

Washougal River Assessment Final Report

Underwood Conservation District
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A. BRIEF OVERVIEW & NEED

There is recognized need for work to improve habitat conditions for salmon and steelhead in the Washougal River watershed, and a number of past and current projects to do so in the upper reaches and tributaries. While these are important efforts, there remains some need for identifying opportunities in the more urbanized and populated lower reaches of the river – reaches characterized by lawns and landscaping, heavy recreational use and fishing, and encroaching human development. This need is wide-ranging in scope, and this assessment was carried out to begin addressing that need. We have identified nearly 20 projects that could be helpful in supporting and sustaining salmon, steelhead and other fish and wildlife in the Washougal River watershed.

The motivating force of this assessment is a goal to develop on-the-ground understanding of current conditions, build initial relationships with relevant landowners, and identify actionable projects to improve water quality and fish habitat conditions. The assessment focuses on the first 25 river-miles of the Washougal River mainstem, from the confluence with the Columbia River to just above Dougan Falls, an area marked by a growing urban and rural residential populations. This assessment was not scoped to be the final word on conserving and improving Washougal River habitat, but rather a way to create a positive conversation and some momentum toward those, developing a working set of data and projects to inform activities going forward. The assessment has yielded the UCD Washougal River Assessment geodatabase, a shareable database of geospatial information for use and further analysis.

This assessment does not create an authoritative action plan, nor does it guarantee an ability for public agencies and private groups to implement the proposed projects. However, this project provides information and guidance toward some potential habitat-supportive actions. It is our hope that this work helps to inform the restoration community in taking productive steps toward renewing watershed health and habitat on the lower Washougal River.

B. WATERSHED CONDITIONS & CONCERNS

The Washougal River watershed (or subbasin) was historically productive, hosting runs of Coho salmon, fall Chinook, Chum, and summer and winter steelhead. Today, though, many of these are struggling, threatened, or endangered. The watershed is home to a growing urban population and significant suburban and peri-urban development. Between 2010 and 2020, Clark County grew by 18 percent, according to the US Census, and the City of Washougal by 21 percent. With increasing human population pressures, the watershed retains a diverse landscape with large areas of forested hills, agriculture, rural residential lots, and urban areas. The lower reaches of the Washougal River are characterized by a mixed landscape of rural residences, patches of forest, and the City of Washougal. The *Salmon-Washougal & Lewis Watershed Management Plan* notes (Lower Columbia Fish Recovery Board, 2006) that city growth and “suburban development in the lower Washougal mainstem has significantly altered and degraded watershed processes and habitat conditions.” That report also outlines the Washougal River system’s lower, middle, and upper reaches’ importance for various salmonid runs. The lower Washougal mainstem is highlighted as “critically important” for Chum and fall Chinook spawning, and for hosting developing fry populations. The report’s authors write that, “Riparian and floodplain functions are degraded in these areas due to streamside development and channelization features associated with residential/urban development, agriculture, and roadways. Needed habitat measures in the lower mainstem will involve protection of remaining functional habitat, riparian restoration, re-establishing connections between the stream

channel and floodplain areas, storm water controls, and measures that address the potential impacts from expanding urban and suburban development around Washougal and Camas.”

While this assessment did not seek to test those suggested habitat improvements, our observations lead us to substantially similar views. Looking at stormwater impacts was beyond the scope of this assessment. The focus of this work was to consider potential and feasible habitat improvements in the matrix of public and privately owned parcels along the lower and middle mainstream reaches of the Washougal River.

Understanding previous watershed-scale analyses and historical impacts informed our work. And the impacts have been manifold and dramatic, including past land-use practices such as splash-damming, the severe Yacolt Burn wildfires of 1902, and subsequent aggressive salvage logging. Current land uses have left the riparian area a patchwork of second- or third-growth forest, residences, small farms, and urban areas. Large areas of river frontage in the lower reaches are divided into narrow residential lots, often with home landscaping and lawns running down to the river. Roadways border much of the river up to RM 22. These contribute to a constrained river, a lack of riparian cover in areas, invasive species, easily-accessed fishing and other trails, and convenient access to “clean up” the river through removal of trees and logs. The result is a lack of instream wood or logjams in the lower river, few active side channels, and an overall simplification of riverine and riparian salmon-supporting habitat.

And yet, salmon and steelhead persist. They are a small proportion of the historic salmon runs, but they persist. They persist and get hooked by fishermen, sometimes half a dozen at a time (UCD observations, autumn 2021), return to the hatchery, and leap at cascades leading to tributaries.

