



Public Works Department City of Bellingham

TECHNICAL MEMORANDUM

To: Renée LaCroix, Assistant Public Works Director, Natural Resources Division
From: Analiese Burns, Habitat and Restoration Manager
Subject: 2019 City of Bellingham Fish Barrier Prioritization Update
Date: December 15, 2019

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. The City has developed and used prioritization tools to plan for these fish passage improvement projects.

Purpose

This fish barrier prioritization updates prior prioritization efforts with the purpose of identifying high priority barrier improvement projects for planning and implementation. More specifically, the prioritization update is intended to:

- Incorporate the most current Washington Department of Fish and Wildlife (WDFW) barrier assessments;
- Update prioritization methodology consistent with the *Fish Passage Inventory, Assessment and Prioritization Manual* (WDFW, 2019c);
- Reflect barrier improvements completed since 2009;
- Aid in incorporating prioritized culverts in City utility and transportation planning;
- Aid in coordinating City barrier improvements with Washington State Department of Transportation (WSDOT) planned barrier improvements; and
- Aid in coordinating City barrier improvements with other barrier improvements conducted as part of the Water Resource Area (WRIA) 1 Salmon Recovery Plan.

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

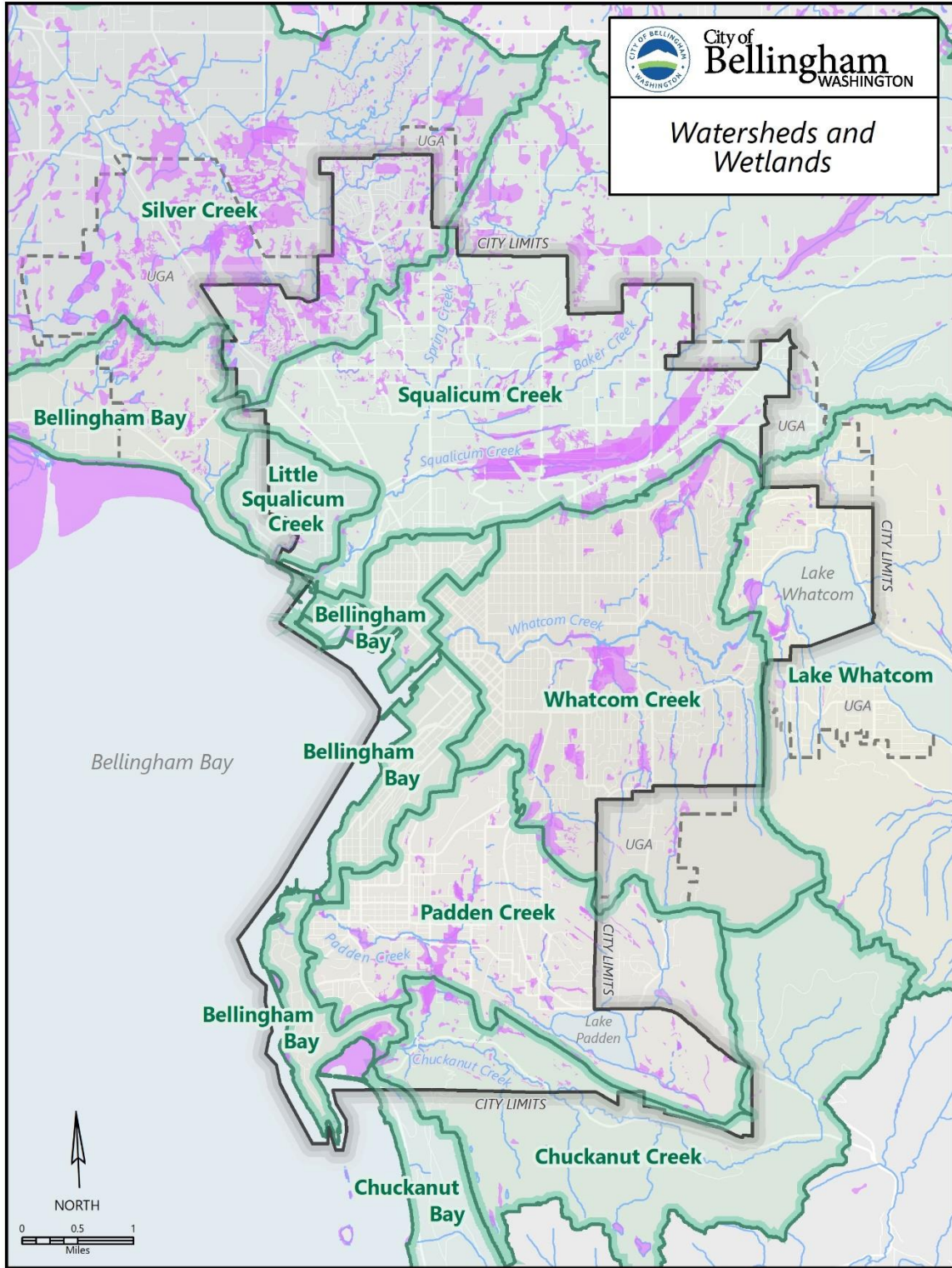


Figure 1. Bellingham Watersheds

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 barrier assessment data used in the 2010 prioritization and 2012 addendum became outdated when the WDFW updated barrier data in a 2014 city-wide 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 City of Bellingham was one of the select communities chosen for a full barrier inventory. This 2014 inventory, together with subsequent WDFW inventory updates, are available on WDFW's Fish Passage and Diversion Screening Inventory (FPDSI) database (WDFW, 2019a).

In this 2019 City of Bellingham update, the prioritization incorporates the results of the 2014 WDFW full barrier inventory and more recent barrier assessments documented on the FPDSI database. The prioritization is also designed to be consistent with the most recent WDFW prioritization methodology as described in the *Fish Passage Inventory, Assessment and Prioritization Manual* (WDFW, 2019c).

Incorporating the most recent WDFW barrier assessments and prioritization methodology allows improved consistency between the City, State, and a concurrent culvert evaluation effort by Whatcom County.

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. Participants included 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.

Scope and Methodology

The current prioritization 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 to fully fish passable.

STEPS 1 -6: 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 \geq lowest score identified in 2 (PI score \geq 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

The table below shows the maximum possible scores in each category and the percent contribution to the maximum possible score.

