Public Works Department
City of Bellingham

2022 CITY OF BELLINGHAM FISH BARRIER PRIORITIZATION

December 2022

The City of Bellingham encompasses eight watershed and their associated streams (Figure 1). Most stream reaches are fish-bearing and support populations of both anadromous and resident salmon and trout. As documented in the City's Comprehensive Plan, the City is committed to stewarding fish and wildlife habitat, including fish-bearing streams. As part of this commitment, the City has a long history of improving fish passage throughout the City and Urban Growth Area both with independent restoration projects and in conjunction with other capital improvement projects. Since the early 2000s, the City has developed and used prioritization tools to plan for these fish passage improvement projects.

Purpose

The purpose of the City of Bellingham Fish Barrier Prioritization is to identify high priority barrier improvement projects for planning and implementation. The purpose of this 2022 update is to incorporate new information into the City's barrier prioritization since the last update in 2019. More specifically, the 2022 prioritization update incorporates:

- The most current Washington Department of Fish and Wildlife (WDFW) barrier assessments (August 2022);
- Barrier improvements and restoration completed since 2019;
- City of Bellingham Flood Control Dams Fish Passage Assessment, Alternatives Analysis, and Conceptual Design (ESA, 2019a);
- The most recent City of Bellingham 6-year Transportation Improvement Plan (2023-2028);
- Adjusted scoring for lineal gain as recommended by a third-party review of the 2019 Fish Barrier Prioritization (ESA, 2019b); and
- Adjusted scoring for anadromous juveniles present as recommended by a third-party review of the 2019 Fish Barrier Prioritization (ESA, 2019b).

This prioritization is intended to be updated in the future as conditions, opportunities, and standards change.

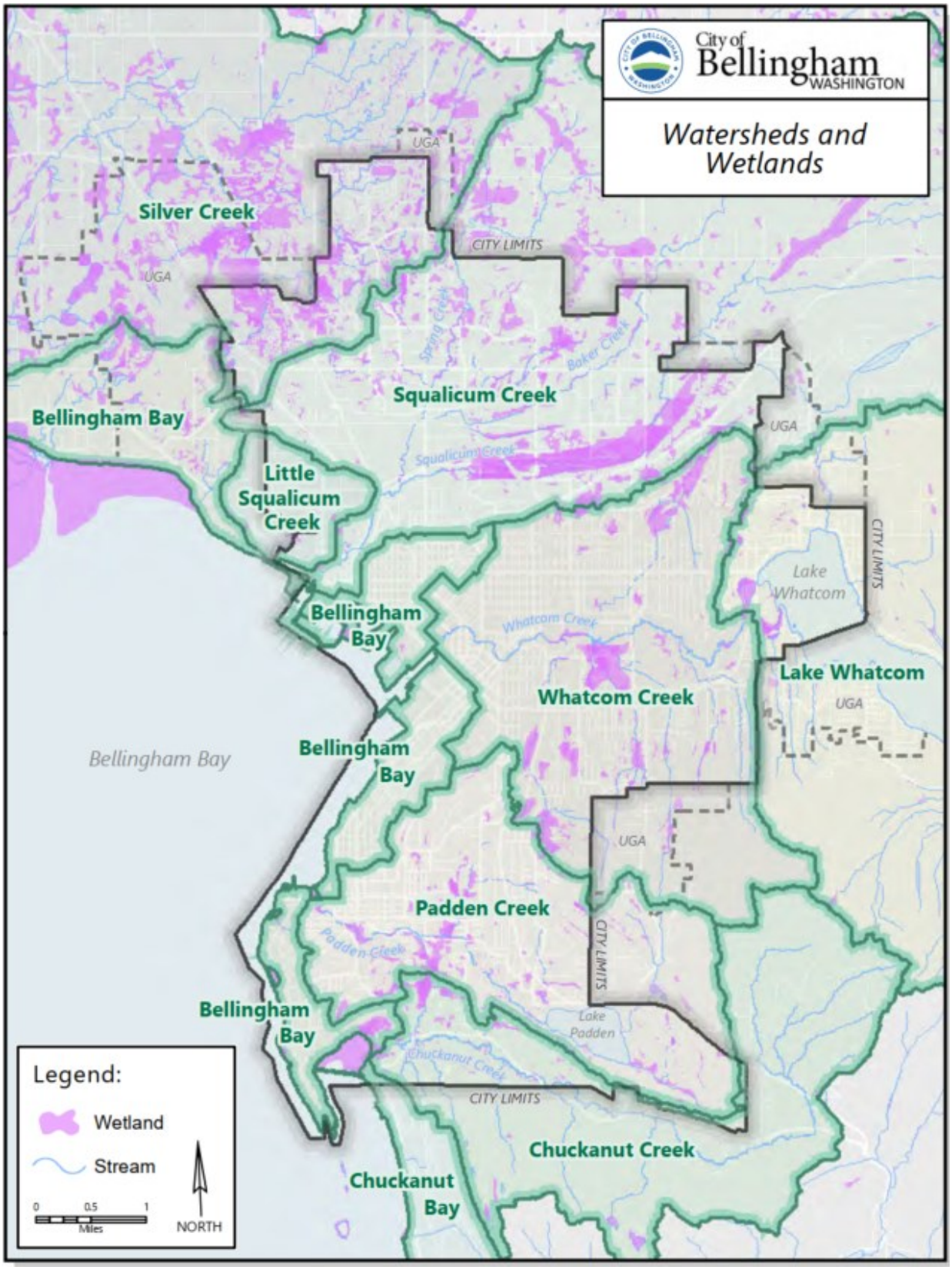

Figure 1. Bellingham Watersheds

Background

The City of Bellingham formally initiated a culvert improvement program in 2003 to address barriers to fish passage in the City limits, including culverts in Padden Creek, the Baker and Spring Creek sub-watersheds of Squalicum Creek; the Bear Creek sub-watershed of Silver Creek; the Lincoln, Cemetery, and Hannah sub-watersheds of Whatcom Creek; and a portion of Chuckanut Creek. This initial effort prioritized culvert improvements using a decision matrix that included replacement benefits, constraints and repairs.

In 2006, Whatcom County completed a county-wide fish passage barrier inventory (Whatcom County Public Works, 2006). The inventory scope was limited to non-state-owned barriers within the County accessible to anadromous fish. Their Chuckanut Foothills Sub-basin analysis included the following Bellingham streams: Squalicum Creek, Whatcom Creek, Padden Creek, and Chuckanut Creek. For these streams, Whatcom County and their partners conducted new field assessments for barriers outside the Bellingham city limits and utilized existing WDFW barrier information within the City limits. New field assessments were conducted in accordance with the *Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual* (WDFW, 2000).

In 2010, the City completed an updated prioritization (Anchor QEA, LLC, 2010). The goal of the 2010 effort was to describe the culvert improvement program to date, document projects completed since 2003, and update the prioritization. The update included analysis of 140 culverts in the City of Bellingham and used a Priority Index (PI) score calculated by the project team based on WDFW guidelines contained in the *Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual* (WDFW, 2009). In 2011, the City completed an addendum to the 2010 prioritization (Confluence Environmental Company, 2012). The addendum expanded the study area to include Lake Whatcom culverts within the City of Bellingham. The addendum also updated the prioritization by accounting for projects completed since 2006.

In 2014 the City of Bellingham was one of the select communities chosen for a full barrier inventory. The 2014 city-wide barrier inventory was part of WDFW's state-wide inventory of fish passage barriers. The purpose of this inventory was to fill data gaps in their state system, including updated PI scores for many barriers. The 2014 WDFW city-wide barrier inventory replaced the barrier assessment data used in the 2010 prioritization and 2012 addendum, outdating the prioritizations. This 2014 inventory, together with subsequent WDFW inventory updates, are available on WDFW's Fish Passage and Diversion Screening Inventory (FPDSI) database (WDFW, 2022a).

As described under Purpose, above, this 2022 update continues to incorporate new information, including the most recent barrier assessments documented on the FPDSI database. As of the date of this update, the FPDSI database (WDFW, 2022a) lists 165 city-owned structures, of which 88 (53%) are identified as barriers to fish passage (Table 1).

Table 1. Fish Passage Status for City-owned Stream Structures (WDFW, 2022)

Fish Passage Barrier Status		Percent of Total
Yes	88	53%
67% passable	*17*	
33% passable	*30*	
0% passable	*35*	
unknown	*6*	
Unknown	17	10%
No	49	30%
Not Applicable	11	7%
Other	2	1%
TOTAL	**165**	

Coordination

The City has a long history of coordinating barrier improvements with other entities to maximize habitat benefits and cost efficiencies. This coordination is on-going and increasingly important as the State implements barrier improvements to meet a 2013 federal injunction. The injunction requires the State to open 90 percent of the habitat blocked by State-owned fish passage barriers by 2030. Out of the 992 barriers under state highways, the Washington Department of Transportation (WSDOT) prioritized 415 barriers for removal by 2030. The City, WDFW and WSDOT gave a joint presentation and tour to the State's Joint Transportation Committee in October 2018 to highlight recent coordination between the City and State in barrier removal, including the 2015 Padden Creek Daylighting project and Squalicum Creek Re-route Phases 1 and 2 projects. This coordination continued through the fall of 2018 and spring of 2019 as the City and WSDOT discussed the State's plans to improve several fish passage barriers within the City by 2025. The City agreed to incorporate these planned projects into this updated local barrier prioritization to facilitate ongoing coordination between the City and State with the goal of maximizing the effectiveness of barrier improvement investments.