C. SUMMARY OF GIS WORK

Available data from state and local resources was compiled at the watershed scale to better understand watershed characteristics and potential limitations. Datasets included physical (e.g., LiDAR, hydrology, transportation, water quality, previous project locations), biological (e.g., fish distribution and use) and political components (e.g., parcels, land use zoning, priority ranking). Synthesis of the data also resulted in layers with representation of canopy height and projected bankfull stream levels. (See 2.1 Annotated Bibliography and 2.3 Desktop Analysis for more information.)

This assessment included the completion of a modest, targeted field survey component. In order to prioritize areas for potential field survey, we considered the following elements:

Slope (seeking out areas that had identifiable floodplain, and avoiding very canyonized reaches), access (landowner permissions and longest available stretches with permission, any previous relationship or project work, physical feasibility of getting in/out of the survey reach), priority reach status (focus on high-priority EDT tier ranking, 303 listing), and location in the watershed (sites in upper, mid, and lower watershed).

Multiple short reaches were selected from the upper, mid, and lower watershed areas based on a visual assessment of the field survey criteria. Outreach mailers were sent to 68 landowners in the identified reaches to gain permission for field surveys and landowners where relationships existed already were contacted directly.

The 18 potential projects identified and field survey data for 22 sites were added to the geodatabase after field work was completed.

D. SUMMARY OF FIELD SURVEY FINDINGS

After requesting landowner access throughout the project area, UCD technicians accessed more than 20 sites during the 2021 field season. We identified 18 projects in the lower Washougal River mainstem that were feasible and had potential for positive benefits to the salmon and steelhead populations. Our criteria for identifying projects included:

- reasonable **physical access** (e.g. no helicopter log-placement in the heart of the city);
- a **potentially willing landowner**, preferably either a public entity or a private landowner with a stated willingness to discuss such work;
- be **cost-effective** and likely to be of a modest investment to accomplish;
- have a high **likelihood of improving salmonid habitat**;
- and appear to be **likely to persist** for many years.

In other words, the projects identified and included in this report are the kinds of projects likely to be implemented by UCD or other public agencies, and to be both beneficial to stream ecology and supported by funders. So for example while the removal of adjacent roadways may be beneficial to the river's ecological function, we deemed projects of that scale, cost, and human impact unfeasible. Similarly, there are probably no "Stage 0" project opportunities in the lower and middle reaches of the Washougal River watershed, at least that we could identify.

We have identified 18 potential projects we believe meet the five criteria outlined above. We stress that these are potential projects in our professional judgement, that would also benefit from professional peer review and technical input. In addition, of course, it is critical to gain landowner understanding and permission for these project concepts to advance. Also, this assessment is a non-exhaustive look at the lower 22 river-miles of the Washougal River due to limited funding and time, and to limited landowner permission to access the river via private property.

The 18 projects are discussed below by category, namely: outreach/regulatory; riparian vegetation; instream habitat; and, as a stand-alone project, Schmid Park. Projects that involve both suggested riparian vegetation management and instream habitat features are listed as instream habitat. Schmid Park is called out in this list for being perhaps the most ambitious project in terms of scale and cost, but also the most valuable in terms of habitat improvement, watershed location, benefits to both fish and human residents – and despite its size, among the most feasible of the projects due to ready access and public ownership.

The following shows the list of identified projects. Project descriptions and conceptual maps are located in Appendix A.

