Jamie Glasgow, M.Sci.
Director of Science and Research
Preserve, Protect and Restore Wild Fish and their Habitats

Research, Restoration, Advocacy
Recover the Abundance and Diversity of PNW Native Fishes

Restore Important Habitats & Watershed Processes.

AND

Protect Existing Habitats and Processes from Further Degradation (Effective and Responsible Resource Management).

Both actions are needed
Recover the Abundance and Diversity of PNW Native Fishes

Restore Important Habitats & Watershed Processes.

AND

Protect Existing Habitats and Processes from Further Degradation (Effective and Responsible Resource Management).

AND

Harvest and Hatchery Reform...
Snoqualmie Watershed
March 9, 2007
WATER TYPING

A stream classification system used to regulate land-use around streams.

WHERE ARE THE FISH AND THEIR HABITATS?
### WA Department of Natural Resources Water Types

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Buffer Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type S (1)</td>
<td>Shorelines (SMA)</td>
<td>Large</td>
</tr>
<tr>
<td>Type F (2,3)</td>
<td>Fish Bearing</td>
<td>Medium</td>
</tr>
<tr>
<td>Type N (4,5)</td>
<td>Non Fish-Bearing</td>
<td>Small or none</td>
</tr>
<tr>
<td>Type U (9)</td>
<td>Unclassified</td>
<td>V. small or none</td>
</tr>
</tbody>
</table>

*WAC 222-16-031*
WATER TYPING

Originally developed by WDNR to protect streams on state forest lands.

Subsequently adopted by most local governments in Washington to protect critical areas from adjacent land-use.
<table>
<thead>
<tr>
<th>STREAM TYPE</th>
<th>CURRENT BUFFER</th>
<th>STANDARD RIPARIAN HABITAT AREA WIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type S streams <em>(currently Type 1)</em></td>
<td>100’</td>
<td>250’</td>
</tr>
<tr>
<td>Type F streams <em>(currently Type 2)</em> 20 feet or greater in width</td>
<td>100’</td>
<td>250’</td>
</tr>
<tr>
<td>Type F streams <em>(currently Type 3)</em> less than 20 feet wide</td>
<td>100’</td>
<td>200’</td>
</tr>
<tr>
<td>Type Np and Ns streams <em>(currently Type 4 and 5 respectively)</em> draining to Type S or F streams, Category I-III wetlands, or ponds or lakes protected under Section 17.15.840</td>
<td>50’</td>
<td>200’ within 500’ feet of a Type S or F stream, 100’ elsewhere</td>
</tr>
<tr>
<td>Type Np and Ns streams draining directly to Puget Sound</td>
<td>50’ (Type 4)</td>
<td>100’</td>
</tr>
<tr>
<td></td>
<td>25’ (Type 5)</td>
<td></td>
</tr>
<tr>
<td>Other streams not listed above, including streams without a surface connection to other waters</td>
<td>100’</td>
<td>100’</td>
</tr>
</tbody>
</table>
17.35.660 Classification.

Streams are classified Type 1-5 for critical area protection purposes based on the water typing criteria in WAC 222-16-030 as adopted by the state in June 1993 and summarized in Table 1 below. [Ord. 1170B, 2000; Ord. 1157, 1998; Ord. 1150 § 4.2(B), 1996]
a. Riparian Priority Habitat. Areas extending outward on each side of the stream (as defined in Section 40.100.070, Definitions) from the ordinary high water mark to the edge of the one hundred (100) year floodplain, or the following distances, if greater:

1. DNR Type S waters, two hundred fifty (250) feet;
2. DNR Type F waters, two hundred (200) feet;
3. DNR Type Np waters, one hundred (100) feet;
4. DNR Type Ns waters, seventy-five (75) feet.

Water types are defined and mapped based on WAC 222-16-030, (Forest Practices Rules)
Critical Area Protection: Buffers and Best Available Science

The standard protection for Wetland Areas and Fish and Wildlife Habitat Conservation Areas proposed in this Grays Harbor County Critical Area Protection Code is, in large part, based on the Washington State Department of Ecology’s classification and rating system for wetlands, used in conjunction with the United States Department of the Interior’s National Wetland Maps and the Washington State Department of Natural Resources Stream Type Maps.
Regulatory maps that guide stream protection ordinances are **INACCURATE**

- The maps frequently underestimate the distribution of fish and fish habitats.
- Many streams are incorrectly mapped or are not on the maps at all.