In addition to coordinating with State barrier improvements, the City also participates in the WRIA 1 culvert coordination effort facilitated by Whatcom County through the Salmon Recovery Funding Board Lead Entity. The County re-convened local stakeholders in early 2019 to coordinate and identify synergies between upcoming barrier improvement projects. The City continues to participate in these culvert coordination meetings. Participants include the City of Bellingham, Whatcom County, Nooksack Tribe, Lummi Nation, US Forest Service, Washington Department of Natural Resources (WDNR), WSDOT, WDFW, Whatcom Conservation District, Whatcom Land Trust, and the Nooksack Salmon Enhancement Association.

In 2022 the City, Nooksack Indian Tribe, Lummi Nation, and WDFW signed a Fish Barrier Culvert Remediation Project Memorandum of Agreement (Culvert MOA) to advanced City-owned fish barrier improvements through expanded coordination and a shared understanding. The purpose of the Culvert MOA is to coordinate to *prioritize and create a schedule for remediating culverts owned by the City of*

Bellingham that block or that partially block anadromous and resident fish passage. To our knowledge this is the first MOA of its kind between Washington State fisheries co-managers and a local jurisdiction to improve fish passage. Implementation of the Culvert MOA is anticipated to begin in early 2023.

Scope and Methodology

This 2022prioritization of fish barrier improvements encompasses all City-owned fish barriers within City limits including Silver Creek, Little Squalicum Creek, Squalicum Creek, Whatcom Creek, Padden Creek, and Chuckanut Creek watersheds. This prioritization was completed using existing information and did not include new fieldwork or barrier assessments.

The prioritization follows a seven step process as outlined below. Steps 1 through 5 focus on identifying the City's fish passage barrier sites, Step 6 refines and update barrier information, and Step 7 scores and ranks the sites. During each step, barriers were removed from the list and for subsequent steps if they were upstream of a total natural barrier, evaluated as having a PI=0 due to their location at the upstream extent of the anadromous zone, or were already corrected.

STEPS 1 -5: Identify Sites

1. Create a Draft Priority List consisting of the top 10 City-owned barriers within City limits identified in the Whatcom County Fish Passage Barrier Inventory (Whatcom County Public Works, 2006), ranked by 2006 PI score and listed by WDFW identifier number.
2. Update PI scores for the 10 barriers identified in 1, above, using the FPDSI database (WDFW, 2019a).
3. Review all City-owned barriers within City limits mapped on the FPDSI database (WDFW, 2019a) and add barriers with PI scores ≥ lowest score identified in 2, above (PI score ≥ 15.48).
4. Add barriers to the Draft Priority List if they:
    a. did not have a PI score but were lower in the system than barriers on the Draft Priority List from 3, above and/or
    b. are within 2 miles of a restoration site or barrier removal completed or planned to be complete by 2025. Planned projects are based on the City's adopted Six-Year (2020-2025) Transportation Improvement Program (City of Bellingham, 2019) and the WSDOT 2019 Project Delivery Plan (WSDOT, 2019).
5. Add any top 10 barriers from Anchor 2010 (from PI Ranks for All Barriers list), if not already on Draft Priority List from 4, above.

STEP 6: Refine Site Information

6. Update and add information:
    a. Calculate lineal gain if not provided on WDFW barrier forms by estimating distance in GIS using City of Bellingham stream layer.
    b. Update any data from qualified sources. In 2019, this consisted of updating fish Passability at the City's flood dams based on a habitat assessment conducted by Environmental Science Associates (ESA), Waterfall Engineering, Aspect Consulting,

and Wilson Engineering (2019). It also included updating the ESA species presence to include bull trout from WDFW (2019b).

STEP 7: Score and Rank Sites

7. Score and rank all culverts on the Draft Priority List from step 7 using the Prioritization Equation below. The equation uses 12 metrics. These metrics represent key information available for all barriers together with Additional Considerations (species listings, coordination, benefits, juveniles, community support, and funding opportunities) provided in the WDFW *Fish Passage Inventory, Assessment and Prioritization Manual* (WDFW, 2019c, p. 12-5). See the Prioritization Manual for methodologies and descriptions of each of the Additional Considerations.

Prioritization Equation:

SCORE =

Lineal Gain + Passability + ESA + Coord. Barriers + Coord. Other + (Benefits/3) + Juveniles + Comm. Support + Funding Opp. – Cost

The equation metrics represent three general categories:

- Fish Need/Benefit – lineal gain, passability, Endangered Species Act (ESA), juveniles, benefits habitat, benefits surface waters, and benefits restoration
- Coordination with Other Efforts – coordination barriers, coordination other
- Support and Cost Feasibility – Community support, funding opportunity, and cost

Table 2 shows the maximum possible scores in each category and the percent contribution to the maximum possible score.

Table 2. Prioritization Equation Metric Summary

Category	Maximum Possible Score	Percent of Total Possible Score
Fish Need/Benefit	19	61%
Coordination with Other Efforts	6	19%
Support and Cost Feasibility	6	19%
TOTAL SCORE	**31**	

Below is a description and score value for each metric in the Prioritization Equation.

Lineal Gain:

For barriers with lineal gain ≤15,000 linear feet:

SCORE = (3 * lineal gain) / 10,000

Barriers with > 15,000 lineal gain = 4

Barriers with >20,000 lineal gain = 5

Use lineal gain on existing WDFW barrier forms. If lineal gain not provided, use any existing lineal gain from downstream WDFW barrier form and add additional stream length to extent of anadromous habitat by measuring GIS distance. Measure GIS distance by viewing WDFW SalmonScape map (WDFW, 2019b) and Northwest Indian Fisheries Commission Statewide Integrated Fish Distribution (SWIFD) map (NWIFC, 2019) and determining furthest upstream extent of documented, presumed, or potential for anadromous species. Since all barriers in anadromous fish habitat, measure upstream to extent of anadromous habitat. Distance is calculated in meters for consistency with WDFW barrier forms.

Passability:

67% = 0.5
33% = 2
0% = 3
Unknown is given a default of 1

ESA:

Non-ESA listed salmonids present or potentially present = 1
1 ESA listed species present or potentially present = 2
≥2 ESA listed species present or potentially present = 3

As documented on WDFW fish barrier field form

Coordination - Barriers:

>5,280 feet upstream of a planned barrier improvement = 0.5
>5,280 feet upstream of a completed barrier improvement = 1
≤5,280 feet upstream of a planned barrier improvement = 1.5
≤5,280 feet upstream of a completed barrier improvement = 2
Downstream of a planned barrier improvement = 2
Downstream of a completed barrier improvement = 2.5
Downstream of >1 completed barrier improvement = 3

Coordination - Other:

At same location as a future transportation, utility, or similar project planned for construction by 2028

Surface only or no improvements = 0
Minor excavation required = 1
Major excavation required = 2
Full roadbed reconfiguration/construction = 3

Benefits - Restoration:

>5,280 feet upstream of a planned restoration project = 0.5
>5,280 feet upstream of a completed restoration project = 1
≤5,280 feet upstream of a planned restoration project = 1.5
≤5,280 feet upstream of a completed restoration project = 2

Downstream of a planned restoration project = 2
Downstream of a completed restoration project = 2.5
Downstream of >1 completed restoration project = 3

Restoration projects are stream, wetland, or riparian restoration projects that are named and inventoried as part of the City of Bellingham Restoration Program. Does not include fish passage barrier improvements since those projects are captured in Coordination – Barriers.

Benefits - Surface Waters:

1 point for each:

Increases storage capacity/reduce flood risk = 1
Expands floodplain = 1
Incorporates measures to address Category 5 303(d) listing(s) = 1

Benefits - Habitat:

Barrier in Tier 2 subwatershed = 1
Barrier in Tier 1 subwatershed = 2
Barrier prioritized or within prioritized restoration polygon = 3

Based on Habitat Restoration Technical Assessment, Nearshore and Estuarine Assessment and Restoration Prioritization (MacLennan et al., 2013), Bellingham Bay Action Team, or other similar effort.

Juveniles:

No anadromous juveniles present = 0
Anadromous juveniles present = 1

Juvenile presence based on work by Skagit River System Cooperative showing use by juvenile salmon in the lower reaches of non-natal streams. Assign 1 point if barrier is within 200 meters of the marine water.

Community Support:

1 point for each:

Educational opportunity associated with correction = 1
Willing non-City stakeholder(s) = 1

Funding Opportunities:

Potential funding source other than Fish Barrier Removal Board Funding = 1

Includes consideration of other project elements (e.g., habitat restoration, public access, parks) that may be good fits for other grant funding.

Cost:

Incremental funds needed <$1.5M = 0

Incremental funds needed ≥$1.5M to $3.5M = 1
Incremental funds needed >$3.5M to $5M =2
Incremental funds needed >$5M = 3

Rather than WDFW (2009), used cost breaks from WSDOT cost estimation based on width of proposed structure (0-16' = $1.5-$3.5M, 17-26' = $3.5-$5M, >26' = >$7M)

Results

The results of each step of the 2022 prioritization are included in Attachments 1 - 7. The final barriers prioritized for improvement in 2022 are shown in Table 2 and Figure 2.