Project Category	Project Name	Project Elements	Lat / Long	River Mile	Ownership
Instream Habitat	River-Mile 12 Bend Habitat Complexity	Habitat Enhancement & Complexity w/ LWD	45.610496, -122.246050	12.2	private
Instream Habitat	Camas Greenway - Small Island	Habitat Enhancement & Complexity w/ LWD	45.585247, -122.387613	1.0	public
Instream Habitat	Camas Greenway - Large Island	Habitat Enhancement & Complexity w/ LWD	45.586097, -122.384457	1.17	mixed (mostly public)
Instream Habitat	River-Mile 2.85 Boulders	Habitat Construction & Enhancement w/ Boulders	45.583659, -122.349567	2.85	private
Instream Habitat	River-Mile 2.85 Side Channel	Habitat Construction & Enhancement w/ Side Channel Creation	45.584793, -122.349717	2.85	private
Instream Habitat	Salmon Falls Island Complexity	Habitat Enhancement & Complexity w/ LWD	45.613929, -122.204694	14.75	private
Instream Habitat	West Fork Confluence Complexity	Habitat Enhancement & Complexity w/ LWD	45.612429, -122.218801	14	private
Instream Habitat	Natural Area Swimming Hole Enhancement	Habitat Enhancement & Complexity w/ LWD	45.621282, -122.268586	10.45	public
Instream Habitat	Weir Site LWD	Habitat Enhancement & Complexity w/ LWD	45.618249, -122.255336	11.4	mixed
Instream Habitat	Hard Scramble Creek Habitat Complexity and Passage	Habitat Enhancement & Complexity w/ LWD	45.679175, -122.132937	22.95	private
Outreach & Regulation	In-Town Fishing Improvements	Fishing & Regulation	all	0 - 3	mixed
Outreach & Regulation	Hathaway Park Boat Ramp Outreach	Signage & Outreach	45.583766, -122.344272	2.4	public
Outreach & Regulation	Riparian Resident Mailer	Outreach & Education	all	0 - 3	private
Riparian Vegetation	Washougal Japanes Knotweed Control	Riparian Vegetation Management, Weeding and Replanting of Natives	all	all	mixed
Riparian Vegetation	River Bend Island Enhancement	Riparian Vegetation Management, Weeding and Replanting of Natives	45.588740, -122.369365	1.8	public
Riparian Vegetation	3rd Avenue Bridge Bank Planting	Riparian Re-vegetation Along Riverbank	45.587661, -122.371348	1.75	private
Riparian Vegetation	River-Mile 2.85 Riparian Planting	Riparian Re-vegetation Along Riverbank	45.584793, -122.349717	2.85	private
Schmid Park	Schmid Park Side Hannel Habitat Enhancement	Habitat Enhancement & Complexity w/ LWD, Side Channel Construction, Revegetation & Outreach	45.585846, -122.3399648	3.45	public

E. NEXT STEPS & RECOMMENDATIONS

This lower Washougal River habitat assessment has produced updated geo-spatial habitat data, renewed landowner contacts and provided a holistic view across the landscape, considering fish habitat, property ownership, and infrastructure constraints. Any interested public agency, non-profit, or landowner could review this project list and, with appropriate technical expertise, permitting and funding, work to bring positive change to watershed health and habitat.

As our next step, we will share our findings with locally-engaged agencies, governments and landowners. With relevant entities and individuals, including fish biologists, conservation practitioners, and public land stakeholders, we suggest the formation of a watershed forum aimed at reviewing, refining, strategizing, and collaborating on these projects.

Capacity and funding for project implementation has been limited and competitive, but modest and strategic habitat investments can prove immensely worthwhile. This assessment itself exemplifies what can be done with limited resources. This relatively minor study has yielded a range of potential outreach and habitat projects that could improve stream health, riparian function and shading, and fish habitat conditions – more than enough work for any agency for years to come.

Meanwhile, throughout the Washougal River watershed, there is much more landowner outreach and engagement to be done, much more habitat to assess, including the tributaries, more projects to identify, and a necessary careful analysis of those projects. Areas that could benefit from further assessment include:

- Confluence with the Columbia River, where potential habitat complexity and cover projects would provide important fish refuge;
- Little Washougal River, where dairies and other agricultural activities merit activities like riparian buffers;
- Canyon Creek, where floodplain and side channel habitat may be improved with LWD.

A more ambitious investment in a whole watershed assessment would be valuable for this comprehensive approach.

For now, the results of this assessment show that there is plenty of valuable habitat improvement work to pursue. While no single entity will restore a healthy Washougal River with thriving wild fish populations, it is possible for a collaborative watershed forum to provide multi-disciplinary review of this assessment and begin to take coordinated steps toward significantly restoring ecological health and fish habitat on the Washougal River.

The Washougal River has benefitted from past habitat projects and from current efforts by a number of conservation-oriented groups. What this assessment suggests is that there are many more possibilities for building on that work now and for years to come.

CITATIONS

Lower Columbia Fish Recovery Board, 2006. Salmon-Washougal & Lewis Watershed Management Plan. (Specifically pages 34-35, 73-74; remainder of report for additional context and discussion.) Available online:

https://www.lcfrb.gen.wa.us/files/ugd/810197_eb8b0a2912f945058e652cb28829d3eb.pdf

US Census:

<https://www.census.gov/quickfacts/fact/table/clarkcountywashington,washougalcitywashington/PST045221>

APPENDIX A: IDENTIFIED PROJECTS – CONCEPTS & DESCRIPTIONS

OUTREACH & REGULATORY PROJECTS

In-Town Fishing Improvements (~RM 0 – 3, mixed ownership) - By observation, there appears to be heavy fishing pressure that could be impacting salmon and steelhead populations. We recommend that appropriate state and local authorities research these impacts, with the hypothesis that the ready in-town access points present a cultural (rather than physical) fish passage barrier. It may be a chokepoint for fish migrating upstream to spawn. Recreational and sustenance fishing is legal at various times and already subject to regulation but the numerous fishermen and salmon carcasses observed suggest that this could be a fruitful area of inquiry, with potential outreach if not additional regulation, on behalf of struggling salmonid populations.