Table 1. 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:

- 0 meters = 0
- ≥1 and ≤ 300 meters = 1
- 301-1,600 meters = 2
- ≥1,600 meters = 3

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

Based on SaSI as shown in SalmonScape (WDFW, 2019b)

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 2025

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

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

Presence assumed if barrier is downstream of natural fish passage barrier.

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 2019 prioritization are included in Attachments 1 - 7. The final barriers prioritized for improvement in 2019 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: 2 barriers removed: 1 barrier is state owned and no longer documented by WDFW as a fish passage barrier and 1 barrier improvement has already been completed.

8 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 \geq lowest score identified in 2 (PI score \geq 15.48).

Results: 11 barriers added, then 2 of these 11 removed because barrier improvements were completed. 16 barriers remain

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 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).

Results: 19 barriers added, then 3 of these 19 removed because barrier improvements were completed. 1 barrier (920649) removed because City believes barrier is natural, needs confirmation (update as necessary in future prioritization).

31 barriers remain

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.

32 barriers remain

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 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).

Results: Updated or calculated lineal gain on 14 barriers. Updated passability on 2 barriers. Updated bull trout presence on 4 barriers. No barriers removed.

32 barriers remain

STEP 7. Score and rank all culverts on the Draft Priority List from step 7 using the Prioritization Equation.

Results: 32 barriers, ranked. Scores range from 14.7 to 5.0. See summary in Table 2 and Figure 2.

Table 2. 2019 City of Bellingham Prioritized Fish Passage Barriers

RANK	Site ID	Stream	Road Crossing	Total PI (WDFW Form)	Lineal Gain (m)	Passability (%)	ESA*	SCORE
1	993881	SF Baker Cr	James St	0.00	3,084	unknown	ST, BT	15.7
2	602273	Squalicum Cr	Baker Cr confluence	unknown	36,708	33	CH, ST, BT	14.7
3	993006	Baker Cr	James St	15.61	6,064	67	ST	14.2
4	01.0622 0.80	Padden Cr	16th St	53.96	11,942	67	CH, ST	14.0
5	991104	Squalicum Cr	Roeder Ave	unknown	38,933	unknown	CH, ST, BT	14.0
6	01.0622 0.70	Padden Cr	14th St	48.14	3,701	67	CH, ST	13.5
7	991600	Padden Cr	Lake Padden	30.88	3,533	0	ST	13.5
8	993884	NF Baker Cr	Telegraph Rd Telegraph Flood Dam	unknown	1,830	33	ST, BT	13.3
9	01.0552 2.00	Squalicum Cr	Meridian St	unknown	17,381	67	CH, ST, BT	13.2
10	992984	Spring Cr	Kellogg Rd	21.03	6,516	unknown	ST, BT	12.8
11	992981	Spring Cr	E Bakerview Rd	25.43	7,318	67	ST, BT	12.7
12	993038	Baker Cr	Telegraph Rd	unknown	5,786	0	ST	12.5
13	01.0559 0.10	Trib W, Squalicum Cr	Meridian St	unknown	0	67	CH, ST, BT	11.8
14	993880	SF Baker Cr	E McLeod Rd	15.48	1,984	unknown	ST, BT	11.7
15	994370	Padden Cr	30th St	18.01	1,103	33	ST, BT	11.3
16	991599	Padden Cr	39th St ROW	27.65	3,917	0	ST	11.0
17	993883	Baker Cr	Deemer Rd	unknown	2,260	33	ST, BT	11.0
18	993093	SF Baker Cr	Strider Lp Hannegan Flood Dam	24.77	4,043	67	ST, BT	9.8

19	993040	Baker Cr	E Bakerview Rd @ Irongate	25.04	5,014	33	ST	9.5
20	370678	Lincoln Cr	Lincoln St	unknown	2,440	33		9.0
21	993443	Baker Cr	Hannegan Rd	18.26	3,457	67	ST	8.5
22	993821	Baker Cr	Hannegan Rd	22.6	2,993	33	ST	8.3
23	920634	Whatcom Cr	Woburn St	unknown	500	0	CH, ST, BT	8.2
24	370683	W Cemetery Cr	Old Lakeway Dr	unknown	2,100	0		8.0
25	370648	Cemetery Cr	Lopez St	unknown	1,110	0		8.0
26	370658	W Cemetery Cr	Lakeway Dr	unknown	2,260	0		8.0
27	993482	Hoags Cr	25th St	17.78	263	33	ST	7.0
28	993484	Hoags Cr		16.9	263	0		7.0
29	993483	Hoags Cr	Interurban Trail	17.81	283	33		7.0
30	1280163	E Bear Cr	Horton Flood Dam	unknown	810	67		6.8
31	370649	Cemetery Cr	San Juan Blvd	unknown	220	0		6.0
32	370679	E Cemetery Cr	Woburn St	unknown	120	0		5.0