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Misidentified fish habitats are not receiving the protection they warrant under existing laws.
2009-11 Budget Reductions

Overall, the department’s current staff of 1,550 employees will be reduced by approximately 10.5 percent. The size of the budget reduction will lead to significant service reductions.
Landscape conservation planning:
Local habitat assessment and related planning services and technical assistance to county planning departments, sub-area planning groups, and nonprofit entities will cease. Capacity also will be lost for development of landscape planning management recommendations for local planners.
When Riparian Corridors Are Not Adequately Protected…

**Altered hydrographs** - stormflows increase in magnitude and frequency, and summer baseflows reduce.

**Increased erosion** - aggravated by loss of riparian vegetation and an altered hydrograph, channels downcut and mobilize large amounts of fine sediments.

**Increased water temperatures** – loss of riparian habitat increases summer water temps.

**Reduced water quality** – loss of ‘filter effect’ of riparian corridor, overland flow, sediment delivery via road network.

[ ESA and CWA Implications ]
Working with federal, state, and local agencies and tribes to accurately map streams so they can be adequately protected.
Systematic Water Type Assessments

WRIAs 02, 07, 09, 13, 14, 15, 17, 22-23, 28.
Cooper Point, Thurston County
<table>
<thead>
<tr>
<th></th>
<th>DNR</th>
<th>WFC</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stream Miles</td>
<td>16.2</td>
<td>28.1</td>
<td>74%</td>
</tr>
<tr>
<td>F Miles</td>
<td>9.5</td>
<td>16.3</td>
<td>71%</td>
</tr>
<tr>
<td>N Miles</td>
<td>5.5</td>
<td>8.3</td>
<td>51%</td>
</tr>
<tr>
<td></td>
<td>DNR</td>
<td>WFC</td>
<td>% Increase</td>
</tr>
<tr>
<td>----------------</td>
<td>-----</td>
<td>-----</td>
<td>------------</td>
</tr>
<tr>
<td>Stream Miles</td>
<td>0.2</td>
<td>1.4</td>
<td>600.0%</td>
</tr>
<tr>
<td>F Miles</td>
<td>0.2</td>
<td>0.8</td>
<td>300.0%</td>
</tr>
<tr>
<td>N Miles</td>
<td>0.0</td>
<td>0.5</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>DNR</td>
<td>WFC</td>
<td>% Increase</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------</td>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td>Acres Protected</td>
<td>5.31</td>
<td>25.23</td>
<td>375%</td>
</tr>
</tbody>
</table>
Project Field Elements

Correct water type classification per WAC 222-16-031 and Section 13 of the FPBM.

- Characterize channel and riparian condition, water temperatures, and instream features that may affect fish distribution. Document with photos and GPS.

- When fish are brought to hand, collect species, length, and condition data. Document with photos and GPS.

- Using GPS, correctly map the course of incorrectly mapped and unmapped stream channels.
Project Products

GIS for:
- Fish Species Composition and Distribution
- Ground-truthed watertype
- Habitat and instream feature characterization
- Accurate Stream channel locations (GPS and LiDAR)

Interactive web-based interface

Deliver all data to WDFW, WDNR, affected counties, cities, Tribes, and interested Programs.

Public Presentation of Results
Project Results

• Improved regulatory protection of stream habitats

• Prioritized list of restoration and protection opportunities

• Strengthening of salmon recovery Strategies and Plans
Puget Sound Water Type Assessment: 2005-2007

Interactive Map by Umbrella Consulting

Enter an Address
Find Location
View Legend

15629 Main Street NE, P.O. Box 402, Duvall, WA 98019
Phone: 425-788-1167
info@bridgepointweb.com

The interactive map to the right allows you to view detailed stream survey and watertype data.

To zoom: double-click the map, holding SHIFT while drawing a zoom box, or use the navigation tools at the top left of the map.

To pan: use the arrows at the top left, or click-hold-drag the mouse.

Additional data layers are available by clicking the '+' symbol at the top right of the map.