Salmon and other fish carcasses were observed several times along the lower Washougal River in early autumn 2021. Here is a large cluster of them at the Hathaway Park boat ramp – an area of easy public access and easy river walkability, creating a potential cultural fish passage barrier.

Hathaway Park Boat Ramp Outreach (RM 2.4, public) - Per the “In-Town Fishing” research and regulation suggestion above, a large number of fish (salmon and other) carcasses were observed in early autumn 2021. On 9-10-21, the boat ramp and adjacent stream had >10 carcasses, apparently filleted by fishermen. The easy access, popularity, and fishing impact here suggests a need for appropriate signage, and/or enforcement of existing fishing regulations with the presence of WDFW or other agency personnel.

Riparian Resident Mailer (~RM 0 – 3, private) - There is a wide variety of private properties and riparian vegetation conditions in the lower Washougal River, from completely forested to bare lawns down to the river’s edge. Public agencies (the city, county, conservation districts) could enhance instream shading and other aspects by encouraging riparian planting and sharing best-management tips with landowners, perhaps as simply as preparing an outreach mailer with periodic follow-up. (See also the knotweed project, below.)

RIPARIAN VEGETATION



Japanese knotweed, a notoriously invasive species along waterways, vies with Himalayan blackberry, another aggressive non-native species, along the lower Washougal River. Both appear in patches along the river. (Note, too, tree-of-heaven in the photo's lower right corner).

Washougal Japanese Knotweed Control (All RMs, mixed ownership) - There are several commonly observed invasive plants along the Washougal River's banks, including Himalayan blackberry (aka Armenian blackberry, *Rubus discolor*), reed canary grass (*Phalaris arundinacea*), tree-of-heaven (*Ailanthus altissima*) etc., and Japanese knotweed (*Fallopia japonica*, synonyms *Reynoutria japonica* and *Polygonum cuspidatum*). Knotweed is both aggressive, patchy and, by observation, not yet so widespread as to be uncontrollable. Skamania County Noxious Weed Control has already initiated control efforts among several landowners, but an even more comprehensive campaign of landowner outreach/education and assisted eradication, accompanied by replanting of appropriate native species, would improve the riparian health of the Washougal River. Knotweed is said to be a rapid-spreader, and allowing it to pervade will probably ensure that it becomes nearly impossible to control.



Planting and weeding riparian banks near River Bend Park.

(Left): A stream bank bare except for grass. Habitat could benefit from riparian trees, or even a simple shrub layer. (Above): View upstream, with healthier riparian area on the right, and River Bend Island thicket of blackberries and knotweed on the left.

River Bend Island Enhancement (RM 1.8, public) - In the river, an easy side channel wade from River Bend Park, and shortly downstream from the Sandy Swimming Hole Park, this island (approximately 700'x125') is half over-run by invasive blackberries and knotweed. Proposed: a multi-phase project to remove the dense patch of blackberry and knotweed (intermingled) on the banks of this island; replant densely with thicket-forming native riparian shrubs and trees.

3rd Avenue Bridge Bank Planting (RM 1.75, private/multiple) - Plant native trees and/or shrubs on a bare floodplain terrace approximately 250' long x 50' wide. Currently the streambank is just grass, with a wide bare-soil terrace behind it. This would require participation by several private homeowners.



River-Mile 2.85 Riparian Planting (RM 2.85, private/multiple) - The 900'-long lawn here, owned by a homeowners' association and several adjacent residents, includes a healthy streambank fringe of trees. Were homeowners interested, the riparian forest here could be replanted to widen it from one tree-width to two or three trees' wide, providing excellent long-term shading and other habitat benefits. A reforestation project, with a mix of native conifer and deciduous species, could also be carried out in conjunction with some landscaping elements such as a wide walking trail, picnic shelter, river-viewing platform, etc., to improve the residents' enjoyment. See also related River-Mile 2.85 Boulders and Side Channel projects, below.

