are jeopardizing the recovery of PS chinook, and they are violating the ESA.

In October 2006, Wild Fish Conservancy, the Salmon Spawning & Recovery Alliance, the Native Fish Society, and the Clark-Skamania Flyfishers filed a complaint in Federal District Court against NOAA Fisheries Service, challenging the federal agency's approval of the *Puget Sound Comprehensive Chinook Management Plan*, intended to guide salmon harvest activities that impact PS Chinook until 2010.

NOAA evaluated the harvest plan against the requirements of the Endangered Species Act and found them acceptable. But the agency's own analysis shows that the harvest rates are too high for chinook from several rivers to take advantage of even currently available habitat. NOAA also acknowledges that harvest impacts are too high to allow many PS chinook populations to fully recover.

NOAA has grouped 22 Puget Sound chinook populations into a single evolutionarily significant unit, or ESU, and set general criteria for approving harvest plans that can impact the individual populations or the ESU as a whole. Primarily, harvest may not slow progress toward viable salmon populations, or toward recovery of the ESU. Simply put, the Puget Sound plan does not meet those criteria. Despite the protections that the ESA is supposed to provide, NOAA is allowing harvest under this plan to kill from 20 to 70 percent of the PS chinook returning to individual Puget Sound rivers. This leaves many important chinook populations at risk of being wiped out

NOAA approved the harvest plan by redefining a key concept that is central to its regulations: what constitutes a "viable" population of salmon. Under NOAA's own regulations, "viable" means a population has a negligible risk of extinction. But in evaluating the harvest plan,

NOAA defined "viable" to mean the carrying capacity of current habitat conditions – which has nothing to do with extinction risk, and produces a "viable" threshold an order of magnitude smaller than intended by the regulations. Improper use of the viable population concept infects all of NOAA's analyses, and skews its assessment of acceptable harvest rates. In fact, NOAA's own analysis shows that, even using the wrong target population levels, harvest rates are too high for chinook from key regions of the Sound to make any progress toward recovery, and several important populations will remain at risk of extinction.

Wild Fish Conservancy and its partners are challenging two NOAA decisions that authorize continuation of this level of harvest. The first is NOAA's decision that the *Comprehensive Chinook Management Plan*, developed by the state of Washington and Puget Sound Tribes, meets the agency's criteria for harvest plans. The second is the Biological Opinion, developed under section 7 of the ESA, in which NOAA determined that by approving the harvest plan, the agency would not itself jeopardize the survival and recovery of Puget Sound chinook. NOAA's approval of the Harvest Plan could not meet this test.

The same salmon populations that are subjected to harvest plan fisheries in Washington waters also are subject to Canadian fisheries, and some are caught in Alaska as well. When NOAA's analysis showed that these combined fisheries would prevent key populations of PS chinook from making progress toward recovery, the agency should have rejected the harvest plan, or found that its own approval of the plan would jeopardize the listed chinook. A jeopardy finding would have necessitated identification of "reasonable and prudent alternatives," like reducing the harvest in the US or Canada. Instead, NMFS brushed the problem under the rug and approved the plan.

NOAA is also required by the ESA to re-evaluate its Biological Opinion when new information indicates that more listed animals are being killed than expected, or the listed species is being impacted in a manner not considered during the initial analysis. In this case, there have been several new developments, including: new evidence that

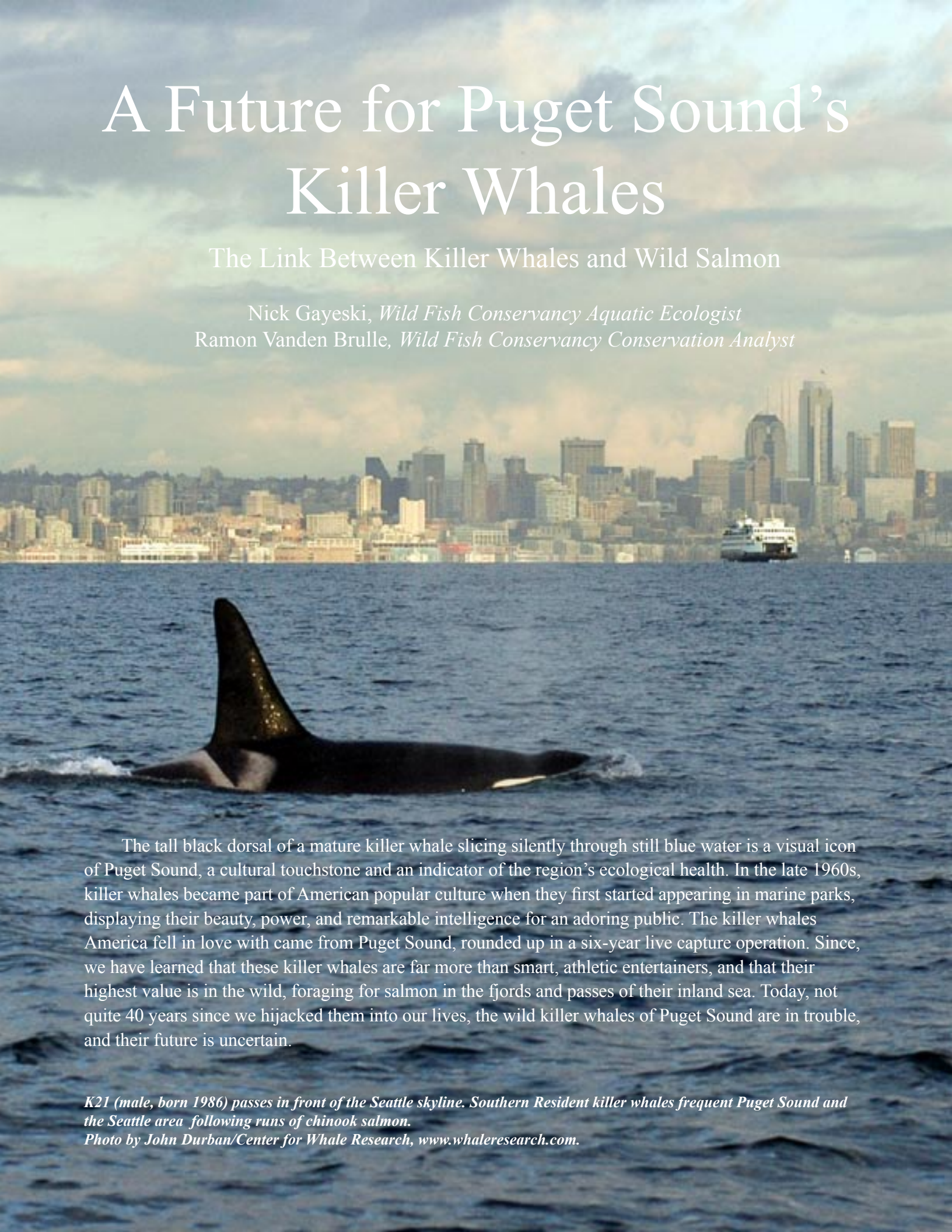
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# A Future for Puget Sound's Killer Whales