A summary of the results of each step is as follows:

STEP 1. Create a Draft Priority List consisting of the top 10 City-owned barriers within City limits identified in the Whatcom County Fish Passage Barrier Inventory (Whatcom County Public Works, 2006), ranked by 2006 PI score and listed by WDFW identifier number.
Results: 10 barriers added to the list

STEP 2. Update PI scores for the 10 barriers identified in 1, above, using the FPDSI database (WDFW, 2019a).
Results: 3 barriers removed: None of the three barriers are documented by WDFW as fish passage barriers.
7 barriers remain

STEP 3. Review all City-owned barriers within City limits mapped on the FPDSI database (WDFW, 2019a) and add barriers with PI scores ≥ lowest score identified in 2 (PI score ≥ 15.48).
Results: 10 barriers added.
16 barriers

STEP 4. Add barriers to the Draft Priority List if they:

a. did not have a PI score but were lower in the system than barriers on the Draft Priority List from 3, above and/or
b. are within 2 miles of a restoration site or barrier removal completed or planned to be complete by 2028. Planned projects are based on the City's adopted Six-Year (2023-2028) Transportation Improvement Program (City of Bellingham, 2022) and the WSDOT 2019 Project Delivery Plan (WSDOT, 2019).

Results: 22 barriers added, then 4 of these 22 barriers removed. One (1) was removed because the barrier improvement was complete (1280168). In addition, 2 were removed because barrier improvements were completed, and although the culverts remain as partial barriers, WDFW determined barrier improvement was of reasonable function and further barrier improvement was low priority

(991105 and 920646). Finally, 1 was removed due to WDFW determination stream was not suitable fish habitat (01.0559 0.10).
34 barriers

STEP 5. Add any top 10 barriers from Anchor 2010 (from PI Ranks for All Barriers list), if not already on Draft Priority List from 4, above.
Results: 3 barriers added, then 2 of these 3 barriers removed. 1 was removed because it is no longer documented by WDFW as a fish passage barrier, and the other was removed because the barrier improvement was completed.
35 barriers

STEP 6. Update and add information:

a. Calculate lineal gain if not provided on WDFW barrier forms by estimating distance in GIS using City of Bellingham stream layer.
b. Update any data from qualified sources. In 2022, this consisted of updating fish passability, PI score, and barrier reason from recent WDFW fish passage assessments.
c. Add cost estimates.

Results: Updated information on 5 barriers. Four barriers removed: 1 due to barrier improvement completed and 3 due to WDFW guidance that fish passage improvement has been completed to the extent feasible.
35 barriers

STEP 7. Score and rank all culverts on the Draft Priority List from step 7 using the Prioritization Equation.
Results: 35 barriers, ranked. Scores range from 16 to 3.6. See summary in Table 2.

Update Schedule

The underlying information used to prioritize barriers change as projects are completed, planning efforts change, and new biological information becomes available. Therefore, the City of Bellingham intends to complete periodic updates to the prioritization data and ranked barrier list

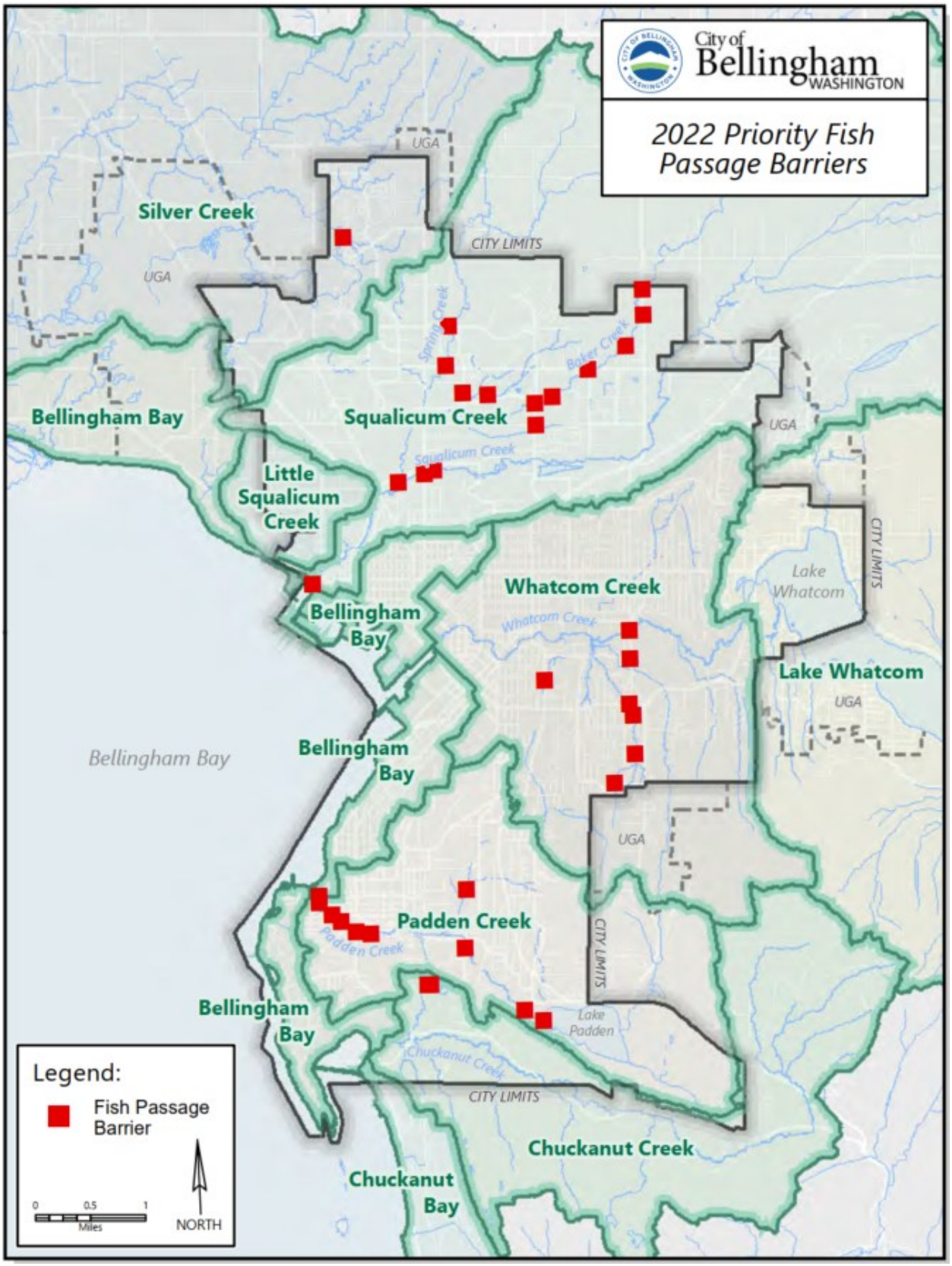

Figure 2. City-Owned 2022 Priority Fish Passage Barriers

Table 2. 2022 City of Bellingham Prioritized Fish Passage Barriers

RANK	Site ID	Stream	Road Crossing	Total PI 2022 (WDFW Form)	Lineal Gain (m)	Barrier Reason	Passability (%)	ESA	SCORE
1	991104	Squalicum Cr	Roeder Ave	-	38933	tidal influence	unknown	CH, ST, BT	**16.0**
2	994390	Padden Cr	footpath; 8th St		13177	insufficient data	unknown	CH, ST	**15.3**
3	01.0622 0.30	Padden Cr	10th St	**49.64**	12803	depth	33	CH, ST	**14.8**
4	01.0622 0.50	Padden Cr	12th St	**49.16**	12620	WS drop	33	CH, ST	**14.8**
5	01.0622 0.70	Padden Cr	14th St	**48.14**	12270	depth	33	CH, ST	**14.7**
6	994375	Padden Cr	Harris St		13257	insufficient data	unknown	CH, ST	**14.3**
7	01.0552 2.00	Squalicum Cr	Meridian St	-	17381	WS drop	67	CH, ST, BT	**14.2**
8	01.0622 0.80	Padden Cr	16th St	**53.96**	11942	WS drop	67	CH, ST	**14.1**
9	920649	Squalicum Cr	Cornwall Park ped bridge, old rock pathway	-	17541	WS drop	unknown	CH, ST, BT	**13.7**
10	993006	Baker Cr	James St	**15.61**	6064	other	67	ST	**13.3**
11	993881	SF Baker Cr	James St	**0.00**	2050	Slope	33	ST	**13.3**
12	602273	Squalicum Cr	Baker Cr confluence	-	36708	WS drop	33	CH, ST, BT	**12.7**
13	991600	Padden Cr	Lake Padden	**30.88**	3533	WS drop	0	ST	**11.1**
14	992981	Spring Cr	E Bakerview Rd	**25.43**	7318	velocity	67	ST	**10.7**
15	993038	Baker Cr	Telegraph Rd	-	5786	slope	0	ST	**10.2**
16	992656	Connelly Cr	Happy Valley Flood Dam, footpath; Mill Ave	**12.49**	1336	WS drop	0	ST	**10.1**