INSTREAM HABITAT



Camas Greenway – Small Island (RM 1.0, public) - The long greenway is owned, on both banks, by the City of Camas. The river here has little instream complexity and much public access and fishing pressure. Large woody debris (LWD) was previously placed downstream of the pedestrian bridge. Upstream of the bridge about 230' is a small bar/island: LWD on river-right, and potentially boulders on river-left, opposite the large ponds, would increase habitat complexity and provide structure and cover for salmon, with little hazard to infrastructure, houses, or recreational access. Additional LWD could be placed along the stream margin below the bridge.

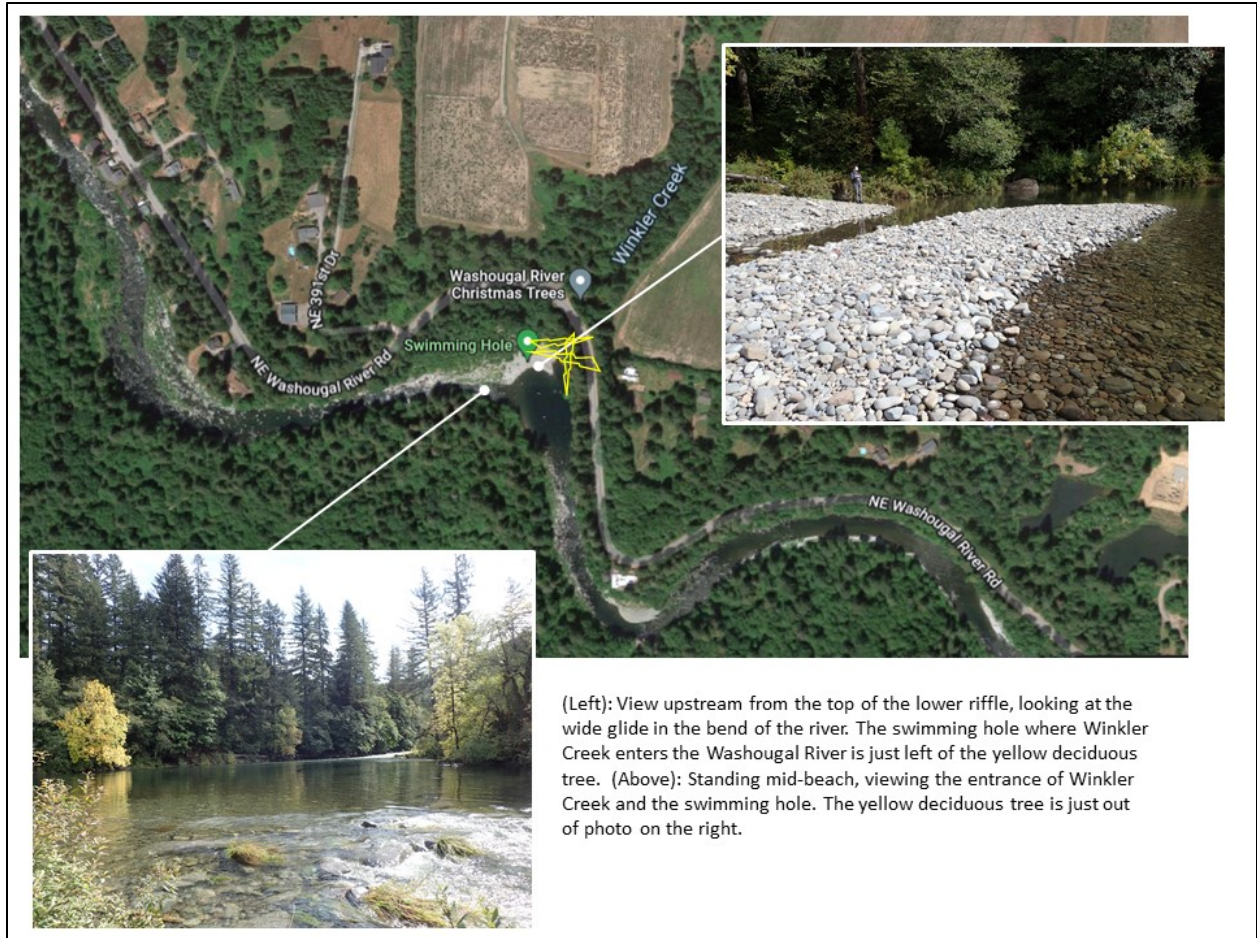
Camas Greenway – Large Island (RM 1.17, mixed ownership) - A short way upstream from the pedestrian bridge is a larger island/bar. Most of the ownership here is City of Camas, plus one private parcel. An engineered logjam here at the mouth of the island, defined by a high-flow side channel, could provide instream complexity and cover for fish, if it could be feasibly situated along the streambank to withstand flow pressure in the side channel.