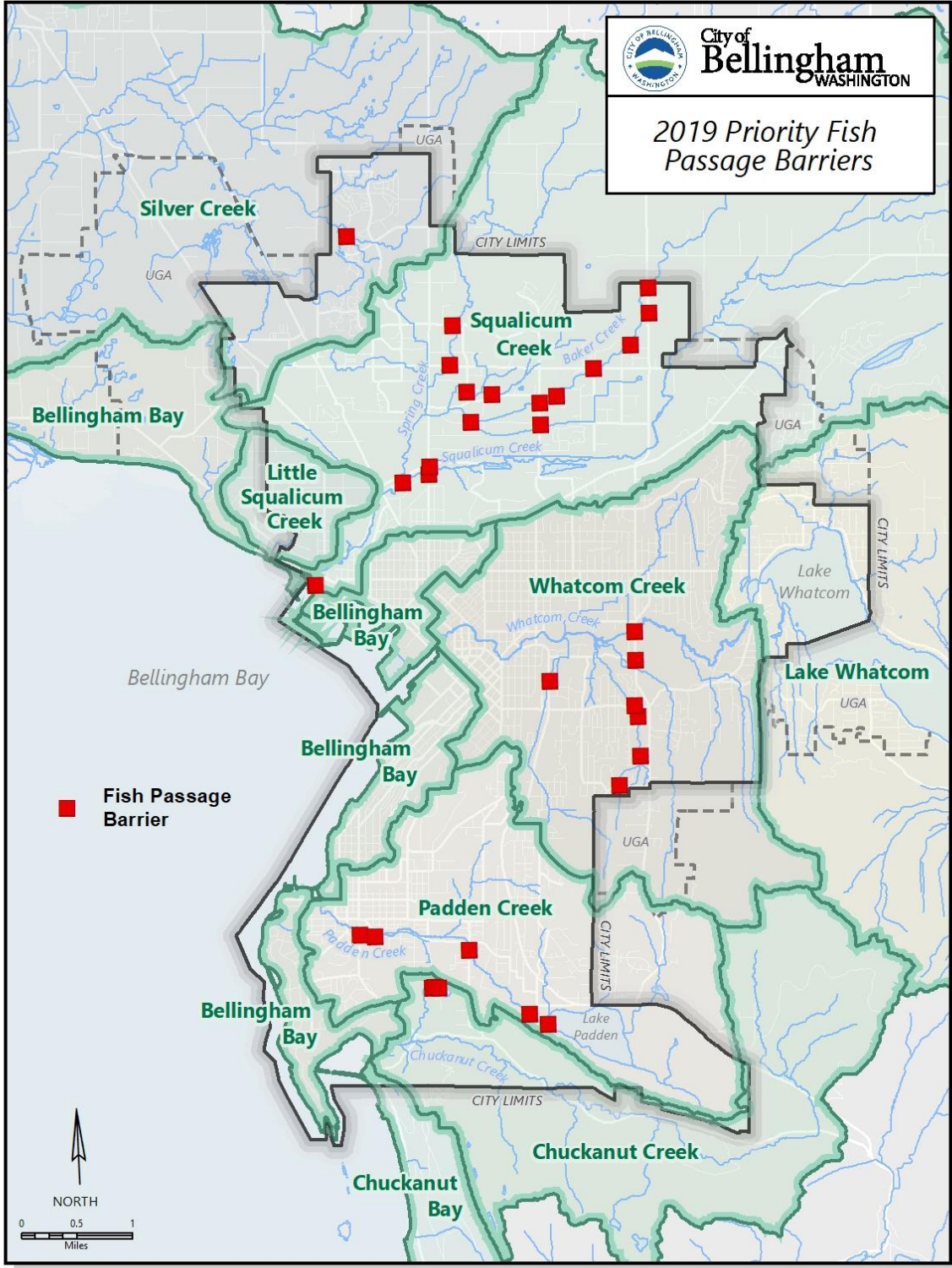


Figure 2. 2019 City of Bellingham Priority Fish Passage Barriers

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 an annual update to the prioritization data and ranked barrier list.

Literature Cited

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Washington State Department of Transportation, 2019. 2019 Delivery Plan. Online at [\[https://www.wsdot.wa.gov/construction-planning/project-delivery-plan\]/](https://www.wsdot.wa.gov/construction-planning/project-delivery-plan/) Accessed August 2019. [Cited in text as WSDOT, 2019]

Whatcom County Public Works, 2006. Whatcom County Fish Passage Barrier Inventory Final Report, IAC Project Number 01-1258 N. Bellingham, Washington.

Attachment 1: Step 1

STEP 1: Create a Draft Priority List consisting of the top 10 City-owned barriers (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.

	Site ID	Stream	Road Crossing	Total PI 2016 (Form)	Lineal Gain (m)	Barrier Reason	Passability (%)	ESA*	Notes
1	992979	Baker Cr	unknown	25.69					
2	992981	Spring Cr	E Bakerview Rd	25.43	7318	velocity	67	ST	
3	993093	SF Baker Cr	Strider Lp	24.77	4043	other	0	ST, BT	Irongate flood dam
4	992984	Spring Cr	Kellogg Rd	21.03	6516	unknown	unknown	ST	upstream of Irongate flood dam
5	993443	Baker Cr	Hannegan Rd	18.26	3457	velocity	67	ST	upstream of Irongate flood dam
6	993110	Baker Cr	Hannegan Rd	18.26			67		
7	993821	Baker Cr	Hannegan Rd	17.61	2993	slope	33	ST	upstream of Irongate flood dam and other culverts
8	993880	SF Baker Cr	E McLeod Rd	15.48	1984			ST	
9	993006	Baker Cr	James St	14.12	6064	other	67	ST	
10	993487	Hoags Cr	Hoags Pond trail	13.85	100		0	ST	

*ESA species benefiting (as documented on WDFW fish barrier field form): CH = Chinook, ST = steelhead, BT = bull trout

Attachment 2: Step 2

STEP 2: Update PI scores, other stats using FPDSI database										
Site ID	Stream	Road Crossing	Total PI 2019 (Form)	Lineal Gain (m)	Barrier Reason	Passability (%)	ESA*	Notes		
1	992978	Spring Creek	SR 539	22.64	9015	depth	67	ST	No record of this culvert on WDFW map, believe it is error and should be 992978, state owned. Remove from list.	
2	992981	Spring Cr	E Bakerview Rd	25.43	7318	velocity	67	ST		
3	993093	SF Baker Cr	Strider Lp	24.77	4043	other	0	ST, BT	Irongate flood dam	
4	993821	Baker Cr	Hannegan Rd	22.6	2993.00	slope	33.00	ST	upstream of Irongate flood dam and other culverts	
5	992984	Spring Cr	Kellogg Rd	21.03	6516	unknown	unknown	ST	upstream of Irongate flood dam	
6	993443	Baker Cr	Hannegan Rd	18.26	3457	velocity	67	ST	upstream of Irongate flood dam	
7	993006	Baker Cr	James St	15.61	6064	other	67	ST		
8	993880	SF Baker Cr	E McLeod Rd	15.48	1984		unknown	ST		
*ESA species benefiting (as documented on WDFW fish barrier field form): CH = Chinook, ST = steelhead, BT = bull trout										
REMOVED IN THIS STEP										
1	993487	Hoags Cr	Hoags Pond trail	0	100	N/A	100	ST	dam, repaired as of 2011	
2	993110	Baker Cr		0		N/A	100		no longer listed as a barrier, remove from list	