17	993884	NF Baker Cr	Telegraph Flood Dam, Telegraph Rd	-	1830	other	33	ST, BT	**9.9**
18	992984	Spring Cr	Kellogg Rd	**21.03**	6516	unknown	unknown	ST	**9.8**
19	991599	Padden Cr	39th St ROW	**27.65**	3917	slope	0	ST	**8.7**
20	993093	SF Baker Cr	Hannegan Flood Dam, Strider Lp	**24.77**	4043	other	67	ST, BT	**8.0**
21	993040	Baker Cr	E Bakerview Rd @ Irongate	**25.04**	5014	depth	33	ST	**8.0**
22	993883	Baker Cr	Deemer Rd	-	2260	slope	33	ST, BT	**7.7**
23	920634	Whatcom Cr	Woburn St	-	500	slope	0	CH, ST, BT	**7.3**
24	994370	Padden Cr	30th St	**18.01**	1103	slope	33	ST	**7.2**
25	993443	Baker Cr	Hannegan Rd	**18.26**	3457	velocity	67	ST	**6.5**
26	993821	Baker Cr	Hannegan Rd	**22.6**	2993	slope	33	ST	**6.2**
27	993483	Hoags Cr	Interurban Trail	**17.81**	283	slope	33		**6.1**
28	993482	Hoags Cr	25th St	**17.78**	263	slope	33	ST	**6.1**
29	370649	Cemetery Cr	San Juan Blvd	-	220	slope	0		**6.1**
30	370683	W Cemetery Cr	Old Lakeway Dr	-	1980	WS drop	0		**5.6**
31	370648	Cemetery Cr	Lopez St	-	1318	slope	0		**5.4**
32	1280163	E Bear Cr	Horton Flood Dam	-	2500	rack	unknown		**5.1**
33	370678	Lincoln Cr	Lincoln St	-	2590	slope	33		**4.8**
34	370679	E Cemetery Cr	Woburn St	-	120	WS drop	0		**4.0**
35	370658	W Cemetery Cr	Lakeway Dr	-	2141	slope	0		**3.6**

CH = Chinook, ST = steelhead, BT = bulltrout

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STEP 1: Create a Draft Priority List consisting of the top 10 culverts on City property or ROW identified in the Whatcom County Fish Passage Barrier Inventory (2006), ranked by 2006 PI score and listed by WDFW identifier number. Note Anchor 2010 PI and rank for comparison.

Site ID	Stream	Road Crossing	**Total PI 2006 (Form)**	Lineal Gain (m)	Barrier Reason	Passability (%)	ESA	Notes
992979	Baker Cr	unknown	**25.69**					
992981	Spring Cr	E Bakerview Rd	**25.43**	7318	velocity	67	ST	
993093	SF Baker Cr	Strider Lp	**24.77**	4043	other	0	ST, BT	Irongate flood dam
992984	Spring Cr	Kellogg Rd	**21.03**	6516	unknown	unknown	ST	upstream of Irongate flood dam
993443	Baker Cr	Hannegan Rd	**18.26**	3457	velocity	67	ST	upstream of Irongate flood dam
993110	Baker Cr	Hannegan Rd	**18.26**			67		
993821	Baker Cr	Hannegan Rd	**17.61**	2993	slope	33	ST	upstream of Irongate flood dam and other culverts
993880	SF Baker Cr	E McLeod Rd	**15.48**	1984			ST	
993006	Baker Cr	James St	**14.12**	6064	other	67	ST	
993487	Hoags Cr	Hoags Pond trail	**13.85**	100		0	ST	

CH = Chinook, ST = steelhead, BT = bull trout

STEP 2: Update PI scores, other stats using FPDSI database

Site ID	Stream	Road Crossing	**Total PI 2022 (Form)**	Lineal Gain (m)	Barrier Reason	Passability (%)	ESA	Notes
992978	Spring Creek	SR 539	**22.64**	**9015**	depth	67	ST	
992981	Spring Cr	E Bakerview Rd	**25.43**	7318	velocity	67	ST	
993093	SF Baker Cr	Strider Lp	**24.77**	4043	other	0	ST, BT	Irongate flood dam
993821	Baker Cr	Hannegan Rd	**22.6**	2993.00	slope	33.00	ST	upstream of Irongate flood dam and other culverts
992984	Spring Cr	Kellogg Rd	**21.03**	6516	unknown	unknown	ST	upstream of Irongate flood dam
993443	Baker Cr	Hannegan Rd	**18.26**	3457	velocity	67	ST	upstream of Irongate flood dam
993006	Baker Cr	James St	**15.61**	6064	other	67	ST	
CH = Chinook, ST = steelhead, BT = bull trout								
REMOVED IN THIS STEP								
993487	Hoags Cr	Hoags Pond trail	**0**	100	N/A	100	ST	no longer listed as a barrier, remove from list
993110	Baker Cr		**0**		N/A	100		no longer listed as a barrier, remove from list
993880	SF Baker Cr	E McLeod Rd	**0.00**	1984		100	ST	WDFW 5/26/22 survey determined 100% fish passable

STEP 3: Add barriers on City property or ROW from FPDSI database with PI score **≥ lowest PI score from Step 2**

Site ID	Stream	Road Crossing	**Total PI 2022 (Form)**	Lineal Gain (m)	Barrier Reason	Passability (%)	ESA	Notes
01.0622 0.80	Padden Cr	16th St	**53.96**	11942	WS drop	67	CH, ST	
01.0622 0.30	Padden Cr	10th St	**49.64**	3445	depth	33	CH, ST	
01.0622 0.50	Padden Cr	12th St	**49.16**	4023	WS drop	33	CH, ST	WDFW re-assessed and changed from 67% to 33% passable
01.0622 0.70	Padden Cr	14th St	**48.14**	3701	depth	33	CH, ST	WDFW downloaded list had 67 but barrier report says 33, changed.
991600	Padden Cr	Lake Padden	**30.88**	3533	WS drop	0.00	ST	
991599	Padden Cr	39th St ROW	**27.65**	3917	slope	0.00	ST	
992981	Spring Cr	E Bakerview Rd	**25.43**	7318	velocity	67	ST	
993040	Baker Cr	E Bakerview Rd	**25.04**	5014	depth	33	ST	
993093	SF Baker Cr	Strider Lp	**24.77**	4043	other	0	ST, BT	Irongate flood dam
993821	Baker Cr	Hannegan Rd	**22.6**	2993	slope	33.00	ST	upstream of Irongate flood dam and other culverts
992984	Spring Cr	Kellogg Rd	**21.03**	6516	unknown	unknown	ST	upstream of Irongate flood dam
993443	Baker Cr	Hannegan Rd	**18.26**	3457	velocity	67	ST	upstream of Irongate flood dam
994370	Padden Cr	30th St	**18.01**	1103	slope	33	ST	
993483	Hoags Cr	Interurban Trail	**17.81**	283	slope	33		
993482	Hoags Cr	25th St	**17.78**	263	slope	33	ST	
993006	Baker Cr	James St	**15.61**	6064	other	67	ST	

CH = Chinook, ST = steelhead, BT = bull trout

REMOVED IN THIS STEP

None

Attachment 4: Step 4

STEP 4: Add barriers if did not have a PI score but were: a. lower in the system than barriers on the Draft Priority List from 3, above and/or
b. are within 2 miles of a restoration site or barrier removal completed or planned to be complete by 2028 (and not above a natural barrier). (red = estimated from City iQ)