Side-channel excavation and in-stream boulders

River-Mile 2.85 Boulders (2.85, private/multiple) - A wide, shallow glide with little complexity runs for at least several hundred feet. Habitat for fish could be enhanced through (highly engineered) log jams or large instream boulders or gabions. Boulders, logs, and/or gabions would produce local instream hydraulic complexity, potential small pools and gravel-capture, without necessarily altering primary flow characteristics or bank interactions. Access to the multiple private properties is probably very difficult, unless combined with the River-Mile 2.85 Side Channel project, below.

River-Mile 2.85 Side Channel (2.85, private/multiple) - This potential project could be implemented as a stand-alone or in conjunction with instream boulder placement. A wide long (~900' long) flat common area lawn could be repurposed to complex riverine habitat by excavating a side channel. Forested fringe could be left as island (with pedestrian bridge for homeowners' association?). The project would reduce lawn maintenance, and side channel habitat would benefit multiple fish species with little hazard to infrastructure. In fact, it may slightly ameliorate flooding hazards immediately downstream at high flow conditions. See also potential alternative or complementary project, "River-Mile 2.85 Riparian Planting," above.



Natural Area Swimming Hole Enhancement (RM 10.45, public) - A large glide between two riffles at a sharp bend in the Washougal River marks this site; tiny Winkler Creek enters the river here at the slackwater outside of the bend, where there is a deep backwater that serves as a swimming hole here, a publicly owned natural area. A large, engineered log jam could provide cover for resting salmon (which were observed swimming through the riffles). If well-placed, logs would not need to hinder wading or swimming. Machine access would be difficult, but public agencies owning the parcels involved might be willing to donate trees to be directionally felled and/or winched into place. This project needs to be vetted by fish biologists against the risk of providing an anglers' chokepoint for migrating salmon.



(Left): The WDFW weir off Public Fishing Road, and the view downstream.
(Right): View upstream from the weir.

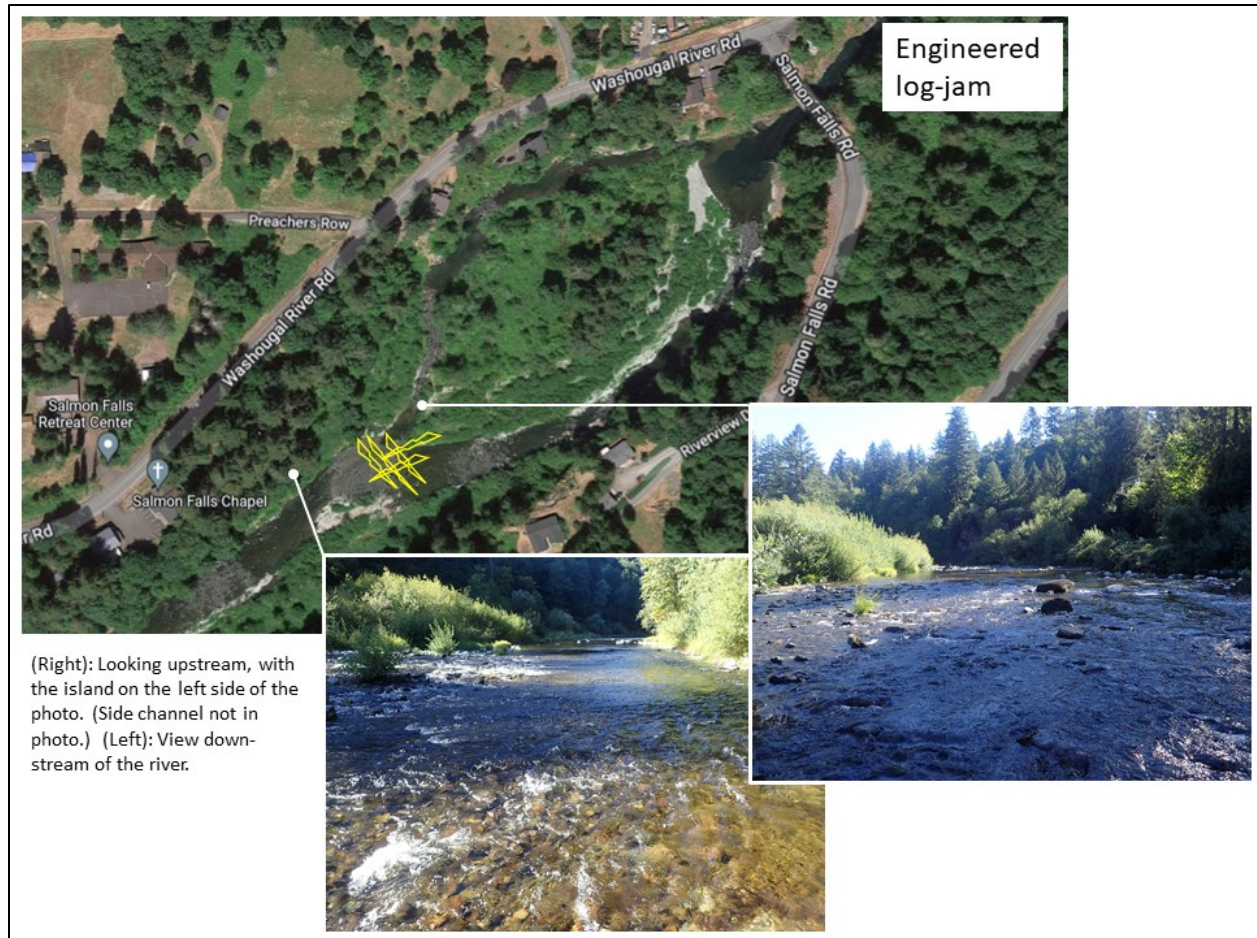
Weir Site LWD (RM 11.4, public) - There is public property on both banks, but for only a few dozen feet upstream of weir, then private, additional permissions are needed. The hydraulic complexity of two riffles and a glide, with ready access from a road down to the river, suggests this is a potentially beneficial site for engineered LWD, possibly threaded into/anchored in riparian conifers on river-left. While seemingly very feasible, this project would need to be coordinated with WDFW which operates a seasonal weir here.