Attachment 3: Step 3

STEP 3: Add barriers on City property or ROW from FPDSI database with PI score \geq lowest PI score from Step 2 (PI score \geq 15.48)										
Site ID	Stream	Road Crossing	Total PI 2019 (Form)	Lineal Gain (m)	Barrier Reason	Passability (%)	ESA*	Notes		
1 01.0622 0.80	Padden Cr	16th St	53.96	11942	WS drop	67	CH, ST			
2 01.0622 0.70	Padden Cr	14th St	48.14	3701	depth	67	CH, ST			
3 991600	Padden Cr	Lake Padden	30.88	3533	WS drop	0.00	ST			
4 991599	Padden Cr	39th St ROW	27.65	3917	slope	0.00	ST			
5 992981	Spring Cr	E Bakerview Rd	25.43	7318	velocity	67	ST			
6 993040	Baker Cr	E Bakerview Rd	25.04	5014	depth	33	ST			
7 993093	SF Baker Cr	Strider Lp	24.77	4043	other	0	ST, BT	Irongate flood dam		
8 993821	Baker Cr	Hannegan Rd	22.6	2993	slope	33.00	ST	upstream of Irongate flood dam and other culverts		
9 992984	Spring Cr	Kellogg Rd	21.03	6516	unknown	unknown	ST	upstream of Irongate flood dam		
10 993443	Baker Cr	Hannegan Rd	18.26	3457	velocity	67	ST	upstream of Irongate flood dam		
11 994370	Padden Cr	30th St	18.01	1103	slope	33	ST			
12 993483	Hoags Cr	Interurban Trail	17.81	283	slope	33				
13 993482	Hoags Cr	25th St	17.78	263	slope	33	ST			
14 993484	Hoags Cr		16.9	263	slope	0				
15 993006	Baker Cr	James St	15.61	6064	other	67	ST			
16 993880	SF Baker Cr	E McLeod Rd	15.48	1984		unknown	ST			
*ESA species benefiting (as documented on WDFW fish barrier field form): CH = Chinook, ST = steelhead, BT = bull trout										
REMOVED IN THIS STEP										
1 01.0622 0.30	Padden Cr	10th St	49.64	3445	depth	67	CH, ST	COB retrofit EV-23. Submit repair to WDFW so shows on database. Remove from list.		
2 01.0622 0.50	Padden Cr	12th St	49.16	4023	WS drop	67	CH, ST	Retrofit completed EV-23. Submit repair to WDFW so shows on database. Remove from list.		

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 2025 (and not above a natural barrier).

Site ID	Stream	Road Crossing	Total PI 2019 (Form)	Lineal Gain (m)	Barrier Reason	Passability (%)	ESA*	Coordination	Notes
1	01.0622	0.80	Padden Cr	16th St	WS drop	67	CH, ST		
2	01.0622	0.70	Padden Cr	14th St	depth	67	CH, ST		
3	991600		Lake Padden		WS drop	0.00	ST		
4	991599		Padden Cr	39th St ROW	slope	0.00	ST		
5	992981		Spring Cr	E Bakerview Rd	velocity	67	ST		
6	993040		Baker Cr	E Bakerview Rd	depth	33	ST		
7	993093		SF Baker Cr	Strider Lp	other	0	ST, BT		Irongate flood dam upstream of Irongate flood dam and other culverts
8	993821		Baker Cr	Hannegan Rd	slope	33.00	ST		upstream of Irongate flood dam
9	992984		Spring Cr	Kellogg Rd	unknown	unknown	ST		upstream of Irongate flood dam
10	993443		Baker Cr	Hannegan Rd	velocity	67	ST		
11	994370		Padden Cr	30th St	slope	33	ST		
12	993483		Hoags Cr	Interurban Trail	slope	33	ST		
13	993482		Hoags Cr	25th St	slope	33	ST		
14	993484		Hoags Cr		slope	0	ST		
15	993006		Baker Cr	James St	other	67	ST		
16	993880		SF Baker Cr	E McLeod Rd	unknown	unknown	ST		Transpo Group estimated \$1 million for full width
17	993881		SF Baker Cr	James St	unknown	unknown	ST		1 mi upstream of COB barrier improvement on Baker Cr at McLeod 2015, location of the James St Multimodal Study
18	1280163		E Bear Cr	N/A	velocity	67			1.5 mi upstream of City Mitigation Bank site (Bear Cr), 1.5 mi upstream of Whatcom County planned improvement for barrier 1280204
19	370683		W Cemetery Cr	Old Lakeway Dr	WS drop	0			
20	370648		Cemetery Cr	Lopez St	slope	0			
21	370658		W Cemetery Cr	Lakeway Dr	slope	0			
22	370679		E Cemetery Cr	Woburn St	WS drop	0			
23	370649		Cemetery Cr	San Juan Blvd	slope	0			
24	991104		Squalicum Cr	Roeder Ave	tides	unknown	CH, ST, BT		downstream of private McLeod 2007, COB Willow Spring 2010/2018, COB Squal Ph 1/2 2015, COB McLeod 2015, WSDOT prioritized 2025, COB Squal Ph 3/4 2020, COB lower Squal restoration sites, WSDOT prioritized 2025, COB Squal Ph 1/2 2015, COB McLeod 2015, WSDOT prioritized 2025, COB Squal Ph 3/4 2020, COB lower Squal restoration sites, WSDOT prioritized 2025, COB Squal Ph 1/2 2015, COB McLeod 2015, WSDOT prioritized 2025, COB Squal Ph 3/4 2020, upstream of COB Willow Spring 2010/2018, COB lower Squal restoration sites, COB Squal Ph 3/4 2020, upstream of COB Red Tail Reach, COB Salmon Park, COB Cemetery Cr, COB Whatcom Cr Estuary
25	602273		Squalicum Cr	Baker Cr confluence	WS drop	33	CH, ST, BT		need to confirm 0% passability
26	920634		Whatcom Cr	Woburn St	slope	0	CH, ST, BT		adjacent to Filippini donation
27	993038		SF Baker Cr	Telegraph Rd	slope	0	ST		downstream of Telegraph flood dam
28	993883		Baker Cr	Deemer Rd	slope	33	ST, BT		
29	993884		Baker Cr	Telegraph Rd	other	67	ST, BT		Telegraph flood dam
30	01.0552 2.00		Squalicum Cr	Meridian St	WS drop	67	CH, ST, BT		lineal gain based on WDFW decision that Trib
31	01.0559 0.10		Trib W, Squalicum Cr	Meridian St	WS drop	67	CH, ST, BT		
*ESA species benefiting (as documented on WDFW fish barrier field form): CH = Chinook, ST = steelhead, BT = bull trout									
REMOVED IN THIS STEP									
1	920649		Squalicum Cr	prnwall Park ped bridge	WS drop	unknown	CH, ST, BT		Believe is a natural rock barrier. Remove from list, but confirm in field.
2	991105		Squalicum Cr	West St	velocity	33	CH, ST, BT		Retrofit completed in 2005 EV-18. WDFW AHB confirmed low priority, retrofit addressed primary species/timing. Submit repair to WDFW so shows on database. Remove from list.
3	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. Submit repair to WDFW so shows on database. Remove from list.
4	1280168		Bear Creek	Mahogany Ave	slope	67	ST		City installed box culvert 2018 (ES-489). Remove from list.