Site ID	Stream	Road Crossing	**Total PI 2022 (Form)**	Lineal Gain (m)	Barrier Reason	Passability (%)	ESA	Notes
01.0622 0.80	Padden Cr	16th St	**53.96**	11942	WS drop	67	CH, ST	
01.0622 0.30	Padden Cr	10th St	**49.64**	3445	depth	33	CH, ST	
01.0622 0.50	Padden Cr	12th St	**49.16**	4023	WS drop	33	CH, ST	
01.0622 0.70	Padden Cr	14th St	**48.14**	3701	depth	33	CH, ST	WDFW downloaded list had 67 but barrier report says 33, changed.
991600	Padden Cr	Lake Padden	**30.88**	3533	WS drop	0.00	ST	
991599	Padden Cr	39th St ROW	**27.65**	3917	slope	0.00	ST	
992981	Spring Cr	E Bakerview Rd	**25.43**	7318	velocity	67	ST	
993040	Baker Cr	E Bakerview Rd	**25.04**	5014	depth	33	ST	
993093	SF Baker Cr	Strider Lp	**24.77**	4043	other	0	ST, BT	Irongate flood dam
993821	Baker Cr	Hannegan Rd	**22.6**	2993	slope	33.00	ST	upstream of Irongate flood dam and other culverts
992984	Spring Cr	Kellogg Rd	**21.03**	6516	unknown	unknown	ST	upstream of Irongate flood dam
993443	Baker Cr	Hannegan Rd	**18.26**	3457	velocity	67	ST	upstream of Irongate flood dam
994370	Padden Cr	30th St	**18.01**	1103	slope	33	ST	
993483	Hoags Cr	Interurban Trail	**17.81**	283	slope	33		
993482	Hoags Cr	25th St	**17.78**	263	slope	33	ST	
993006	Baker Cr	James St	**15.61**	6064	other	67	ST	
994375	Padden Cr	Harris St			insufficient data	unknown	CH, ST	
992656	Connelly Cr	footpath; Mill Ave	**12.49**	1336	WS drop	0	ST	
994390	Padden Cr	footpath; 8th St			insufficient data	unknown	CH, ST	
993881	SF Baker Cr	James St	**0.00**		Slope	33	ST	Transpo Group estimated $1 million for full width bridge (2019 James St Mulitmodal Study)
1280163	E Bear Cr	N/A			rack	unknown		Horton flood dam
370683	W Cemetery Cr	Old Lakeway Dr			WS drop	0		
370648	Cemetery Cr	Lopez St			slope	0		
370658	W Cemetery Cr	Lakeway Dr			slope	0		
370679	E Cemetery Cr	Woburn St			WS drop	0		
370649	Cemetery Cr	San Juan Blvd			slope	0		
991104	Squalicum Cr	Roeder Ave			tidal influence	unknown	CH, ST, BT	10% design COB/Port/BNSF, 3 barrier bundle
602273	Squalicum Cr	Baker Cr confluence			WS drop	33	CH, ST, BT	flood "dam" (weir)
920634	Whatcom Cr	Woburn St			slope	0	CH, ST, BT	need to confirm 0% passability
993038	SF Baker Cr	Telegraph Rd		5786	slope	0	ST	adjacent to Filippini donation
993883	Baker Cr	Deemer Rd			slope	33	ST, BT	downstream of Telegraph flood dam
993884	Baker Cr	Telegraph Rd			other	67	ST, BT	Telegraph flood dam
920649	Squalicum Cr	Cornwall Park ped bridge			WS drop	unknown	CH, ST, BT	
01.0552 2.00	Squalicum Cr	Meridian St		17381	WS drop	67	CH, ST, BT	
CH = Chinook, ST = steelhead, BT = bull trout								
REMOVED IN THIS STEP								
991105	Squalicum Cr	West St			other	33	CH, ST, BT	Retrofit completed in 2005 EV-18. WDFW AHB confirmed low priority, retrofit addressed primary species/timing. Remove from list due to WDFW low priority for additional retrofit.
920646	Squalicum Cr	Northwest Ave			depth	unknown	CH, ST, BT	Retrofit completed in 2005 EV-18. WDFW AHB confirmed low priority, retrofit addressed primary species/timing. Remove from list due to WDFW low priority for additional retrofit.
1280168	Bear Creek	Mahogany Ave			slope	67	ST	City installed box culvert 2018 (ES-489), last WDFW survey was 2016. No longer a barrier, WDFW survey outdated.
01.0559 0.10	Trib W, Squalicum Cr	Meridian St			WS drop	67	CH, ST, BT	WDFW decision that Trib W not suitable fish habitat as part of Squal Re-route Ph 1-2 restoration design.

Attachment 5: Step 5

STEP 5: Add any top 10 barriers from Anchor 2010 (from PI Ranks for All Barriers list), if not already on spreadsheet

Site ID	Anchor, 2010 ID	Stream	Road Crossing	**Total PI 2022 (Form)**	Lineal Gain (m)	Barrier Reason	Passability (%)	ESA	Notes
01.0622 0.80	Padden 7	Padden Cr	16th St	**53.96**	11942	WS drop	67	CH, ST	
01.0622 0.30	Padden 3	Padden Cr	10th St	**49.64**	3445	depth	33	CH, ST	
01.0622 0.50	Padden 4	Padden Cr	12th St	**49.16**	4023	WS drop	33	CH, ST	
01.0622 0.70	Padden 6	Padden Cr	14th St	**48.14**	3701	depth	33	CH, ST	WDFW downloaded list had 67 but barrier report says 33, changed.
991600	N/A	Padden Cr	Lake Padden	**30.88**	3533	WS drop	0.00	ST	
991599	Padden 13	Padden Cr	39th St ROW	**27.65**	3917	slope	0.00	ST	
992981	Spring 2	Spring Cr	E Bakerview Rd	**25.43**	7318	velocity	67	ST	
993040	Baker 9	Baker Cr	E Bakerview Rd	**25.04**	5014	depth	33	ST	
993093	Detention	SF Baker Cr	Strider Lp	**24.77**	4043	other	0	ST, BT	Irongate flood dam
993821	Baker 13	Baker Cr	Hannegan Rd	**22.6**	2993	slope	33.00	ST	upstream of Irongate flood dam and other culverts
992984	Spring 4	Spring Cr	Kellogg Rd	**21.03**	6516	unknown	unknown	ST	upstream of Irongate flood dam
993443	Baker 12	Baker Cr	Hannegan Rd	**18.26**	3457	velocity	67	ST	upstream of Irongate flood dam
994370	Padden 11	Padden Cr	30th St	**18.01**	1103	slope	33	ST	
993483	Hoags 3	Hoags Cr	Interurban Trail	**17.81**	283	slope	33		
993482	Hoags 4	Hoags Cr	25th St	**17.78**	263	slope	33	ST	
993006	Baker 7	Baker Cr	James St	**15.61**	6064	other	67	ST	
370678	Lincoln 5	Lincoln Cr	Lincoln St			slope	33		
994375		Padden Cr	Harris St			insufficient data	unknown	CH, ST	
992656		Connelly Cr	footpath; Mill Ave	**12.49**	1336	WS drop	0	ST	
994390		Padden Cr	footpath; 8th St			insufficient data	unknown	CH, ST	
993881	SF Baker 2	SF Baker Cr	James St	**0.00**		Slope	33	ST	Transpo Group estimated $1 million for full width bridge (2019 James St Mulitmodal Study)
1280163		E Bear Cr	N/A			rack	unknown		Horton flood dam
370683	W Cemetery 3	W Cemetery Cr	Old Lakeway Dr			WS drop	0		
370648	W Cemetery 4	Cemetery Cr	Lopez St			slope	0		
370658	W Cemetery 2	W Cemetery Cr	Lakeway Dr			slope	0		
370679	Magnolia 1	E Cemetery Cr	Woburn St			WS drop	0		
370649	W Cemetery 5	Cemetery Cr	San Juan Blvd			slope	0		
991104	Squalicum 2	Squalicum Cr	Roeder Ave			tidal influence	unknown	CH, ST, BT	10% design COB/Port/BNSF, 3 barrier bundle
602273	Baker 1	Squalicum Cr	Baker Cr confluence			WS drop	33	CH, ST, BT	flood "dam" (weir)
920634	N/A	Whatcom Cr	Woburn St			slope	0	CH, ST, BT	need to confirm 0% passability
993038	N/A	SF Baker Cr	Telegraph Rd		5786	slope	0	ST	adjacent to Filippini donation
993883	NF Baker 2	Baker Cr	Deemer Rd			slope	33	ST, BT	downstream of Telegraph flood dam
993884	Detention	Baker Cr	Telegraph Rd			other	67	ST, BT	Telegraph flood dam
920649	N/A	Squalicum Cr	Cornwall Park ped bridge			WS drop	unknown	CH, ST, BT	
01.0552 2.00	N/A	Squalicum Cr	Meridian St		17381	WS drop	67	CH, ST, BT	
CH = Chinook, ST = steelhead, BT = bull trout									
REMOVED IN THIS STEP									
unknown	Spring 3	Spring Cr	Prince St	**0**	7032	N/A	100	ST	100% passable, not a barrier, remove from list
370673	Lincoln 1	Lincoln Cr	Frasier St			insufficient data	unknown	CH, ST, BT	mis-labeled as COB, should be private. City submitted correction to WDFW 3/18/19. Remove from list

Attachment 6: Step 6

STEP 6: Update any data from qualified sources (in 2019 = ESA fish passability at City's flood dams); calculate lineal gain if not provided by WDFW barrier forms. Estimate cost.