The Link Between Killer Whales and Wild Salmon

Nick Gayeski, *Wild Fish Conservancy Aquatic Ecologist*

Ramon Vanden Brulle, *Wild Fish Conservancy Conservation Analyst*

A photograph of a killer whale's dorsal fin cutting through the water in front of the Seattle skyline. The whale is dark with a white patch near the base of the fin. The water is a deep blue, and the city buildings are visible in the background under a cloudy sky.

The tall black dorsal of a mature killer whale slicing silently through still blue water is a visual icon of Puget Sound, a cultural touchstone and an indicator of the region's ecological health. In the late 1960s, killer whales became part of American popular culture when they first started appearing in marine parks, displaying their beauty, power, and remarkable intelligence for an adoring public. The killer whales America fell in love with came from Puget Sound, rounded up in a six-year live capture operation. Since then, we have learned that these killer whales are far more than smart, athletic entertainers, and that their highest value is in the wild, foraging for salmon in the fjords and passes of their inland sea. Today, not quite 40 years since we hijacked them into our lives, the wild killer whales of Puget Sound are in trouble, and their future is uncertain.

*K21 (male, born 1986) passes in front of the Seattle skyline. Southern Resident killer whales frequent Puget Sound and the Seattle area following runs of chinook salmon.*

*Photo by John Durban/Center for Whale Research, [www.whaleresearch.com](http://www.whaleresearch.com).*

Puget Sound's killer whales, sometimes called orcas, are known technically as Southern Resident killer whales. In 2005 the National Marine Fisheries Service declared SR killer whales an endangered species throughout their range, primarily Puget Sound, the Strait of Juan De Fuca, southern Georgia Strait, and the coasts of British Columbia and Washington. SR killer whales are in danger of extinction due to a small and declining population size, toxic contamination, reduction in quantity and quality of prey (primarily salmon), noise from marine motor traffic and sonar, and the potential for catastrophic oil spills.

SR killer whales occur in Canadian waters and were listed as endangered under the Canadian Species at Risk Act (SARA) in 2004. The neighboring but genetically distinct Northern Resident killer whale population was listed as threatened under SARA at the same time.

Both populations have suffered a recent period of significant decline. The Northern Resident population is at about 220 individuals, and there are about 90 SR killer whales in Puget Sound and nearby waters.

From May through October SR killer whales spend their time primarily in the Strait of Juan De Fuca, Puget Sound, and the southern Georgia Strait. During the summer and fall, SR killer whales overlap in their range with the Northern Resident population. During winter the majority of SR killer whales occupy coastal regions of southern Vancouver Island and Washington state, but can range as far south as central California.

The dominant prey of NR and SR killer whales are salmon, principally chinook, which have declined significantly throughout British Columbia and Washington. Puget Sound chinook are listed as a threatened species under the ESA. At least one study has shown a strong correlation between resident killer whale mortality and chinook abundance.

In response to the PS chinook listing, federal, state, local, and private entities in the region are developing broad initiatives to conserve and recover freshwater

chinook-habitats in Puget Sound. Wild Fish Conservancy has developed major restoration projects, advocated for better forestry, development, and agricultural practices, and identified previously unprotected salmon habitats throughout Puget Sound (see *Conserving the Lifeblood of Puget Sound* p.22). PS chinook recovery will depend in large part on the success of these and other habitat conservation measures, and local chinook populations may respond with increases in abundance, but it will take decades, time that SR killer whales may not have.

Of course declines in abundance threaten many PS chinook populations themselves, and Wild Fish Conservancy and other advocates have been concerned that current fisheries impacts may be jeopardizing the recovery of PS chinook and other listed salmon populations. Since 2000, Wild Fish Conservancy has been advocating to lower fisheries impacts on listed

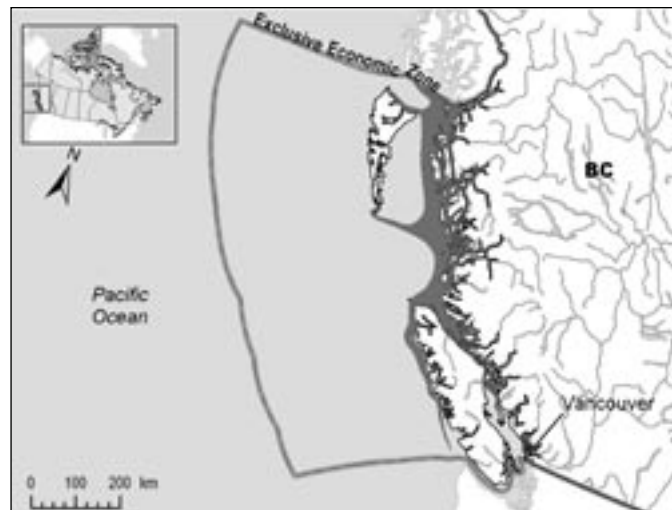
PS chinook and challenging NOAA Fisheries to manage salmon harvest in compliance with the ESA (see *Reforming Fisheries to Recover Puget Sound Chinook*, p.15).