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 2019 (Form)	Lineal Gain (m)	Barrier Reason	Passability (%)	ESA*	Coordination	Notes
1	01.0622	0.80	Padden 7	53.96	11942	WS drop	67	CH, ST		
2	01.0622	0.30	Padden 3	49.64	3445	depth	67	CH, ST		
3	01.0622	0.50	Padden 4	49.16	4023	WS drop	67	CH, ST		
4	01.0622	0.70	Padden 6	48.14	3701	depth	67	CH, ST		
5	991600	N/A	Padden Cr	30.88	3533	WS drop	0.00	ST		
6	991599	Padden 13	39th St ROW	27.65	3917	slope	0.00	ST		
7	992981	Spring Cr	E Bakerview Rd	25.43	7318	velocity	67	ST		
8	993040	Baker Cr	E Bakerview Rd	25.04	5014	depth	33	ST		
9	993093	Hannegan Detention	Strider Lp	24.77	4043	other	0	ST, BT		Irongate flood dam upstream of Irongate flood dam and other culverts
10	993821	Baker 13	Hannegan Rd	22.6	2993	slope	33.00	ST		upstream of Irongate flood dam
11	992984	Spring 4	Kellogg Rd	21.03	6516	unknown	unknown	ST		upstream of Irongate flood dam
12	993443	Baker 12	Hannegan Rd	18.26	3457	velocity	67	ST		
13	994370	Padden 11	30th St	18.01	1103	slope	33	ST		
14	993483	Hoags 3	Interurban Trail	17.81	283	slope	33	ST		
15	993482	Hoags 4	25th St	17.78	263	slope	33	ST		
16	993484	Hoags 5		16.9	263	slope	0	ST		
17	993006	Baker 7	James St	15.61	6064	other	67	ST		
18	993880	SF Baker 1	E McLeod Rd	15.48	1984		unknown	ST		
19	370678	Lincoln 5	Lincoln St	unknown						
20	993881	SF Baker 2	James St	unknown	3084	slope	unknown	ST		1 mi upstream of COB barrier improvement on Baker Cr at McLeod 2015, location of the James St Multimodal Study
21	1280163	E Bear Cr		unknown		velocity	67			1.5 mi upstream of City Mitigation Bank site (Bear Cr), 1.5 mi upstream of Whatcom County planned improvement for barrier 1280204
22	370683	W Cemetery 3	N/A	unknown		WS drop	0			Horton flood dam
23	370648	W Cemetery 4	Old Lakeway Dr	unknown		slope	0			
24	370658	W Cemetery 2	Lopez St	unknown		slope	0			
25	370679	W Cemetery 1	Lakeway Dr	unknown		slope	0			
26	370649	W Cemetery 5	Woburn St	unknown		WS drop	0			
27	991104	Squalicum 2	San Juan Blvd	unknown		slope	0			downstream of private McLeod 2007, COB Willow Spring 2010/2018, COB Squal Ph 1/2 2015, COB McLeod 2015, WSDOT prioritized 2025, COB Squal Ph 3/4 2020, COB lower Squal restoration sites
28	602273	Baker 1	Roeder Ave	unknown		tides	unknown	CH, ST, BT		Renew: Partial design COB/Port, \$millions
29	920634	N/A	Baker Cr confluence	unknown		WS drop	33	CH, ST, BT		flood "dam" (weir) need to confirm 0% passability
30	993038	N/A	Woburn St	unknown		slope	0	CH, ST, BT		adjacent to Filippini donation
31	993883	NF Baker 2	Telegraph Rd	unknown	5786	slope	0	ST		upstream of Telegraph flood dam
32	993884	Telegraph Detenti	Deemer Rd	unknown		slope	33	ST, BT		downstream of Telegraph flood dam
33	01.0552	2.00	Telegraph Rd	unknown	17381	other	67	ST, BT		Telegraph flood dam
34	01.0559	0.10	Meridian St	unknown		WS drop	67	CH, ST, BT		lineal gain based on WDFW decision that Trib W not suitable fish habitat in Squal Re-route Ph 1-2
*ESA species benefiting (as documented on WDFW fish barrier field form): CH = Chinook, ST = steelhead, BT = bull trout										
REMOVED IN THIS STEP										
1	unknown	Spring 3	Prince St	0	7032	N/A	100	ST		100% passable, not a barrier. Remove from list.
2	370673	Lincoln 1	Frasier St	unknown		unknown	unknown	CH, ST, BT		Mis-labeled as COB, should be private. Submitted correction to WDFW 3/18/19. Remove from list.