Site ID	Lat	Long	Anchor, 2010 ID	Stream	Road Crossing	Total PI 2019 (Form)	Lineal Gain (m)	Lineal Gain Calc	Barrier Reason	Passability (%)	ESA	Coordination- Barriers	Coordination- Transportation	Benefits	Cost Estimate	Notes
01.0622 0.80	48.72	-122.5	Padden 7	Padden Cr	16th St	**53.96**	11942		WS drop	67	CH, ST	downstream of WSDOT 2014 bridge, WSDOT prioritized project 2025	None	downstream of COB 2015 Padden Daylighting and Padden 24th to 30th Ph 1, COB 16th St repair 2016, WSDOT 2014 SR 11 Tier 1 subwatershed, in priority	$ 1,000,000	Completed repair of pool in 2016. Full fish passage requires replacing fish ladder and culvert.
01.0622 0.30	48.72	-122.5	Padden 3	Padden Cr	10th St	**49.64**	12803	WDFW 01.0622 0.70 + 533	depth	33	CH, ST	None		downstream of COB 2015 Padden Daylighting, COB 16th St repair 2016, WSDOT 2014 SR 11, Tier 1 subwatershed, in priority restoration polygon	$ 1,900,000	COB retrofit EV-23. Submit repair to WDFW so shows on database. WDFW re-assessed and still a barrier. Keep on list. Lineal gain on WDFW site report appears incorrect, much smaller than 14th St barrier report. Instead used 14th st lineal gain +350+183
01.0622 0.50	48.72	-122.5	Padden 4	Padden Cr	12th St	**49.16**	12620	WDFW 01.0622 0.70 + 350	WS drop	33	CH, ST	None		downstream of COB 2015 Padden Daylighting and Padden 24th to 30th Ph 1, COB 16th St repair 2016, WSDOT 2014 SR 11, Tier 1 subwatershed, in priority restoration polygon	$ 1,900,000	replace existing fish ladder and culvert. Submit repair to WDFW so shows on database. Retrofit completed EV-23. WDFW re-assessed and still a barrier. Keep on list. 2022 ESA cost estimate. Lineal gain on WDFW site report appears incorrect, much smaller than 14th St barrier report. Instead used 14th st lineal gain
01.0622 0.70	48.72	-122.5	Padden 6	Padden Cr	14th St	**48.14**	12270		depth	33	CH, ST	downstream of COB 16thSt repair 2016, WSDOT 2014 bridge, WSDOT prioritized project 2025	None	downstream of COB 2015 Padden Daylighting and Padden 24th to 30th	$ 1,570,000	
991600	48.7	-122.46	N/A	Padden Cr	Lake Padden	**30.88**	3533		WS drop	0	ST	upstream of COB 16thSt repair 2016, WSDOT 2014 bridge (9,500'), 2 WSDOT prioritized projects 2025 (4,250')	none		$ 500,000	at outlet of Lake Padden- dam
991599	48.71	-122.47	Padden 13	Padden Cr	39th St ROW	**27.65**	3917		slope	0	ST	upstream of WSDOT prioritized 2025, WSDOT Padden Daylighting	none	upstream of COB 2015 Padden Daylighting 2015, COB 16th St repair	$ 1,500,000	in Padden Gorge
992981	48.79	-122.48	Spring 2	Spring Cr	E Bakerview Rd	**25.43**	7318		velocity	67	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites; downstream of 2001 culvert repair at Van Wyck Rd	None	upstream of Spring Creek restoration site 2004, lower Squal restoration sites, COB Willow Spring	$ 1,000,000	
993040	48.79	-122.45	Baker 9	Baker Cr	E Bakerview Rd @ Irongate	**25.04**	5014		depth	33	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, lower Squal restoration sites, COB Willow Spring 2010/2018, upstream of Filippini donation to COB 2018 for	None	downstream of COB Spring Cr restoration site 2004; upstream of lower Squal restoration sites, COB	$ 1,000,000	
993093	48.79	-122.45	Hannegan Detention	SF Baker Cr	Strider Lp	**24.77**	4043		other	67	ST, BT	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Willow Spring 2010/2018, COB lower Squal restoration	None	CB Baker Cr restoration site, lower Squal restoration sites,	$ 1,000,000	Irongate flood dam, fish passability from ESA 2019, cost
993821	48.8	-122.44	Baker 13	Baker Cr	Hannegan Rd	**22.6**	2993		slope	33	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration site, lower Squal restoration sites	none	upstream of COB Willow Spring 2010/2018, COB lower Squal restoration sites, COB planned	$ 1,000,000	upstream of Irongate flood dam and other culverts
992984	48.8	-122.48	Spring 4	Spring Cr	Kellogg Rd	**21.03**	6516		unknown	unknown	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites	None	upstream of COB Spring Cr restoration site, lower Squal	$ 1,000,000	upstream of Irongate flood dam
993443	48.8	-122.44	Baker 12	Baker Cr	Hannegan Rd	**18.26**	3457		velocity	67	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration site, lower Squal restoration sites	proposed secondary arterial	upstream of COB Willow Spring 2010/2018, COB lower Squal restoration sites, COB planned	$ 1,000,000	upstream of Irongate flood dam
994370	48.71	-122.48	Padden 11	Padden Cr	30th St	**18.01**	1103		slope	33	ST	upstream and downstream of WSDOT prioritized 2025, upstream of WSDOT 2014 Padden Daylighting	none	upstream of COB 2015 Padden Daylighting 2015, COB 16th St repair 2016, WSDOT 2014 SR 11; in Tier 1	$ 4,830,000	2022 ESA cost estimate
993483	48.71	-122.49	Hoags 3	Hoags Cr	Interurban Trail	**17.81**	283		slope	33			None	in Tier 1 subwatershed, in priority restoration polygon	$ 250,000	assume WSDOT prioritized list for Chuckanut Cr barrier impr. Is mainstem, not Hoags Creek)
993482	48.71	-122.48	Hoags 4	Hoags Cr	25th St	**17.78**	263		slope	33	ST		None	in Tier 1 subwatershed, in priority restoration polygon	$ 500,000	
993006	48.78	-122.46	Baker 7	Baker Cr	James St	**15.61**	6064		other	67	ST	upstream of private McLeod 2007, COB McLeod2015, WSDOT prioritized 2025, COB Willow Spring 2010/2018,	James St Multimodal project,	upstream of COB Baker Cr, COB Willow Spring 2010/2018, COB lower	$ 1,000,000	
370678	48.75	-122.46	Lincoln 5	Lincoln Cr	Lincoln St		2590	GIS measurement	slope	33			none	upstream of COB 2006 Red Tail Reach, COB Whatcom Creek Estuary	$ 1,000,000	downstream of fred meyer tunnel.
994375	48.72024	-122.50715		Padden Cr	Harris St		13257	WDFW 01.0622 0.30 + 500	insufficient data	unknown	CH, ST			downstream of COB 2015 Padden Daylighting and Padden 24th to 30th Ph 1, COB 16th St repair 2016, WSDOT 2014 SR 11, Tier 1 subwatershed, in priority restoration polygon	$ 4,000,000	Lineal gain on WDFW site report appears incorrect, much smaller than 14th St barrier report. Instead used 14th st lineal gain +350+183+374+80
992656	48.72112	-122.47797		Connelly Cr	footpath; Mill Ave	**12.49**	1336		WS drop	0	ST				$ 1,000,000	
994390	48.71932	-122.50717		Padden Cr	footpath; 8th St		13177	WDFW 01.0622 0.30 + 435	insufficient data	unknown	CH, ST				$ 2,000,000	Lineal gain on WDFW site report appears incorrect, much smaller than 14th St barrier report. Instead used 14th st lineal gain +350+183+374
993881	48.78	-122.46	SF Baker 2	SF Baker Cr	James St	**0.00**	2050	GIS measure	Slope	33	ST	1 mi upstream of COB barrier improvement on Baker Cr at N	Orchard to Kellogg t	wider floodplain	$ 1,000,000	Transpo Group estimated $1 million for full width bridge (2019 James St Mulitmodal Study)
1280163	48.81	-122.5	N/A	E Bear Cr	Horton Flood Dam		2500	GIS measurement	rack	unknown		1.5 mi upstream of City Mitigation Bank site (Bear Cr), 1.5 mi upstream of Whatcom County planned improvement for barrier 1280204	None	1.5 mi upstream of City Mitigation Bank site (Bear Cr), 1.5 mi upstream of Whatcom County planned improvement for barrier 1280204	$ 1,000,000	Horton flood dam, cost estimated by COB
370683	48.74	-122.44	W Cemetery 3	W Cemetery Cr	Old Lakeway Dr		1980	GIS measure	WS drop	0			ES-0547 2019 TBD project, creating a 10-foot wide two-way bicycle	upstream of COB 2006 Red Tail Reach, COB Whatcom Creek Estuary, planned W Cemetery Cr WQ improvements	$ 500,000	
370648	48.74	-122.44	W Cemetery 4	Cemetery Cr	Lopez St		1318	GIS measure from Old Lakeway	slope	0			none	upstream of COB 2006 Red Tail Reach, COB Whatcom Creek Estuary	$ 500,000	
370658	48.75	-122.45	W Cemetery 2	W Cemetery Cr	Lakeway Dr		2141	GIS measure from Old Lakeway	slope	0			none	upstream of COB 2006 Red Tail Reach, COB Whatcom Creek Estuary	$ 5,000,000	
370679	48.75	-122.45	Magnolia 1	E Cemetery Cr	Woburn St		120	GIS measurement	WS drop	0			none	upstream of COB 2006 Red Tail Reach, COB Whatcom Creek Estuary	$ 5,000,000	upstream of natural barrier 920643
370649	48.73	-122.45	W Cemetery 5	Cemetery Cr	San Juan Blvd		220	GIS measure	slope	0			none	upstream of COB 2006 Red Tail Reach, COB Whatcom Creek Estuary,	$ 500,000	
991104	48.76	-122.51	Squalicum 2	Squalicum Cr	Roeder Ave		38933	WDFW 01.0552	tidal influence	unknown	CH, ST, BT	downstream of private McLeod 2007, COB Willow Spring 2010/2018, COB Squal Ph 1/2 2015, COB McLeod2015,	None	downstream of COB Willow Spring 2010/2018, COB Squal Ph 1/2 2015,	$ 4,000,000	10% design COB/Port/BNSF, 3 barrier bundle
602273	48.77	-122.49	Baker 1	Squalicum Cr	Baker Cr confluence		36708	WDFW 01.0552 1.80 plus 15 m	WS drop	33	CH, ST, BT	downstream of private McLeod 2007, COB Squal Ph 1/2 2015, COB McLeod2015, WSDOT prioritized 2025, COB Squal Ph 3/4 2020; upstream of COB Willow Spring 2010/2018, COB lower Squal restoration sites,	None		$ 4,860,000	flood "dam" (riser). Retrofit completed in 2005 EV-18?? Riser may not have been included in retrofit. 2022 ESA cost estimate
920634	48.76	-122.45	N/A	Whatcom Cr	Woburn St		500	GIS measurement to natural barrier	slope	0	CH, ST, BT		None	downstream of Boulder Bend and Whatcom Falls Park 1999 restoration; upstream of COB Red Tail Reach, COB Salmon Park, COB Cemetery Cr, COB Whatcom Cr	$ 7,000,000	
993038	48.79	-122.46	N/A	SF Baker Cr	Telegraph Rd		5786		slope	0	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration site, lower Squal restoration sites	None	upstream of lower Squal restoration sites, COB Willow Spring 2010/2018	$ 500,000	immediately upstream to Filippini donation
993883	48.79	-122.48	NF Baker 2	Baker Cr	Deemer Rd		2260	GIS measure	slope	33	ST, BT	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites	None	upstream of lower Squal restoration sites, COB Willow Spring 2010/2018	$ 3,000,000	Upstream of long private culvert under Home Depot
993884	48.79	-122.47	Telegraph Detention	NF Baker Cr	Telegraph Rd		1830	GIS measure	other	33	ST, BT	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites	ES-0537 Telegraph Rd project, 2021,	upstream of lower Squal restoration sites, COB Willow Spring 2010/2018,	$ 1,000,000	Telegraph flood dam, fish passability from ESA 2019, cost
920649	48.78	-122.48	N/A	Squalicum Cr	Cornwall Park ped bridge, old rock pathway		17541	WDFW 01.0552 2.00 +160m from GIS	WS drop	unknown	CH, ST, BT	downstream COB Squal Phases 1 and 2 2015, COB Squal Phases 3 and 4 2020; upstream of COB lower Squal fish barrier improvements near Squal Cr Park	None	upstream of COB Willow Spring 2010/2018 and COB/NSEA lower Squalicum restoration; downstream of Squalicum Re-route Phases 1 and 2 2015; in Tier 1 subwatershed	$ 500,000	rock pathway below existing elevated pedestrain bridge. Parks said manmade, may be considered a historic structure. Alteration needs coord with SHPO
01.0552 2.00	48.78	-122.49	N/A	Squalicum Cr	Meridian St		17381		WS drop	67	CH, ST, BT	downstream COB Squal Ph 1/2 2015, COB Squal Ph 3/4 2020; upstream of COB lower Squal fish barrier improvements near Squal Cr Park	None	upstream of COB Willow Spring 2010/2018 and COB/NSEA lower Squalicum restoration; downstream	$ 1,000,000	Transpo Group estimated $1 million for full width bridge (2019 James St Mulitmodal