Better salmon harvest management would avoid jeopardizing PS chinook recovery, and almost immediately increase the probability that SR killer whales will encounter enough salmon to support their recovery.

### KILLER WHALE ECOLOGY

Killer whales are certainly not wild fish. Like all cetaceans, killer whales are marine mammals, technically the largest species of porpoise. There are three killer whale ecotypes, offshores, transients, and residents. Each exhibits distinct patterns of habitat use, social organization, behavior, and diet. SR and NR killer whales are residents.

Resident killer whales live their lives within discreet geographic ranges, often inside waters, and feed almost exclusively on fish. In the northeastern Pacific they feed primarily on salmon, predominately chinook salmon. Transient killer whales range along entire coasts, and prey almost entirely on marine mammals, seals, sea lions, and whales. Less is known about offshore killer whales. They occupy marine waters 15 kilometers or more offshore and



Northern Resident killer whale range map. Map courtesy of Canadian Wildlife Service.

are thought to feed primarily on fish. There are distinct genetic differences between the three ecotypes.

Resident killer whale populations are subdivided into groups closely related by maternal descent (Ford et al 2000, page 25)\*. Pods are highly cohesive; they travel together, feed together, and have distinct and common acoustic dialects. A clan is a group of pods with closely related acoustic dialects. Populations (also referred to by researchers as communities) are made up of pods that regularly associate with one another. Pods from one community rarely or never travel with those of another even when their ranges overlap. Interbreeding among populations never occurs, but neither does breeding within pods. Within populations, males from one pod breed with females from other pods. After breeding, males return to their maternal pod.

The Southern Resident population consists of one clan divided into three pods (labeled J, K, and L). The Northern Resident population consists of sixteen pods in three clans.

In a healthy resident killer whale population, females have an average life expectancy of 46 years and a maximum age of 80. Females typically give birth to their first calf at 14 and have an average reproductive period of 24 years, producing on average 4.7 calves. Males have an average life expectancy of 31 years and a maximum age of 70, reaching sexual maturity at 13 but not attaining complete physical maturity until 18.5 years.

### RECENT HISTORY AND CURRENT STATUS

In 1967 the SR killer whale population was estimated at 96, recovering from a previous decline. In 1960 the population was estimated to have numbered 78 (Olesiuk et al. 1990, cited in Baird 2000). That recovery was interrupted from 1967 to 1973, when approximately 48 killer whales were removed in live capture operations. Thirty-five whales were relocated to public aquaria and at least another 12 died from capture attempts. By 1971, the population was reduced to 67 individuals, the smallest size in the period from 1960 to the present.

While both NR killer whales and SR killer whales were affected by the live capture program, Southern Residents suffered a much greater impact from the removals. Both populations began a period of recovery in 1971 that ended around 1996. The NR population grew steadily to 220, but the SR population increase was slower and more variable, peaking at 98 in 1995. Then a significant steady decline began in both populations.

Northern Residents declined to 201 in 2001, rebounding to 219 in 2004. Southern Residents declined to 81 in 2001, increasing to 90 today. The recent declines in both populations are due almost entirely to increased mortality rates, rather than reductions in birth rates or a combination of the two.

### THREATS AND LIMITING FACTORS

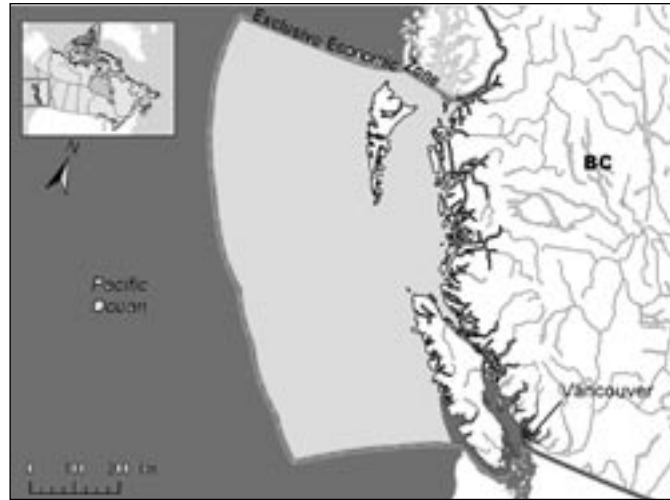
Long life-spans, late age-at-maturity, and the complex matrilineal social structure of the SR killer whale population make it difficult

to pinpoint the factors responsible for the population's decline. Directed hunting of SR killer whales as "nuisance predators" may have been a factor prior to 1960, but it does not appear to be a factor since the end of the live-capture period.

Factors that have been identified include: reduction in the quantity and/or quality of prey, toxic contamination, marine noise/disturbance, and the threat of catastrophic oil spills.

### Prey limitation

Researchers from Fisheries and Oceans Canada Pacific Biological Station found that almost 97% of killer whales' diet consists of salmon, 72% chinook, 21% chum, and less than 7% pink, sockeye, and steelhead combined (Ford and Ellis 2005). Based on calculation of the daily caloric requirements of killer whales, the current SR killer whale population needs to consume 800,000 adult salmon annually (Krahn et al. 2002, page 19). If chinook salmon comprised only 50% their diet, SR killer whales need to consume 400,000 chinook annually. Chinook salmon have declined significantly throughout British Columbia and Washington.

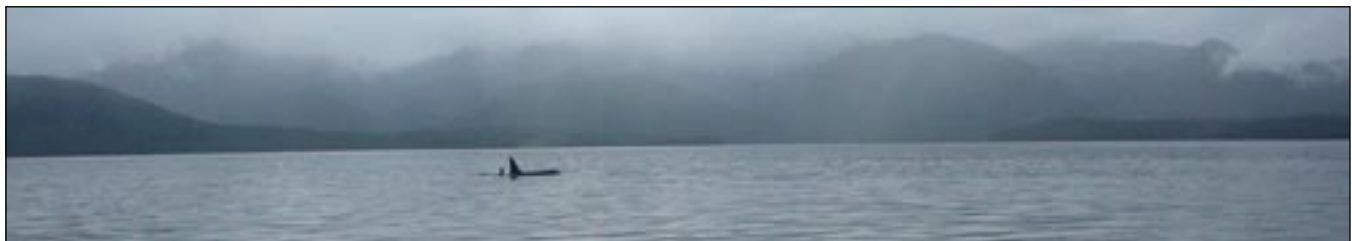


*Southern Resident killer whale range map. Map courtesy of Canadian Wildlife Service.*

Researchers have examined mortality rates of NR and SR killer whales for correlations with one another and with chinook abundance in several commercial fishery areas from Southeast Alaska to Washington State (Ford et al. 2005). In almost every area, they found a strong correlation between resident killer whale mortality and total chinook abundance (Ford et al. 2005, Figures 11, A2, and A3).