Attachment 6: Step 6

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	Notes
602273	-122.49	-122.49	Baker 1	Squalicum Cr	Baker Cr confluence	unknown	36708	WDRW 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 McLeod 2015, WSDOT prioritized 2025, COB Squal Ph 3/4 2020; upstream of COB Willow Spring 2010/2018, COB lower Squal restoration sites.	None	flood "dam" (rice), benefit completed in 2005 EV-18. Ecor only let have been included in retrofit. Minor adjustment to riser?
01.0622	-122.5	-122.5	Padden 6	Padden Cr	14th St	48.14	3701		depth	67	CH, ST	downstream of COB 16HIS repair 2016, WSDOT 2014 bridge, WSDOT prioritized project 2025	None	Transpo Group estimated \$1 million for full width bridge (2019)
01.0552	-122.49	-122.49	N/A	Squalicum Cr	Meridian St	unknown	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	James St Multimodal project, 2025 at earliest
993006	-122.46	-122.46	Baker 7	Baker Cr	James St	15.61	6064		other	67	ST	upstream of private McLeod 2007, COB McLeod 2015, WSDOT prioritized 2025, COB Willow Spring 2010/2018, COB lower Squal restoration sites	None	Completed repair of pool in 2016. Full fish passage requires replacing fish ladder and culvert.
01.0622	-122.5	-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	Horton flood dam
1280163	-122.5	-122.5	N/A	E Bear Cr	Horton Flood Dam	unknown	810	GIS measure	velocity	67		1.5 mi upstream of City Mitigation Bank site (Bear Cr), 1.5 mi upstream of Whatcom County planned improvement for barrier 1580204	None	Immediately upstream to Filippini donation at outlet of Lake Padden-dam
993038	-122.46	-122.46	N/A	SF Baker Cr	Telegraph Rd	unknown	5786		slope	0	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration site, lower Squal restoration sites	None	none
991600	-122.46	-122.46	N/A	Padden Cr	Lake Padden	30.88	3533		WS drop	0	ST	upstream of COB 16HIS repair 2016, WSDOT 2014 bridge (9.500'), 2 WSDOT prioritized projects 2025 (4.250')	none	Irrigation flood dam, fish passability from ESA 2019
993093	-122.45	-122.45	Hannagan Detention	SF Baker Cr	Strider Ln	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	upstream of long private culvert under Home Depot in Padden Gorge
993883	-122.48	-122.48	NF Baker 2	Baker Cr	Dremer Rd	unknown	2260	GIS measure	slope	33	ST, BT	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites	None	upstream of irongate flood dam
991599	-122.47	-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 irongate flood dam
992984	-122.48	-122.48	Spring 4	Spring Cr	Kellogg Rd	21.03	6516		unknown	unknown	ST, BT	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites	None	upstream of irongate flood dam
992981	-122.48	-122.48	Spring 2	Spring Cr	E Bakerview Rd	25.43	7318		velocity	67	ST, BT	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites, downstream of 2001 culvert repair at Van Wack Rd	None	James St Multimodal project, 2025 at earliest
993880	-122.48	-122.48	SF Baker 1	SF Baker Cr	E McLeod Rd	15.48	1984		unknown	unknown	ST, BT	upstream of private McLeod 2007, COB McLeod 2015, WSDOT prioritized 2025, COB Willow Spring 2010/2018, COB lower Squal restoration sites	none	Partial design COB/port
993881	-122.46	-122.46	SF Baker 2	SF Baker Cr	James St	unknown	3084		unknown	unknown	ST, BT	1 mi upstream of COB barrier improvement on Baker Cr at McLeod 2015, location of H	James St Multimodal project, 2025 at earliest	Transpo Group estimated \$1 million for full width bridge (2019)
991104	-122.51	-122.51	Squalicum 2	Squalicum Cr	Roeder Ave	unknown	38933	WDRW 01.0552	tides	unknown	CH, ST, BT	downstream of private McLeod 2007, COB Willow Spring 2010/2018, COB Squal Ph 1/2 2015, COB McLeod 2015, WSDOT prioritized 2025, COB Squal Ph 3/4 2020.	None	
993040	-122.45	-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	
993884	-122.47	-122.47	Telegraph Detention	NF Baker Cr	Telegraph Rd	unknown	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	Telegraph flood dam, fish passability from ESA 2019
01.0559	-122.44	-122.44	N/A	H.W. Squalicum Baker Cr	Meridian St Hannagan Rd	18.26	3457	See notes	WS drop velocity	67	CH, ST, BT	upstream of COB lower Squal fish barrier improvements near Squal Cr Park	ES-0551 Meridian/Birchwood/Squalicum roundabout study, proposed secondary arterial	lineal gain based on WDRW decision that Trib W not suitable fish habitat in Squal-Re-route Ph 1-2
994370	-122.48	-122.48	Padden 11	Padden Cr	30th St	18.01	5317	GIS measure + WDRW 991599	slope	33	ST	upstream and downstream of WSDOT prioritized 2025, upstream of WSDOT 2014 Padden Daylighting	none	upstream of irongate flood dam
993821	-122.44	-122.44	Baker 13	Baker Cr	Hannagan 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 irongate flood dam and other culverts
370683	-122.44	-122.44	W Cemetery 3	W Cemetery Cr	Old Lakeway Dr	unknown	2100	GIS measure	WS drop	0			ES-0547 2019 TBD project, creating a none	
370648	-122.44	-122.44	W Cemetery 4	Cemetery Cr	Lopez St	unknown	1110	GIS measure from Old Lakeway	slope	0				
920634	-122.45	-122.45	N/A	Whatcom Cr	Woburn St	unknown	500	GIS measure to natural barrier	slope	0	CH, ST, BT		None	Ask WDRW, confirm 0% passability
370678	-122.46	-122.46	Lincoln 5	Lincoln Cr	Lincoln St	unknown	2440	GIS measure	slope	33			none	downstream of Fred Meyer tunnel.
370679	-122.45	-122.45	Magnolia 1	E Cemetery Cr	Woburn St	unknown	0	GIS measure from Old Lakeway	WS drop	0			none	upstream of natural barrier 920643
993483	-122.49	-122.49	Hoggs 3	Hoggs Cr	Interurban Trail	17.81	283		slope	33			None	assume WSDOT prioritized list for Chuckanut Cr barrier impr. (mainstem, not Hoags Creek)
993482	-122.48	-122.48	Hoggs 4	Hoggs Cr	25th St	17.78	263		slope	33	ST		None	
993484	-122.48	-122.48	Hoggs 5	Hoggs Cr		16.9	263		slope	0			None	
370649	-122.45	-122.45	W Cemetery 5	Cemetery Cr	San Juan Blvd	unknown	0	GIS measure	slope	0			none	
370658	-122.45	-122.45	W Cemetery 2	W Cemetery Cr	Lakeway Dr	unknown	2260	GIS measure from Old Lakeway	slope	0			none	

*ESA species benefitting (as documented on WDRW fish barrier field form): CH = Chinook, ST = steelhead, BT = Bull trout