CH = Chinook, ST = steelhead, BT = bull trout

Attachment 7: Step 7

STEP 8: Score and rank using COB scoring equation

RANK	Site ID	Lat	Long	Anchor, 2010 ID	Stream	Road Crossing	Total PI 2022 (Form)	Lineal Gain (m)	Barrier Reason	Passability (%)	ESA	Coordination- Barriers	Coordination- Transportation	Benefits	Cost Estimate	Notes	SCORE
1	991104	48.76	-122.51	Squalicum 2	Squalicum Cr	Roeder Ave		38933	tidal influence	unknown	CH, ST, BT	downstream of private McLeod 2007, COB Willow Spring 2010/2018, COB Squal Ph 1/2 2015, COB McLeod2015, WSDOT prioritized 2025, COB Squal Ph 3/4 2020, COBlower Squal restoration sites,	None	downstream of COB Willow Spring 2010/2018, COB Squal Ph 1/2 2015, COB Squal Ph 3/4 2020, COBlower Squal restoration sites; in Tier 1 subwatershed (not within prioritized restoration polygon); project is prioritized BBAT restoration site	$ 4,000,000	10% design COB/Port/BNSF, 3 barrier bundle	16.0
2	994390	48.71932	-122.50717		Padden Cr	footpath; 8th St		13177	insufficient data	unknown	CH, ST		None	downstream of Padden Daylighting and Padden 24th to 30th Ph 1. Teir 1 subwatershed	$ 2,000,000	Lineal gain on WDFW site report appears incorrect, much smaller than 14th St barrier report. Instead used 14th st lineal gain +350+183+374	15.3
3	01.0622 0.30	48.72	-122.5	Padden 3	Padden Cr	10th St	49.64	12803	depth	33	CH, ST		None	downstream of COB 2015 Padden Daylighting and Padden 24th to 30th Ph 1, COB 16th St repair 2016, WSDOT 2014 SR 11, Tier 1 subwatershed, in priority restoration polygon	$ 1,900,000	COB retrofit EV-23. Submit repair to WDFW so shows on database. WDFW re-assessed and still a barrier. Keep on list. Lineal gain on WDFW site report appears incorrect, much smaller than 14th St barrier report. Instead used 14th st lineal gain +350+183	14.8
4	01.0622 0.50	48.72	-122.5	Padden 4	Padden Cr	12th St	49.16	12620	WS drop	33	CH, ST		None	downstream of COB 2015 Padden Daylighting and Padden 24th to 30th Ph 1, COB 16th St repair 2016, WSDOT 2014 SR 11, Tier 1 subwatershed, in priority restoration polygon	$ 1,900,000	replace existing fish ladder and culvert. Submit repair to WDFW so shows on database. Retrofit completed EV-23. WDFW re-assessed and still a barrier. Keep on list. 2022 ESA cost estimate. Lineal gain on WDFW site report appears incorrect, much smaller than 14th St barrier report. Instead used 14th st lineal gain +350	14.8
5	01.0622 0.70	48.72	-122.5	Padden 6	Padden Cr	14th St	48.14	12270	depth	33	CH, ST	downstream of COB 16thSt repair 2016, WSDOT 2014 bridge, 2 WSDOT projects 2022	None	downstream of COB 2015 Padden Daylighting and Padden 24th to 30th Ph 1, Tier 1 subwatershed, in priority restoration polygon	$ 1,570,000	WDFW downloaded list had 67 but barrie	14.7
6	994375	48.72024	-122.50715		Padden Cr	Harris St		13257	insufficient data	unknown	CH, ST		None	downstream of COB 2015 Padden Daylighting and Padden 24th to 30th Ph 1, COB 16th St repair 2016, WSDOT 2014 SR 11, Tier 1 subwatershed, in priority restoration polygon	$ 4,000,000	Lineal gain on WDFW site report appears incorrect, much smaller than 14th St barrier report. Instead used 14th st lineal gain +350+183+374+80	14.3
7	01.0552 2.00	48.78	-122.49	N/A	Squalicum Cr	Meridian St		17381	WS drop	67	CH, ST, BT	downstream COB Squal Ph 1/2 2015, COB Squal Ph 3/4 2020; upstream of COB lower Squal fish barrier improvements near Squal Cr Park. 6-yr TIP	None	upstream of COB Willow Spring 2010/2018 and COB/NSEA lower Squalicum restoration; downstream of Squalicum Re-route Phases 1 and 2 2015; in Tier 1 subwatershed	$ 1,000,000	cost estimated by COB	14.2
8	01.0622 0.80	48.72	-122.5	Padden 7	Padden Cr	16th St	53.96	11942	WS drop	67	CH, ST	downstream of WSDOT 2014 bridge, 2 WSDOT projects 2022	None	downstream of COB 2015 Padden Daylighting, Padden 24th ot 30th Ph 1, COB 16th St repair 2016, WSDOT 2014 SR 11 Tier 1 subwatershed, in priority restoration polygon	$ 1,000,000	Completed repair of pool in 2016. Full fish passage requires replacing fish ladder and culvert.	14.1
9	920649	48.78	-122.48	N/A	Squalicum Cr	Cornwall Park ped bridge, old rock pathway		17541	WS drop	unknown	CH, ST, BT	downstream COB Squal Phases 1 and 2 2015, COB Squal Phases 3 and 4 2020; upstream of COB lower Squal fish barrier improvements near Squal Cr Park	None	upstream of COB Willow Spring 2010/2018 and COB/NSEA lower Squalicum restoration; downstream of Squalicum Re-route Phases 1 and 2 2015; in Tier 1 subwatershed	$ 500,000	rock pathway below existing elevated pedestrain bridge. Parks said manmade, may be considered a historic structure. Alteration needs coord with SHPO	13.7
10	993006	48.78	-122.46	Baker 7	Baker Cr	James St	15.61	6064	other	67	ST	upstream of private McLeod 2007, COB McLeod2015, WSDOT prioritized 2025, COB Willow Spring 2010/2018, COB lower Squal	James St Multimodal project, 2025 at earliest	upstream of COB Baker Cr, COB Willow Spring 2010/2018, COB lower Squal restoration sites;	$ 1,000,000		13.3
11	993881	48.78	-122.46	SF Baker 2	SF Baker Cr	James St	0.00	2050	Slope	33	ST	1 mi upstream of COB barrier improvement on Baker Cr at McLeod 2015, location of the James St Multimodal Study. 6-yr TIP, but no funding thru 2028.	m Orchard to Kellogg thr	wider floodplain	$ 1,000,000	Transpo Group estimated $1 million for full width bridge (2019 James St Mulitmodal Study)	13.3
12	602273	48.77	-122.49	Baker 1	Squalicum Cr	Baker Cr confluence		36708	WS drop	33	CH, ST, BT	downstream of private McLeod 2007, COB Squal Ph 1/2 2015, COB McLeod2015, WSDOT prioritized 2025, COB Squal Ph 3/4 2020; upstream of COB Willow Spring 2010/2018, COB lower Squal restoration sites,	None		$ 4,860,000	flood "dam" (riser). Retrofit completed in 2005 EV-18?? Riser may not have been included in retrofit. 2022 ESA cost estimate	12.7
13	991600	48.7	-122.46	N/A	Padden Cr	Lake Padden	30.88	3533	WS drop	0	ST	upstream of COB 16thSt repair 2016, WSDOT 2014 bridge (9,507), 2 WSDOT projects 2022 (4,250'), 3 City prioritized	None		$ 500,000	at outlet of Lake Padden- dam	11.1
14	992981	48.79	-122.48	Spring 2	Spring Cr	E Bakerview Rd	25.43	7318	velocity	67	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites; downstream of 2001 culvert repair at Van Wyck Rd	None	upstream of Spring Creek restoration site 2004, lower Squal restoration sites, COB Willow Spring 2010/2018, in Tier 1 subwatershed	$ 1,000,000		10.7
15	993038	48.79	-122.46	N/A	Baker Cr	Telegraph Rd		5786	slope	0	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration site, lower Squal restoration sites	None	upstream of lower Squal restoration sites, COB Willow Spring 2010/2018	$ 500,000	immediately upstream to Filippini donation	10.2