### **Toxic Contamination**

Southern Resident killer whales have been exposed to several kinds of toxic organochlorines (OCs), including polychlorinated biphenyls (PCBs), chlordanes, and DDTs. OC exposure has been strongly linked to deleterious biological effects, including immunosuppression and endocrine disruption, leading to increased mortality and decreased reproduction (Krahn et al 2004, pp. 59 - 62).



*Northern Resident killer whales off of Klemtu, British Columbia. Photo by Kurt Beardslee.*

OCs have a strong chemical affinity for fats, or lipids, and killer whales accumulate high levels of OCs in a large lipid storage compartment, their blubber. Mature females appear to have lower OC levels because OCs in their blubber are metabolized in the production of milk and transferred to their first-born calves.

### **Marine Noise**

Killer whales have a highly developed acoustic sensory system used for communication, echolocation, and navigation. Human generated marine noise might be masking and interfering with acoustic signals killer whales rely on, impairing their foraging, social, and reproductive success. Three types of noise could be adversely affecting SR killer whales: military and other sonar, motorized vessel traffic, and underwater industrial operations (pile driving and dredging).

The US Navy conducts sonar operations in Hood Canal and the Strait of Juan de Fuca. High-output sonar can damage killer whale hearing and disrupt behavior. The Navy claims to have developed sonar-operations guidelines to protect SR killer whales, but the guidelines are not mandatory. Seventy-three commercial whale-watching

boats serve 400,000 passengers annually in Puget Sound and southern Georgia Strait (Krahn et al. 2004, pp. 33-4). There is concern about acoustic impacts and that the large volume of boats may result in significant behavior disruption. One researcher has recommended a maximum allowable number of five boats within 400 meters of SR killer whales (Erbe 2002).

### **Oil Spills**

Southern Resident killer whales travel and forage together in large groups. A significant proportion of the entire population would likely be affected by an encounter with a large oil spill. After the *Exxon Valdez* oil spill in 1989, mortality rates in the resident killer whale pod in Prince William Sound increased from 3% in 1988 to 20% in 1989 and 1990. An annual mortality rate of 20% is unprecedented in North Pacific killer whales (Krahn et

al 2002., page 66); typical annual mortality rates in killer whale populations average less than 4%. Oil tanker traffic is significant and increasing in the Strait of Juan De Fuca and Puget Sound. Aging, single-hulled tankers are expected to be phased out and replaced with safer double-hulled tankers, but not until 2015 (F. Felleman, cited in Baird 2001).

### **RECOVERY**

With still relatively little known about SR killer whales and the reasons for their decline, it is difficult to develop a specific recovery plan and timeline. NMFS has proposed a principal criteria for SR killer whale recovery, that the population exhibit an increasing abundance trend at an average annual growth rate of 2.3% for 28 years. If the current population of approximately 90 SR killer whales sustained a growth rate of 2.3% for the next 28 years the population would number 170. In view of the current condition of Puget Sound and the state of chinook salmon populations, it will require considerably longer than 28 years to achieve these recovery criteria.

It appears likely that the threats of potential oil spills, marine noise, toxic contamination, and loss of prey will

all have to be adequately addressed to save Puget Sound's killer whales, but Wild Fish Conservancy agrees with many killer whale advocates that chinook salmon recovery will be a primary factor in SR killer whale recovery. If the current population requires 800,000 salmon (two-thirds chinook) to sustain itself, a population of 170 killer whales will require over 1.5 million salmon, a million or more of them chinook.

NMFS says too little is known about SR killer whale feeding ecology to determine whether SR killer whales are prey limited. We do know that chinook abundance in Puget Sound and southern Georgia Strait is well below historical levels. Puget Sound chinook have been listed as threatened since 1999. At least one study has shown a relationship between mortality rates among SR killer whales and chinook abundance. It seems reasonably clear that any meaningful recovery of killer whales in Puget Sound will require increases in PS chinook abundance.

To recover PS chinook abundance, the region, the state, and the US government are implementing new regulations, improved land-use practices, and restoration initiatives to conserve and recover functioning freshwater salmon habitats in Puget Sound. Wild Fish Conservancy has been involved in many of these initiatives. Long term PS chinook recovery will depend on these measures, but they are not quick fixes. It could take decades for them to increase local chinook abundance. That may be too long for SR killer whales.

It may be too long for PS chinook. Along with the loss of quality habitat, fisheries impacts are likely jeopardizing the recovery of PS chinook and other listed salmon populations. Fortunately, improving the management of salmon fisheries to secure PS chinook recovery would also increase the probability that SR killer whales will encounter adequate numbers of chinook to meet their biological requirements, and it would do it almost immediately.

Since 2000, Wild Fish Conservancy has been challenging NOAA Fisheries to lower fisheries impacts on listed PS chinook and manage salmon harvest in compliance with the ESA. In October 2006 Wild Fish Conservancy, with the Salmon Spawning & Recovery Alliance, the Native Fish Society, and the Clark-Skamania Flyfishers, filed a complaint against NOAA under the ESA, challenging its approval of the *Puget Sound Comprehensive Chinook Management Plan*, intended to guide salmon harvest activities that impact PS Chinook until 2010

The plan does not meet NOAA's own criteria for approving salmon-harvest plans. Abundance targets developed for the harvest plan are often less than one-tenth of NOAA's own goals, and NOAA acknowledges that currently approved harvest rates are too high to allow recovery for important PS chinook populations. NOAA Fisheries failed to consider changes in fishing practices as reasonable and prudent alternatives, and new information demonstrating higher than expected impacts on PS chinook requires NOAA to re-initiate its evaluation of the plan. We are asking the court to order NOAA to withdraw its approval of the harvest-management plan and develop more appropriate salmon-harvest regulations (see *Reforming Fisheries to Recover Puget Sound Chinook*, p.15).