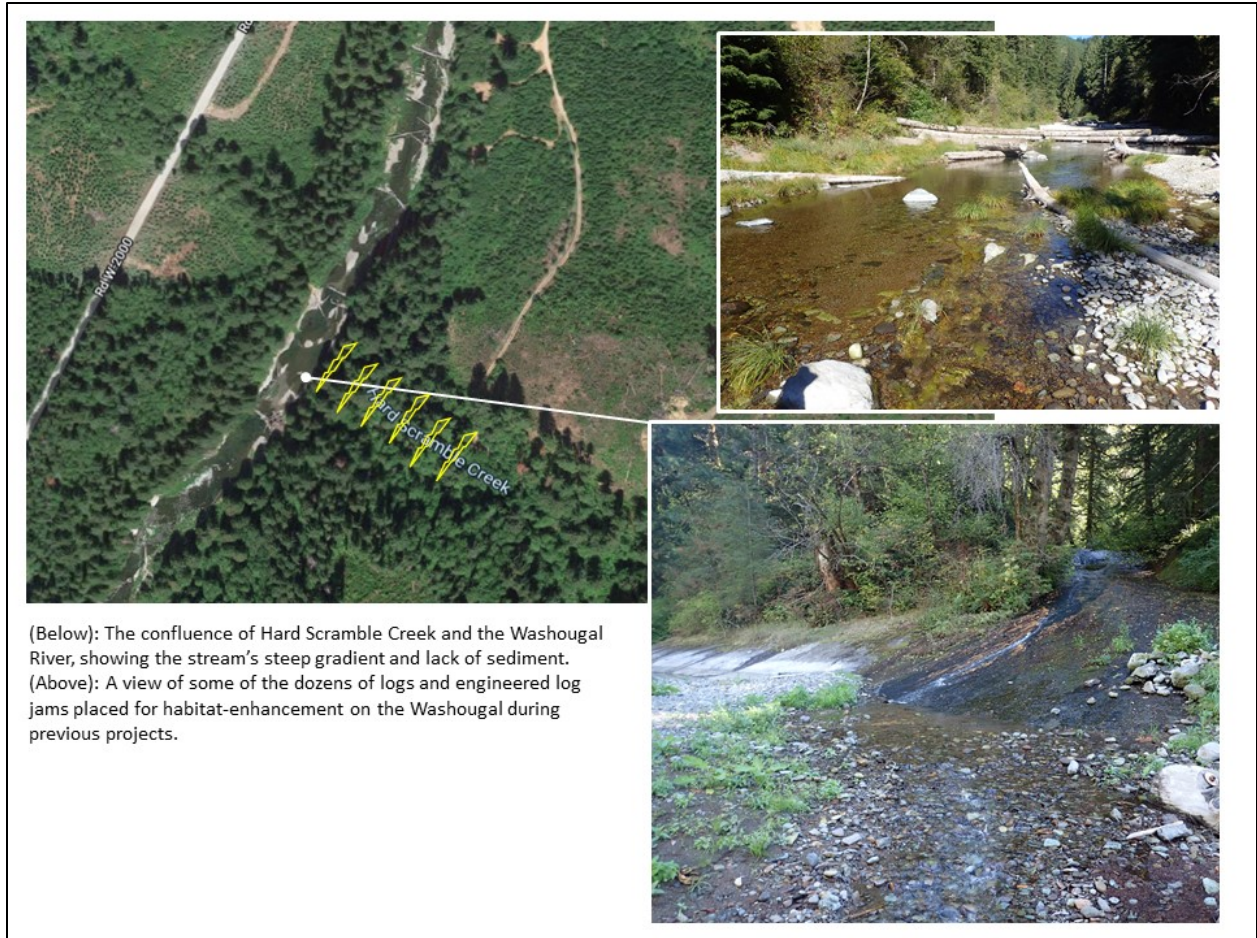
River-Mile 12 Bend Habitat Complexity (RM 12.2, private) - This site is a rare one in which the same owner has property on both sides of the river, and for several hundred feet both upstream and downstream. The river-left bank is heavily forested. The river-right is actively eroding into a large parcel with several acres of open space and a house. The project could entail enlarging a previous, non-functional bank-stability log and ecology-block feature with larger, additional logs in an engineered jam. Adding boulders to the bank and/or cobble bar upstream to slow current hitting the bank and build up the bar or side channel there is another consideration. A bar or a complex thread there could reduce bank erosion and potentially add habitat complexity.