Attachment 7: Step 7

RANK	Site ID	Lat	Long	And/or_2000 ID	Stream	Road Crossing	Total PI 2019 (form)	Uveal Gain (in)	Barrier Reason	Passability (%)	ESA*	Coordination- Barriers	Coordination- Transportation	Benefits	Cost Estimate	Notes	SCORE
1	993881	-48.78	-122.46	SF Baker 2	SF Baker Cr	James St	unknown	3084	unknown	unknown	ST, BT	1 m upstream of COB barrier improvement on Baker Cr at McLeod 2015, location of James St Wetland Study	James St Multi-modal project 2025 is called	Wider floodplain	\$ 1,000,000	Transpo Group estimated \$1 million for 2018 James St Multimodal flood 'tunn' (sew) retrofit, completed in 2005 by 16. Reser may not have been included in report. Minor adjustment to user.	15.7
2	602713	-48.71	-122.49	Baker 1	Squalicum Cr	Baker Cr confluence	unknown	36708	WS drop	33	CH, ST, BT	downstream of private McLeod 2007, COB Squal Ph 1/2 2015, COB McLeod 2015, WSDOT prioritized 2025, COB Squal Ph 3/4 2020, upstream of COB Willow Spring 2010/2018, COB lower Squal restoration sites.	None	upstream of COB Baker Cr, COB Willow Spring 2010/2018, COB lower Squal restoration sites; upstream of COB planned restoration at Filippih; in Tier 1, subwatershed, in priority restoration polygon.	\$ 200,000		14.7
3	993006	-48.78	-122.48	Baker 7	Baker Cr	James St	15.61	6064	other	67	ST	upstream of private McLeod 2007, COB McLeod 2015, WSDOT prioritized 2025, COB Willow Spring 2010/2018, COB lower Squal restoration sites.	James St	upstream of COB Baker Cr, COB Willow Spring 2010/2018, COB lower Squal restoration sites; upstream of COB planned restoration at Filippih; in Tier 1, subwatershed, in priority restoration polygon.	\$ 1,000,000	Completed repair of pool in 2016. Full fish passage requires partial design COB/Port.	14.2
4	01.0622.0.80	-48.72	-122.5	Padden 7	Padden Cr	16th St	11.942	11.942	WS drop	67	CH, ST	downstream of WSDOT 2014 bridge, WSDOT prioritized project 2025	None	downstream of COB 2015 Padden Daylighting, COB Lehigh St repair 2016, WSDOT 2014 SR 11, Tier 1	\$ 1,000,000		14.0
5	991104	-48.76	-122.51	Squalicum 2	Squalicum Cr	Roulet Ave	38933	unknown	tees	unknown	CH, ST, BT	downstream of private McLeod 2007, COB Willow Spring 2010/2018, COB Squal Ph 1/2 2015, COB McLeod 2015, WSDOT prioritized 2025, COB Squal Ph 3/4 2020.	None	downstream of COB Willow Spring 2010/2018, COB Squal Ph 1/2 2015, COB Squal Ph 3/4 2020.	\$ 4,000,000	2016. Full fish passage requires permits.	14.0
6	01.0622.0.70	-48.72	-122.5	Padden 6	Padden Cr	14th St	48.14	3701	depth	67	CH, ST	downstream of COB Lehigh St repair 2016, WSDOT 2014 bridge, WSDOT prioritized project 2025	None	downstream of COB 2015 Padden Daylighting, Tier 1 subwatershed, in priority restoration polygon.	\$ 200,000		13.5
7	991600	-48.7	-122.46	N/A	Padden Cr	Lake Padden	30.88	3533	WS drop	0	ST	upstream of COB James St repair 2016, WSDOT 2014 bridge (USDOT 2, WSDOT) prioritized project 2025 (4, 2501)	none	upstream of COB 2015 Padden Daylighting, Tier 1 subwatershed, in priority restoration polygon.	\$ 500,000	in vicinity of Lake Padden	13.5
8	993884	-48.79	-122.47	Tetragraph Detention	NF Baker Cr	Tetragraph Rd	unknown	1830	other	33	ST, BT	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites	ES-037 Tetragraph Rd project, 2021, and is priority restoration polygon	upstream of lower Squal restoration sites, COB Willow Spring 2010/2018, in Tier 1, subwatershed and is priority restoration polygon	\$ 1,000,000	Electrum flood dam, fish passability from ESA 2019	13.3
9	01.0552.2.00	-48.78	-122.49	N/A	Squalicum Cr	Meridian St	unknown	17381	WS drop	67	CH, ST, BT	downstream of COB Squal Ph 1/2 2015, COB Squal Ph 3/4 2020, upstream of COB lower Squal restoration sites	None	upstream of COB Willow Spring 2010/2018 and COB/NSA lower Squalicum restoration;	\$ 1,000,000		13.2
11	99284	-48.8	-122.48	Spring 4	Spring Cr	Kellogg Rd	21.03	6516	unknown	unknown	ST, BT	Squal fish barrier improvements near Squal Cr Park	None	upstream of COB Spring Cr restoration site, lower Squal restoration sites, COB Willow Spring	\$ 1,000,000	upstream of iron gate flood dam	12.8
10	993981	-48.79	-122.48	Spring 2	Spring Cr	E Bakerview Rd	25.43	7318	velocity	67	ST, BT	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites	None	upstream of Spring Creek restoration site 2004, upstream of lower Squal restoration sites, COB Willow Spring	\$ 1,000,000	immediately upstream to Filippih donation	12.7
13	993982	-48.79	-122.46	N/A	Baker Cr	Tetragraph Rd	unknown	5786	slope	0	ST	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	\$ 500,000		12.5
12	01.0559.0.10	-48.78	-122.49	N/A	W. Squalicum Cr	Meridian St	unknown	0	WS drop	67	CH, ST, BT	upstream of COB lower Squal fish barrier improvements near Squal Cr Park	ES-0513 upper portion of Squalicum downstream of Squalicum Re-estate Phases 1 and 2 2015 because isolated fish habitat as part of roundabout study.	upstream of COB Willow Spring 2010/2018 and COB/NSA lower Squalicum restoration sites; upstream of COB Baker Cr, COB Willow Spring 2010/2018, COB lower Squal restoration sites; COB Lehigh St repair 2016, WSDOT 2014 SR 11, in Padden Daylighting.	\$ 500,000	Neigam based on WDW report, fish passability from ESA 2019	11.8
16	993880	-48.78	-122.48	SF Baker 1	SF Baker Cr	E McLeod Rd	15.48	1984	unknown	unknown	ST, BT	upstream of private McLeod 2007, COB McLeod 2015, WSDOT prioritized 2025, COB Willow Spring 2010/2018, COB lower Squal restoration sites	none	upstream of COB Baker Cr, COB Willow Spring 2010/2018, COB lower Squal restoration sites; COB Lehigh St repair 2016, WSDOT 2014 SR 11, in Padden Daylighting.	\$ 500,000		11.7
17	99470	-48.71	-122.48	Padden 11	Padden Cr	30th St	18.03	5317	slope	33	ST	upstream of WSDOT prioritized 2025, upstream of WSDOT 2014 Padden Daylighting.	none	upstream of COB 2015 Padden Daylighting 2015, COB Lehigh St repair 2016, WSDOT 2014 SR 11, in Tier 1 subwatershed, in priority restoration polygon.	\$ 3,000,000		11.3