In 2008 the US will begin negotiations with Canada to renew the Pacific Salmon Treaty. Achieving fisheries that contributes to the recovery and conservation of SR killer whales should be a principal objective of US negotiators. NMFS has an obligation to ensure that the Pacific Salmon Treaty adequately protects SR killer whales and does not jeopardize their recovery, and it should use its authority under the ESA, the Marine Mammal Protection Act, and Magnuson-Stevens Act to ensure the adequacy of a new Treaty. To buffer NR and SR killer whales against fluctuations in chinook abundance, some fisheries may need to be limited, and increases in harvest opportunities and levels should be tied to increases in survival and abundance of SR and NR killer whales.

Today, there is a worldwide emphasis on achieving ecosystem fisheries that explicitly manage for the biological requirements of top predators in marine ecosystems, including marine mammals. The recently renewed Magnuson-Stevens Fishery Conservation and Management Act requires fisheries to be managed for their impacts on non-target species, including predators. Krill and groundfish fisheries in the Antarctic under the Conventions for the Conservation of Antarctic Marine Living Resources are managed to protect marine predators, including seals, penguins, and whales. Salmon fisheries that likely affect killer whales should be treated no differently.

Southern Resident killer whales and Puget Sound chinook are both valuable and worth saving for the ecological roles they play within their entire ecosystem. One of the roles of PS chinook appears to be sustaining healthy populations of SR killer whales in Puget Sound and Georgia Strait. Southern Resident killer whales will

not likely be recovered without recovering PS chinook, and the PS chinook population cannot be considered effectively recovered until it is fulfilling all its ecological functions.

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# Conserving the Lifeblood of Puget Sound

## *We Cannot Restore the Sound Without an Accurate Stream Inventory*

Jamie Glasgow, *Wild Fish Conservancy Director of Science and Research, Ecology*



*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

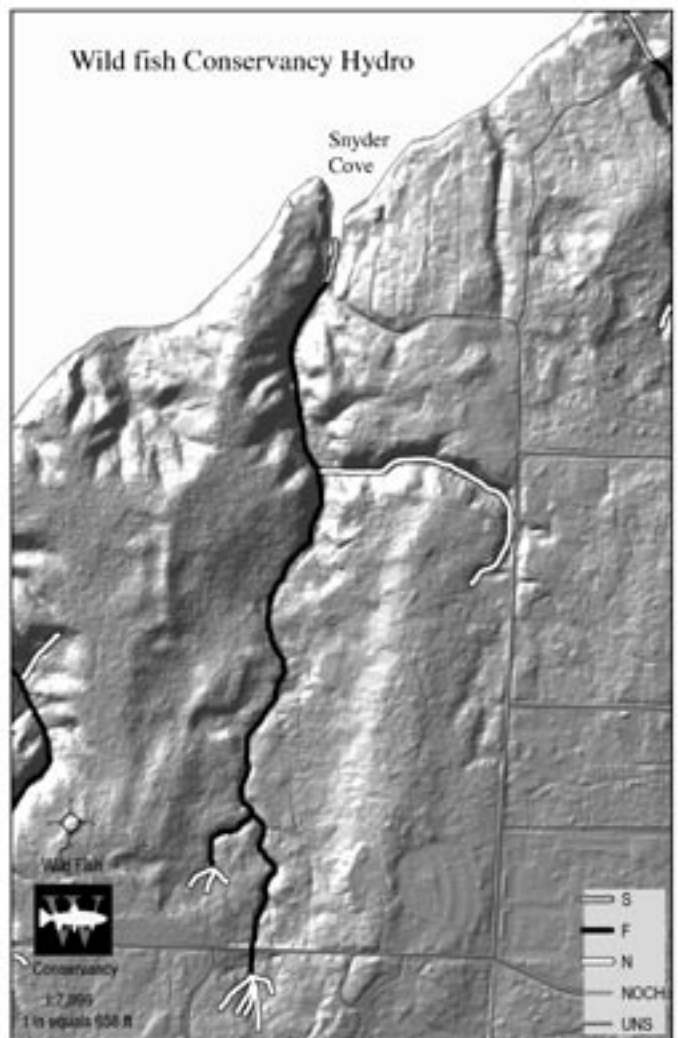
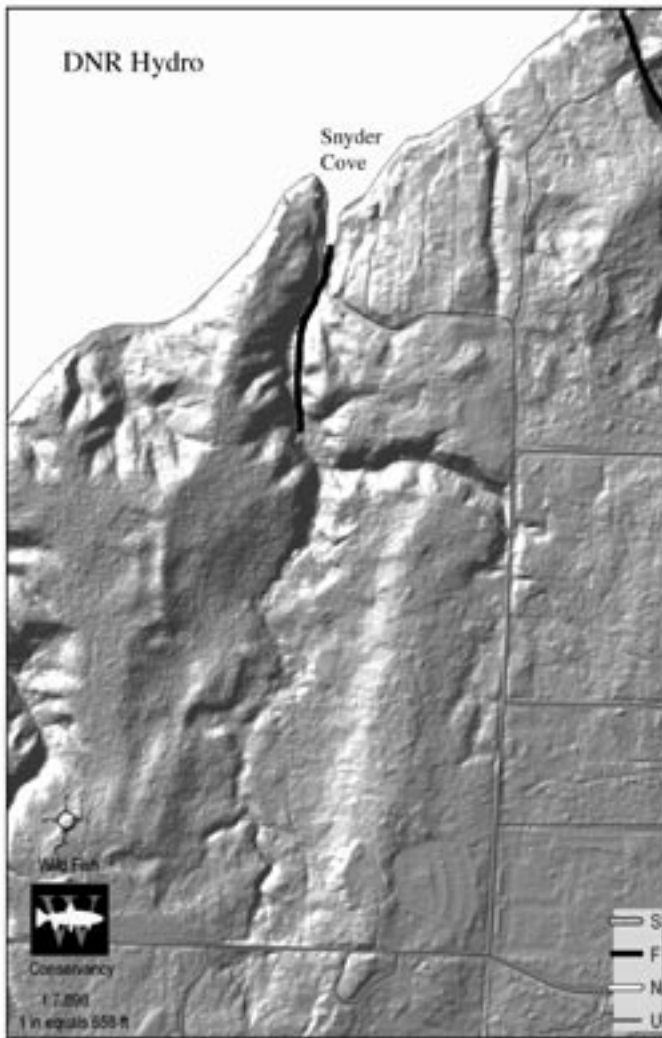
there is no comparable system to ensure timely updates in non-forestry areas subject to Growth Management Act planning and regulations. Likewise, county and local planning and conservation ordinances often rely on WDNR watertype maps, and often without adequate mechanisms for checking or correcting the 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	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 seepage 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