When you first click on the map, this help screen will disappear, and the results of the closest survey collection point to your click will be displayed. You may then click on the images in the result, or the 'watertype details' link, to view additional information.

Enter an Address
Find Location

View Legend

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Enter an Address
Find Location
View Legend
Interactive Map by Umbrella Consulting

Powered by Google
Map data ©2008 Tele Atlas - Terms of Use

15629 Main Street NE, P.O. Box 402, Duvall, WA 98019
Phone: 425-788-1167
info@4life水资源guy.org
Point Details

Detailed results for Stream DP02

Point ID: 319
Date: 5/2/2006
Reach WW (ft): 5
Reach BFW (ft): 7
Reach Gradient (%): 3

Notes: The culvert outlet and plunge pool at Boston Harbor Rd NE. Several cutthroat trout were observed and netted at the culvert outlet. This culvert is a partial fish passage barrier. Fish were observed above this culvert at the time of the survey.

Point ID: 319
Date: 5/2/2006
Reach WW (ft): 5
Reach BFW (ft): 7
Reach Gradient (%): 3

Notes: The juvenile cutthroat trout netted at the culvert outlet and plunge pool at Boston Harbor Rd NE. Several cutthroat trout were observed and netted at the culvert outlet. This culvert is a partial fish passage barrier. Fish were observed above this culvert at the time of the survey.

Point ID: 319
Date: 5/2/2006
Reach WW (ft): 5
Reach BFW (ft): 7
Reach Gradient (%): 3
### Watertype Details

<table>
<thead>
<tr>
<th>Stream Name: DP02</th>
<th>County: Thurston</th>
<th>Watershed: 02 Mission Creek</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stream ID: DP02</td>
<td>Survey Date: 5/3/2006</td>
<td>Crew: White-Staller</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey Start Point: Township: Range: Section:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey End Point: Begin survey at the tidewater mouth on Budd Inlet in Puget Sound and end survey at a headwater source in an extensive wetland near Yew Avenue NE.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Previous Stream Type: 3</th>
<th>New Stream Type: 3</th>
<th>Avg. Wetted Width (ft): 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. Bankfull Width (ft): 8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substrate Type</th>
<th>Boulder: 0</th>
<th>Cobble: 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedrock: 0</td>
<td>Sand: 40</td>
<td>Mud: 10</td>
</tr>
<tr>
<td>Gravel: 40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Pools: 30</th>
<th>Shaded: 70</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Riparian Cover</th>
<th>Conifer: abundant</th>
<th>Deciduous: Abundant</th>
<th>grass/ Shrubs: Abundant</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Barrier Type: undefined</th>
<th>Barrier Height: 1.5</th>
<th>Barrier Location: mouth</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Woody Debris</th>
<th>Logs: Moderate</th>
<th>Type: Both</th>
<th>Rootwad: Moderate</th>
<th>Type: Both</th>
<th>Limbs: Abundant</th>
<th>Type: Both</th>
<th>Brush: Abundant</th>
<th>Type: Both</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmonid: undefined</td>
<td>Steelhead: No Obsv.</td>
<td></td>
</tr>
<tr>
<td>Other: No Obsv.</td>
<td>Sculpin: undefined</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Stream DP02 (Mission Creek) was previously classified as fish-bearing (Type 3) habitat from the mouth upstream to Pine Avenue NE, and non fish-bearing habitat above the roadway. Based on the physical characteristics, we extended the “F” (Type 3) habitat to include the entire length of Mission Creek, from the tidewater mouth on Budd Inlet in Puget Sound upstream to the headwaters in an extensive forested wetland in the vicinity of Yew Avenue NE. A 3 ft. diameter pre-cast concrete culvert crossing an abandoned road at the mouth of the channel is a barrier to fish passage, with a 1.5 ft. drop into the inlet from a flow-control structure consisting of metal brackets holding wooden boards that no longer functions to dam the stream. The channel above the culvert splits and braids through the former pond - now a grassy meadow extending upstream in the city of Olympia’s Priest Point Park - to a culvert...
Systematic Water Type Assessments

Mason County
Mason Watertype Assessment Summary

2007- Ongoing:

- 30,000 acres
- 56 watersheds
- 112 miles of stream

<table>
<thead>
<tr>
<th>MASON</th>
<th>Stream Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA DNR</td>
<td>106.8 miles</td>
</tr>
<tr>
<td>WFC</td>
<td>112.7 miles</td>
</tr>
<tr>
<td>Δ</td>
<td>5.9 miles</td>
</tr>
</tbody>
</table>

www.wildfishconservancy.org
Systematic Water Type Assessments

Kitsap County
Cowling Cr.
### Cowling Creek, Kitsap County

<table>
<thead>
<tr>
<th>Type</th>
<th>DNR</th>
<th>WFC</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>0</td>
<td>0.12</td>
</tr>
<tr>
<td>F</td>
<td>1.42</td>
<td>5.46</td>
</tr>
<tr>
<td>N</td>
<td>1.06</td>
<td>5.4</td>
</tr>
<tr>
<td>U</td>
<td>1.84</td>
<td>1.24</td>
</tr>
<tr>
<td>Total</td>
<td>4.32</td>
<td>12.22</td>
</tr>
</tbody>
</table>

The DNR Water Type maps missed 66% of this watershed.

www.wildfishconservancy.org
Many of the Stream / Wetland geographic data typically used by WA state and local governments to identify and protect fish habitats are inaccurate.

DNR Watertype (FPARS)
Salmonscape
Dept. of Ecology Hydro
Local gov’t GIS
No Net Loss?
Responsible Forest Practices?
Responsible Development?
Responsible Growth Planning?
Responsible Restoration Planning?
Recovery of T&E Species?

The rules are in place but their effectiveness is compromised because the maps that drive their implementation are inaccurate…
For More Information:

Jamie Glasgow, Director of Science and Research
360/866-4669, jamie@wildfishconservancy.org
www.wildfishconservancy.org
“...a listed species could be gradually destroyed, so long as each step on the path to destruction is sufficiently modest”

Judge Sydney R. Thomas, 9th U.S. Circuit Court of Appeals
April 2007
From: KNUTZEN, KRIS (DNR)  
Sent: Thursday, July 09, 2009 2:08 PM  
To: Corina Hayes  
Cc: jamie@wildfishconservancy.org  
Subject: RE: Stream typing

Corina,  
The most recent and accurate data available is on the Wild Fish  
Conservancy site at http://www.wildfishconservancy.org/maps  
Kris Knutzen  
WA DNR

From: Corina Hayes [mailto:Hayesc@co.thurston.wa.us]  
Sent: Wednesday, July 08, 2009 3:49 PM  
To: KNUTZEN, KRIS (DNR)  
Subject: Stream typing  
The property is located off of Grayhawk Ln to the West of Tolmie State  
Park the parcel # are 11922410000 and 11922140000. there are a couple of  
streams mapped in this area on the Puget Sound Water Type Assessment -  
Also previously mapped as and N onsite and F leading into Tolmie State  
Park.  
Corina Hayes  
Assistant Planner  
Thurston County Development Services  
Planning & Environmental Section
Conservation Caucus Recommendations

Make Water Type Modification Forms mandatory not “voluntary” for all typed waters (for stream typing “upgrades” and “downgrades”). DNR’s CM data indicate that all typed waters within FPAs are NOT being correctly validated in the field in accordance with WAC 222-16-031.

Increase DNR enforcement of water typing rules under WAC 222-16-031. Some DNR compliance monitoring funds were diverted to Ecology to help with water typing (Ecology memo 2008 in packet), but successes are not born out by DNR Compliance Monitoring results.
Update DNR website and restore and revise the water typing “scenarios” that were posted as guidance when the Fish Habitat Model derived Basemaps were first rolled out (see Conservation Caucus memo to Lenny Young 2008 in packet).

Require landowners to certify they are not relying on DNR Resource and Water Type Basemaps for water type classifications (e.g. F, Np, Ns, U) to ensure that all waters have been correctly typed in accordance with WAC 222-16-031 prior to submitting an FPA.
Where available, require the use of LiDAR (Light Distance and Ranging) as a water typing screening tool. LiDAR is much more accurate for identifying, locating and depicting channel conditions than the DNR modeled Basemaps.

Reprioritize Policy’s task list by moving water typing back to the top. Clearly defining the extent of fish habitat, not simply fish presence, is part of the FP HCP. Develop board manual guidance accordingly.