16	992656	48.72112	-122.47797		Connelly Cr	Happy Valley Flood Dam, footpath; Mill Ave	12.49	1336	WS drop	0	ST		None	upstream of Padden Daylighting (3698'), Padden 24th to 30th Ph 2 (2655')	$ 1,000,000	passability from WDFW 2021 assessment, ESA conducted assessment for City in 2019 and concluded 67% passability. Cost estimate $600,000 from ESA	10.1
17	993884	48.79	-122.47	Telegraph Detention	NF Baker Cr	Telegraph Flood Dam, Telegraph Rd		1830	other	33	ST, BT	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites	Park development of Bakerview park will triggers road	upstream of lower Squal restoration sites, COB Willow Spring 2010/2018, in Tier 1 subwatershed and in priority restoration polygon	$ 300,000	Telegraph flood dam, fish passability and cost from ESA 2019	9.9
18	992984	48.8	-122.48	Spring 4	Spring Cr	Kellogg Rd	21.03	6516	unknown	unknown	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites	None	upstream of COB Spring Cr restoration site, lower Squal restoration sites, COB Willow Spring 2010/2018; in Tier 1 subwatershed	$ 1,000,000	upstream of Irongate flood dam	9.8
19	991599	48.71	-122.47	Padden 13	Padden Cr	39th St ROW	27.65	3917	slope	0	ST	upstream of 2 WSDOT projects 2022, WSDOT Padden Daylighting	None	upstream of COB 2015 Padden Daylighting 2015, COB 16th St repair 2016, WSDOT 2014 SR 11; in Tier 1 subwatershed, in priority restoration polygon	$ 1,500,000	in Padden Gorge	8.7
20	993093	48.79	-122.45	Hannegan Detention	SF Baker Cr	Hannegan Flood Dam, Strider Lp	24.77	4043	other	67	ST, BT	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Willow Spring 2010/2018, COB lower Squal restoration sites	None	EB Baker Cr restoration site, lower Squal restoration sites,	$ 200,000	Irongate flood dam, fish passability and cost estimate from ESA 2019	8.0
21	993040	48.79	-122.45	Baker 9	Baker Cr	E Bakerview Rd @ Irongate	25.04	5014	depth	33	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, lower Squal restoration sites, COB Willow Spring 2010/2018, upstream of Filippini donation to COB 2018 for restoration	None	downstream of COB Spring Cr restoration site 2004; upstream of lower Squal restoration sites, COB Willow Spring 2010/2018, COB lower Squal restoration sites; in Tier 1 subwatershed and within prioritized restoration polygon	$ 1,000,000		8.0
22	993883	48.79	-122.48	NF Baker 2	Baker Cr	Deemer Rd		2260	slope	33	ST, BT	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites	None	upstream of lower Squal restoration sites, COB Willow Spring 2010/2018	$ 3,000,000	Upstream of long private culvert under Home Depot	7.7
23	920634	48.76	-122.45	N/A	Whatcom Cr	Woburn St		500	slope	0	CH, ST, BT	upstream of Redtail reach, Cemetery Cr restoration, Salmon Park	None	downstream of Boulder Bend and Whatcom Falls Park 1999 restoration; upstream of COB Red Tail Reach, COB Salmon Park, COB Cemetery Cr, COB Whatcom Cr Estuary	$ 4,000,000		7.3
24	994370	48.71	-122.48	Padden 11	Padden Cr	30th St	18.01	1103	slope	33	ST	upstream and downstream of WSDOT projects 2022, upstream of WSDOT 2014 Padden Daylighting	None	upstream of COB 2015 Padden Daylighting 2015, COB 16th St repair 2016, WSDOT 2014 SR 11; in Tier 1 subwatershed, in priority restoration polygon	$ 4,830,000	2022 ESA cost estimate	7.2
25	993443	48.8	-122.44	Baker 12	Baker Cr	Hannegan Rd	18.26	3457	velocity	67	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration site, lower Squal restoration sites	proposed secondary arterial	upstream of COB Willow Spring 2010/2018, COB lower Squal restoration sites, COB planned restoration at Filippini, COB restoration at Baker Cr; in Tier 1 subwatershed	$ 1,000,000	upstream of Irongate flood dam	6.5
26	993821	48.8	-122.44	Baker 13	Baker Cr	Hannegan Rd	22.6	2993	slope	33	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration site, lower Squal restoration sites	None	upstream of COB Willow Spring 2010/2018, COB lower Squal restoration sites, COB planned restoration at Filippini, COB restoration at Baker Cr	$ 1,000,000	upstream of Irongate flood dam and other culverts	6.2
27	993483	48.71	-122.49	Hoags 3	Hoags Cr	Interurban Trail	17.81	283	slope	33			None	in Tier 1 subwatershed, in priority restoration polygon	$ 250,000	assume WSDOT prioritized list for Chuckanut Cr barrier impr. Is mainstem, not Hoags Creek), Parks funds?	6.1
28	993482	48.71	-122.48	Hoags 4	Hoags Cr	25th St	17.78	263	slope	33	ST		None	in Tier 1 subwatershed, in priority restoration polygon	$ 500,000		6.1
29	370649	48.73	-122.45	W Cemetery 5	Cemetery Cr	San Juan Blvd		220	slope	0			None	upstream of COB 2006 Red Tail Reach, COB Whatcom Creek Estuary, planned W Cemetery Cr	$ 500,000		6.1
30	370683	48.74	-122.44	W Cemetery 3	W Cemetery Cr	Old Lakeway Dr		1980	WS drop	0		upstream of COB W Cemetery restoration project 2022	ES-0547 2019 TBD project, creating a 10-foot wide two-way bicycle connection at Lakeway/Old Lakeway, at this culvert crossing this is just striping/SLMs on the roadway – no excavation or roadway work, so COB not planning on doing anything with this culvert	upstream of COB 2006 Red Tail Reach, COB Whatcom Creek Estuary, planned W Cemetery Cr WQ improvements	$ 1,000,000		5.6
31	370648	48.74	-122.44	W Cemetery 4	Cemetery Cr	Lopez St		1318	slope	0			None	upstream of COB 2006 Red Tail Reach, COB Whatcom Creek Estuary	$ 500,000		5.4
32	1280163	48.81	-122.5	N/A	E Bear Cr	Horton Flood Dam		2500	rack	unknown		1.5 mi upstream of City Mitigation Bank site (Bear Cr), 1.5 mi upstream of Whatcom County planned improvement for barrier 1280204	None	1.5 mi upstream of City Mitigation Bank site (Bear Cr), 1.5 mi upstream of Whatcom County planned improvement for barrier 1280204	$ 600,000	Horton flood dam, ESA 2019 cost estimate	5.1
33	370678	48.75	-122.46	Lincoln 5	Lincoln Cr	Lincoln St		2590	slope	33		upstream of multiple Whatcom Cr downtown riparian projects	None	upstream of COB 2006 Red Tail Reach, COB Whatcom Creek Estuary	$ 1,000,000	downstream of fred meyer tunnel.	4.8
34	370679	48.75	-122.45	Magnolia 1	E Cemetery Cr	Woburn St		120	WS drop	0			None	upstream of COB 2006 Red Tail Reach, COB Whatcom Creek Estuary	$ 5,000,000	upstream of natural barrier 920643	4.0
35	370658	48.75	-122.45	W Cemetery 2	W Cemetery Cr	Lakeway Dr		2141	slope	0		upstream of COB W Cemetery restoration project 2022	None	upstream of COB 2006 Red Tail Reach, COB Whatcom Creek Estuary	$ 5,000,000	PW Ops concerned about integrity of road due to culvert failure	3.6

CH = Chinook, ST = steelhead, BT = bull trout