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. ◀

**“We cannot recover Puget Sound without a thorough and accurate inventory of the watersheds that feed it.”**

Canada's fisheries are having a much greater impact than previously understood; NOAA's new policy regarding hatchery-origin salmon, which should have caused the agency to revisit the need for mark-selective fisheries in Puget Sound; NOAA's approval of a recovery plan for PS Chinook, which should have triggered a re-evaluation of NOAA's "viable population" targets, and finally; data from the first several years of fishing under the harvest plan shows that the PS chinook populations most at risk are not improving, and indeed, remain at or below critical thresholds.

NOAA appointed a Technical Recovery Team, or TRT, to identify criteria for recovery of PS chinook. The TRT's preliminary recovery criteria were that there be two to four viable populations in each of five Puget Sound regions, and that the remaining populations improve from their current status. The target population levels NOAA used to evaluate harvest rates on PS chinook are inconsistent with the recovery criteria set by the TRT and now incorporated into the Puget Sound chinook recovery plan developed by Shared Strategy. The agency's own analysis shows that under the harvest plan, two of five regions will not make progress toward even a grossly deflated "current conditions" viability goal, and that key populations in other regions – such as the Cedar and Sammamish River populations in the Lake Washington basin, and the Skykomish River population in the Snohomish basin – will remain at risk.

Wild Fish Conservancy and its partners are seeking a determination from the court that NOAA's decision to approve the harvest plan was arbitrary and capricious, and violated section 7 of the ESA, by failing to ensure that the agency's actions would not appreciably reduce the likelihood of survival and recovery of Puget Sound chinook.

Wild Fish Conservancy hopes that this suit will help bring about escapement goals and harvest rates that are more consistent with ESA recovery goals. While the suit targets the management plan for Puget Sound fisheries, it could also influence the ongoing Pacific Salmon Treaty talks regarding Canada's harvest on the same salmon stocks. Briefing in the case began in April 2007, and a ruling is possible before the end of the year.

*Svend Brandt-Erichsen is a shareholder of Heller Ehrman LLP, located in the firm's Seattle office, with a practice focused on regulatory counseling and environmental litigation. He and his family make their home on Bainbridge Island. ➤*

of the methods and findings of the *west Whidbey Island nearshore juvenile fish-use assessment*, a two-year research project undertaken by the Wild Fish Conservancy in 2005 and 2006.

The project surveyed nearshore habitats on the west coast of Whidbey Island in areas that are not adjacent to the mouths of major Puget Sound rivers, and examined the role those habitats play in the lifecycle of migrating juvenile salmon. Wait shared the results of the past summer's extensive sampling effort, covering 60 nearshore sites in 60 days. The results of the extensive effort have shown significant correlations between the density of juvenile salmon and particular habitat variables related to landscape position, site structure, and landform.

Over 900 scientists, community leaders, policy makers, educators, and students attended the 2007 conference, held in Vancouver British Columbia, to see dozens of panel discussions and hundreds of presentations from researchers, managers, and policy makers from tribal, government, academic, commercial, and non-profit institutions. The conference is a joint effort of the Puget Sound Action Team and Georgia Basin Action Plan, and focuses on the transboundary regions of the Georgia Basin and Puget Sound. Micah Wait's presentation was well received and will be published online in the Conference Proceedings by summer 2007.

## **SEATTLE PUBLIC UTILITIES – FISH IN THE CITY**

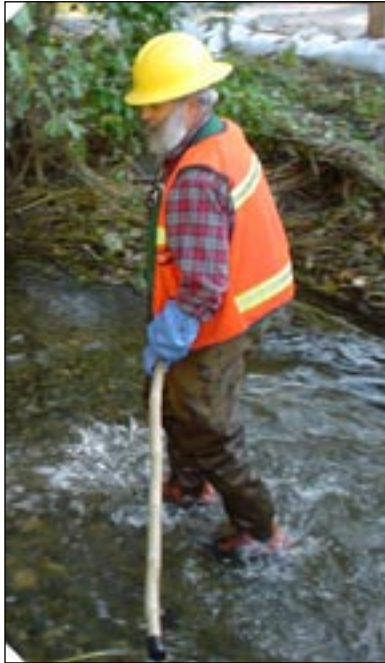
*Jamie Glasgow*

Wild Fish Conservancy is currently working with Seattle Public Utilities to synthesize and summarize seven years of physical and biological data regarding fish and fish habitat in five urban watersheds. In 1999, SPU began a series of systematic fish and fish habitat assessments in Thornton, Pipers, Longfellow, Taylor, and Fauntleroy Creeks. SPU recognized the value of using physical and biological data to direct surface and stormwater management strategies within the Seattle's streams, and contracted Wild Fish Conservancy to conduct annual surveys to collect and analyze fish and fish habitat data in the study streams.

SPU has used Wild Fish Conservancy data to identify and implement a variety of instream habitat improvement projects, address water quality and fish passage problems, and launch a significant effort to better understand the coho pre-spawning mortality phenomenon that affects several of Seattle's streams.