14	991559	-48.71	-122.47	Padden 13	Padden Cr	31th 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 Lehigh St repair 2016, WSDOT 2014 SR 11, in Tier 1 subwatershed, in priority restoration polygon.	\$ 1,500,000		11.0
15	993883	-48.79	-122.48	NF Baker 2	Baker Cr	Deemer Rd	unknown	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	11.0
18	993993	-48.79	-122.45	Havenham Detention	SF Baker Cr	Stiefel Cr	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	COB Baker Cr restoration site, lower Squal restoration sites	\$ 1,000,000	Iron gate flood dam, fish passability from ESA 2019	9.8
19	993040	-48.79	-122.45	Baker 9	Baker Cr	E Bakerview Rd @ Irongate	23.04	5014	depth	33	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, lower Squal restoration sites, COB Willow Spring 2010/2018, upstream of Filippih 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 is priority restoration polygon.	\$ 1,000,000	no juveniles present because upstream of total barrier	9.5
20	370678	-48.75	-122.46	Lincoln 5	Lincoln Cr	Lincoln St	unknown	2440	slope	33	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB lower Squal restoration sites	none	upstream of COB 2006 Red Tail Beach, COB Whatcom Creek Estuary	\$ 1,000,000	downstream of Fred Meyer tunnel.	9.0
21	993443	-48.8	-122.41	Baker 12	Baker Cr	Hannegan Rd	18.28	3457	velocity	67	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration sites, lower Squal restoration sites	proposed secondary internal	upstream of COB Willow Spring 2010/2018, COB Willow Spring 2010/2018, COB restoration at Baker Cr, in Tier 1 subwatershed	\$ 1,000,000	upstream of iron gate flood dam, fish passability from ESA 2019	8.5
22	993821	-48.8	-122.41	Baker 13	Baker Cr	Hannegan Rd	22.6	2993	slope	33	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration sites, lower Squal restoration sites	none	upstream of COB Willow Spring 2010/2018, COB lower Squal restoration sites, COB planned restoration at Filippih, COB restoration at Baker Cr, in Tier 1 subwatershed	\$ 1,000,000	upstream of iron gate flood dam, COB and other culverts, no juveniles present because upstream of total barrier	8.3
23	370684	-48.76	-122.45	N/A	Whatcom Cr	Woburn St	unknown	500	slope	0	CH, ST, BT	downstream of Boulder Bend and Whatcom Falls Park 1999 restoration; upstream of COB Red Tail Beach, COB Salmon Park, COB Cemetery Cr, COB Whatcom Creek Estuary, planned W Cemetery Cr WQ improvements	None	downstream of Boulder Bend and Whatcom Falls Park 1999 restoration; upstream of COB Red Tail Beach, COB Salmon Park, COB Cemetery Cr, COB Whatcom Creek Estuary, planned W Cemetery Cr WQ improvements	\$ 7,000,000	AKA WDPW, con firm OK, fish passability	8.2
24	370683	-48.74	-122.41	W Cemetery 3	W Cemetery Cr	Oli Lakeview Dr	unknown	2100	WS drop	0	ST	ES-047 2019 TID project, creating a 30-foot wide two-way drop structure at Lakeview/Oli	proposed secondary internal	upstream of COB 2006 Red Tail Beach, COB WQ improvements	\$ 500,000	no juveniles present because upstream of total barrier	8.0
25	370648	-48.74	-122.41	W Cemetery 4	Cemetery Cr	Lopez St	unknown	1110	slope	0	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration sites, lower Squal restoration sites	none	upstream of COB 2006 Red Tail Beach, COB Whatcom Creek Estuary	\$ 500,000		8.0
26	370658	-48.75	-122.45	W Cemetery 2	W Cemetery Cr	Lakeview Dr	unknown	2260	slope	0	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration sites, lower Squal restoration sites	none	upstream of COB 2006 Red Tail Beach, COB Whatcom Creek Estuary	\$ 5,000,000	RW Ops concerned about impacts of total due to culvert failure	8.0
27	993482	-48.71	-122.48	Hogge 4	Hogge Cr	25th St	1778	263	slope	33	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration sites, lower Squal restoration sites	None	in Tier 1, subwatershed, in priority restoration polygon	\$ 500,000	no juveniles present because upstream of total barrier	7.0
28	993484	-48.71	-122.48	Hogge 5	Hogge Cr		16.9	263	slope	0	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration sites, lower Squal restoration sites	None	in Tier 1, subwatershed, in priority restoration polygon	\$ 75,000	no juveniles present because upstream of total barrier	7.0
29	993483	-48.71	-122.49	Hogge 3	Hogge Cr	Weturban Trail	17.81	283	slope	33	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration sites, lower Squal restoration sites	None	in Tier 1, subwatershed, in priority restoration polygon	\$ 250,000	no juveniles present because upstream of total barrier	7.0
30	1280163	-48.8	-129.5	N/A	E Baker Cr	Horton Flood Dam	unknown	810	velocity	67	ST	1.5 m upstream of City Mitigation Bank site (Baker Cr), 1.5 m upstream of Whatcom County planned improvement for barrier 1280204	None	1.5 m upstream of City Mitigation Bank site (Baker Cr), 1.5 m upstream of Whatcom County planned improvement for barrier 1280204	\$ 1,000,000	no juveniles present because upstream of total barrier.	6.8
31	370649	-48.73	-122.45	W Cemetery 5	Cemetery Cr	San Juan Blvd	unknown	0	slope	0	ST	upstream of COB 2006 Red Tail Beach, COB Whatcom Creek Estuary Cr	none	upstream of COB 2006 Red Tail Beach, COB Whatcom Creek Estuary Cr	\$ 500,000	no juveniles present because upstream of total barrier	6.0
32	370679	-48.75	-122.45	Magnolia 1	E Cemetery Cr	Woburn St	unknown	0	WS drop	0	ST	upstream of WSDOT prioritized 2025, COB McLeod 2015, COB Baker Cr restoration sites, lower Squal restoration sites	none	upstream of COB 2006 Red Tail Beach, COB Whatcom Creek Estuary	\$ 5,000,000	upstream of iron gate barrier	5.0
TOTAL																	
*ESA species benefiting (as documented on WDW fish barrier field form, CH = Chinook, ST = steelhead, BT = bull trout)																	