West Fork Confluence Complexity (RM 14.0, private) - The perennial tributary, West Fork Washougal enters here at river-right. This is a hydraulically rich reach as the river narrows and bends, and there is a large cobble bar on river-left. There are potential sites for LWD at the confluence (the outside bend of river), or threaded into river-left conifers and laying across the cobble bar (the inside bend of the river), and/or other placements in proximity. Access could be difficult for machinery, but standing dead conifers and live trees on site could be donated or purchased to make directed felling by a ground crew a feasible possibility.



Salmon Falls Island Complexity (RM 14.75, private) - Just downstream of the Salmon Falls Road bridge, this island's small side channel, carrying approximately a quarter to a third of the river's flow, might be an appropriate place for an engineered log jam to create a scour pool and instream cover and complexity; and given cobble-bars and small gravel beds nearby, might persist for some time. Access could be challenging; logs may need to be maneuvered into place with grip-hoists and similar cable-directed methods. Nearby houses are located on tall terraces and would not be impacted by hydraulic changes (if any).



(Below): The confluence of Hard Scramble Creek and the Washougal River, showing the stream's steep gradient and lack of sediment.
 (Above): A view of some of the dozens of logs and engineered log jams placed for habitat-enhancement on the Washougal during previous projects.

Hard Scramble Creek Habitat Complexity and Passage (RM 22.95, private) - Hard Scramble Creek, a perennial tributary on river-left, has a steep gradient and is scoured to bedrock, forming a scoured water-slide-like effect. However, approximately 150' upstream of the confluence, a couple of fallen logs have captured and filled the streambed with mixed sediment upstream. Directional felling and/or placing several additional logs fully perpendicular to Hard Scramble Creek could recapture sediment at and upstream of its confluence, perhaps restoring the creek to a cascade of small plunges and steps, and a functional small tributary stream to the Washougal.

SCHMID PARK



Schmid Park Side Channel Habitat Enhancement (RM 3.45, public) - The City of Washougal's Schmid Park property is 15+ acres, with approximately 10 acres on a lower terrace, perched ~10' above the Washougal River on river-left, the outside of a bend. The river here braids between a couple of small islands mid-stream. The site suggests potential for a large fish habitat project: Grading the bank to create a sinuous side channel (the photo above shows a potential side channel of about 850'), with placed log jams. Such a side channel here could create a high quantity of valuable complex habitat, especially if kept off-limits to fishing on site. It would also relieve high water/flood pressure somewhat from houses on river-right. Proper design, potentially with a log structure at the upstream inlet, would help the side channel activate at high flow conditions without capturing the river's main channel.

The park is sizeable, and machinery would have ready access. A large-scale project here would not significantly reduce the value of lower terrace acreage as open space or dog park. There is enough room for both open space and stream habitat, with an opportunity for public outreach through interpretive signage. It is perhaps the most viable project site identified along the river.



Another aerial view, with the City of Washougal-owned Schmid Park parcel outlined in blue. Other, mostly private, parcels are in light gray. (Screen capture from Clark County online land records, 3-29-22.) Note the braided flow of the river here.