The report being developed by Wild Fish Conservancy and SPU will summarize the information gathered since 1999, and provide opportunities to improve how Seattle manages its watersheds while meeting drainage and fish-habitat needs. The report will also provide a baseline against which fish population trends and the impacts of SPU management decisions can be measured over time.

With the information provided by Wild Fish Conservancy, SPU is now working with NOAA Fisheries,



*Bill McMillan performs salmon, steelhead, and cutthroat spawning surveys in a Seattle stream. Photo by Jamie Glasgow.*

the US Fish and Wildlife Service, and other consultants that specialize in watershed processes. The systematic collection of fish and fish-habitat data to inform Seattle's management decisions sets an important precedent for cities throughout the Northwest.

Wild Fish Conservancy is proud to have been involved with SPU in the substantial on-the-ground data collection and

analysis efforts since 1999, and we look forward to many more years of providing the city with accurate information about the fish and habitats within Seattle's watersheds.

**BLACK LAKE DITCH FISH HABITAT ENHANCEMENT PROJECT**

*Jamie Glasgow*

The Black Lake Ditch is a man-made channel that drains Black Lake and surrounding wetlands to Percival Creek in Olympia. The ditch was constructed in 1922 and is co-managed by the City of Olympia and Thurston County. It is known to support cutthroat trout, chinook salmon, native sculpin and crayfish, and non-native sunfish and bass. It may also provide habitat for coho salmon and steelhead.

Black Lake Ditch lacks the instream habitat diversity and complexity that wild fish have evolved to rely upon.



*During summer 2006 WFC and the City of Olympia constructed four engineered logjams within Olympia's Black Lake Ditch. Photo by Jamie Glasgow.*

Wild Fish Conservancy and the City of Olympia installed log jams in the Black Lake Ditch just upstream of the Mottman Road culvert and within the City of Olympia's Black Lake Meadows regional stormwater treatment wetland facility. Black Lake Meadows is designed to provide passive recreational opportunities, manage stormwater, and protect fish and wildlife.

Four engineered log jams were installed during summer 2006 to increase instream habitat complexity, trap sediment, form scour pools, trap salmon carcasses to retain marine derived nutrients, and create and enhance summer rearing habitat, predation refuge, and high-flow refuge. Each structure consists of four to six key logs and five to eight rack logs. The log jams are closely associated with the stream bed so that they function both at high flows and summer low flows.

Since Black Lake Meadows park is frequented by the general public, the channel enhancement project has

significant public outreach and education opportunities. The project complements the 2001 replacement of the Mottman Road culvert and the City of Olympia's novel stormwater facility design. A trail network exists through the park; this trail system will likely be improved and extended within the next five years to provide viewing access to the log jams. The City of Olympia is currently developing a long-term management plan for the park – this fish habitat enhancement project will be an integral component of the plan, and interpretive trails and signs along the project reach will likely illustrate what was done, why, and how.

Funding for the project was provided by the National Fish and Wildlife Foundation's Community Salmon Fund, and through financial and technical support from the City of Olympia. All the large woody debris used during the project was provided by the City of Olympia, the result of a nearby road-widening effort. The project was designed by Wild Fish Conservancy and Anchor Environmental, L.L.C.. Wild Fish Conservancy will be monitoring the effectiveness of the log jams over time.

### **MAXWELTON CREEK FISH-PASSAGE AND SPAWNING SURVEYS**

*Mary Lou White*

In summer 2006 the Whidbey and Skagit Conservation Districts helped the local diking district modify a tidegate on Maxwelton Creek on Whidbey Island



*David Crabb, WFC Field Technician, surveying the mouth of Maxwelton Creek on the west side of Whidbey Island is controlled by a tide gate.*

to improve its hydraulic performance and improve fish passage to and from Maxwelton Creek. To collect data used to assess the effectiveness of new tidegate, in fall 2006 the Wild Fish Conservancy monitored adult coho and chum salmon returns to Maxwelton Creek, evaluating fish-passage at the modified tidegate, and surveying spawning activity in the creek.

Every week between October 20, 2006 and January 2, 2007, Wild Fish Conservancy field scientists surveyed spawning activity in index reaches with authorized access and characteristics favorable for salmon spawning. The index reaches were identified based on flow, substrate, and channel morphology characteristics observed during habitat surveys conducted by Wild Fish Conservancy on Maxwelton Creek in 2004.

Field crews recorded only a very few live-fish and redd observations in the primary spawning reaches. Only one live fish and two redds were observed in mainstem Maxwelton on the Outdoor Classroom property. In general, secondary index reaches where spawning seemed less likely were surveyed only once during 2006. No other live fish, redds, or carcass were observed in the mainstem of Maxwelton Creek. Salmon eggs and remnant salmon fragments (unidentified species) were observed within the Maxwelton Road right-of-way upstream of the Maxwelton tide-gate. Two redds were observed in Quade Creek, and one live fish and one potential carcass were reported by Quade Creek landowners.

The newly installed tidegate was examined during the surveys to determine if it was functioning properly. However, the tide-gate only opens at tides below approximately 5.0 ft., a condition that did not coincide with any of our surveys. The spawning and fish-passage data will be compiled with data collected in previous and upcoming years to measure any changes in the productivity of Maxwelton Creek.

### **WILD FISH CONSERVANCY'S SOUTH PUGET SOUND WATER TYPE ASSESSMENT**

*Jamie Glasgow*

Wild Fish Conservancy has completed the fieldwork portion of watertype assessments on Cooper and Dofflemeyer Points, west and east (respectively) of downtown Olympia. Correctly classifying watertype designations will ensure that fish habitats receive the protection they warrant. Channels that are mapped incorrectly, or that do not appear on regulatory maps at all, may not receive warranted protection. Without accurately



Frank Staller, WFC Field Technician documenting an estuarine impoundment in South Puget Sound. Photo by Jamie Glasgow.

identifying where the fish and their habitats are, neither can be effectively protected nor included in basin-wide recovery planning efforts.

Project objectives are fivefold:

- Correct the misclassification of watertype in the study watersheds.
- Correctly map previously unmapped and incorrectly mapped stream channels.
- Provide salmon species-specific distribution data, instream and riparian habitat data, and fish passage data to assist with basin wide restoration project identification and prioritization efforts.
- Evaluate the type and extent of water type designation inaccuracies that exist in South Puget Sound.
- Submit watertype results directly to WDNR to ensure that regulatory maps are updated; make information available to interested agencies and the general public via an interactive web-based GIS (see <http://www.wildfishconservancy.org/maps.shtml>)

Wild Fish Conservancy mapped and classified 68 separate watersheds, each with a mouth at saltwater. Many of these watersheds meet the physical and/or biological criteria to receive protection as fish-bearing waters. Wild Fish Conservancy documented what appears to be an isolated population of native Olympic Mudminnow (*Novumbra hubbsi*, a State Species of Concern) in the upper Green Cove Creek watershed. Other species encountered during the surveys include coastal cutthroat trout, coho salmon, chinook salmon, stickleback, prickly sculpin, and brook lamprey. Surveyors documented a juvenile chinook salmon in one very small watershed on the north end of Dofflemeyer Point, and observed coho smolts of hatchery origin in the same and in an adjacent watershed, at locations where the channel was no more than three feet wide. The motivation of these fishes' choice of habitats is as yet unknown.

In fall 2006, Wild Fish Conservancy was awarded additional funding from the Salmon Recovery Funding Board to continue the watertype assessment of South Puget Sound by correcting the misclassification of watersheds draining Johnson Point in North Thurston County, and sixty prioritized watersheds in Mason County. 🐟

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### ***16th Annual Wild Fish Soiree continued from page 4***

Again this year Southern Chile Expeditions is donating an eight-day, seven-night expedition for two at Yan Kee Way lodge, in one of the most beautiful and unspoiled places left on earth. Yan Kee Way offers four-star accommodations, a remote, spectacularly beautiful wilderness setting, and incredible outdoor adventure opportunities, including wildlife viewing, trekking, riding, rafting, and trophy fly-fishing.

Admission to the Wild Fish Soiree is \$100 per plate and includes a hosted wine and hors d'oeuvre reception during the silent auction, a gourmet dinner, wine, and a one year Wild Fish Conservancy membership. You may have already received your invitation to this year's event in the mail; if you don't receive it soon, don't hesitate to contact us for details. We look forward to seeing you at this very exciting soiree!

For more information or to make a donation to the 2007 Wild Fish Soiree & Benefit Auction please contact Tyler Cluverius at [tyler@wildfishconservancy.org](mailto:tyler@wildfishconservancy.org), call 425-788-1167, or visit us online at [www.wildfishconservancy.org](http://www.wildfishconservancy.org). 🐟

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### ***Rescuing an Ecosystem Out of Balance continued from page 14***

update on our efforts to improve fisheries management in Puget Sound, and reduce harvest impacts that may be jeopardizing the recovery of PS chinook.

Saving Puget Sound won't be easy. No large-scale aquatic restoration effort – think the Everglades, Chesapeake Bay, the Great Lakes – has been an unqualified success. But business-as-usual will result in a future Puget Sound that is more degraded than at present. We may only have the opportunity to protect and restore this national treasure for a limited-time. Wild Fish Conservancy is working now towards a restored, functioning, and balanced Puget Sound ecosystem. 🐟

# We Have A Winner!

## Wild Fish Conservancy Canoe Raffle

**Tyler Cluverius, Wild Fish Conservancy Outreach and Development Coordinator**

Brenda Osterhaug of Seattle won the much anticipated Wild Fish Conservancy canoe raffle. She is now the proud and delighted owner of the beautiful Chestnut Canoe built and donated by long-time Wild Fish Conservancy supporters Bill and Trudy Kindler.

Young Leo Delgadillo of Duvall volunteered to draw the winning ticket at the Wild Fish Conservancy Store in downtown Duvall on April 2.

Valued at over \$3000, the gorgeous fifteen foot canoe was donated in May 2006 to support the Wild Fish Conservancy's science, education and advocacy initiatives to recover and conserve the Northwest's wild fish ecosystems. The beautiful hand-built boat has been a marvelous fundraising tool. The Wild Fish Conservancy sold nearly 1,700 tickets for the canoe raffle, raising over \$7000!

Bill hand laid the canoe from strips of reclaimed western red cedar and trimmed it in Honduras mahogany, Alaskan yellow cedar, and Peruvian walnut. It features natural, hand caned seats and brass fittings. Adapted from an early 20<sup>th</sup> century model known as the Bob's Special, the meticulous construction of the boat is as efficient as it is handsome, requiring only two 2x6's for the entire hull. The ash paddles accompanying the canoe were hand made by the Shaw and Tenney Company of Orono, Maine. Shaw and Tenney have been making paddles since the 1850's and



*Brenda Osterhaug of Seattle, winner of the 2007 canoe raffle. Photo by Tyler Cluverius.*

are regarded by many as the gold standard.

"I was just stunned when I got the call to tell me I had won," says Brenda. "The canoe is even more beautiful than I remembered and the workmanship is amazing. I am planning to get it in the water and start paddling this weekend!"

We offer our congratulations to Brenda and wish her years of happy paddling. We also want to offer our appreciation to Bill and Trudy Kindler, and to everyone who participated and helped make the raffle such a big success. ❖

### *In Memoriam*

Wild Fish Conservancy gratefully acknowledges donations made in memory of

*Dan Webster*

*Christopher T. Jansen*

*Mr. Robert Paul Nielsen*

These memorial gifts will directly fund Wild Fish Conservancy's advocacy, research, and restoration initiatives.

# Thank You

*A special thank you to the following donors who helped make the 2006 Wild Fish Soiree and Benefit Auction a success. Wild Fish Conservancy respects and appreciates their commitment and generosity. Please remember them when making future purchases.*

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Ken Winkleblack  
Whitetail Fly Tying  
Willows Lodge

(See page 4 for details)

16<sup>th</sup> Annual

*Wild Fish Soiree*  
&  
Benefit Auction

*Saturday, May 19th at the Chateau Ste. Michelle Winery*

Photo by Kurt Beardslee.



Wild Fish Conservancy  
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