

Skagit Basin Barrier Culvert Analysis: Public and Private Stream Crossings

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INTRODUCTION

OVERVIEW

Barriers that prevent access to existing aquatic habitat have been identified as one of the most significant limitations to salmonid productivity in the Pacific Northwest (Shear and Steel 2006). Transportation corridors, agriculture, urbanization and other human land-use practices have diminished the availability of spawning and rearing habitats for all cold-water dependent species native to the region (Montgomery 2005, Bilby and Molloy 2007, Hall et al. 2018). A major feature of these land uses is the presence of culverts and other structures that facilitate road crossings of streams and wetlands. While these structures are often adequate to allow water to move through the road crossing, they can impede the passage of anadromous and resident salmonids by creating conditions that exceed the swimming abilities of adult or juvenile fish.

In the Skagit River Basin, efforts have been made by various organizations over the years to inventory and assess crossings for barrier status, but available datasets are aging, which has made restoration planning difficult. This project represents an attempt to address these problems by consolidating and updating available data while documenting new barriers and the habitat they isolate. Due to their prevalence, we have chosen to begin this work by focusing on culvert crossings, reserving other barrier structures for future efforts. We have worked to create a current database that captures the known universe of culvert barriers on as many public and private road crossings as possible within the Skagit River basin. Our hope is that the database and the analyses presented here will support informed allocation of limited resources towards efforts to restore habitat access for anadromous salmonids.

This document begins with an overview of our process and rationale for narrowing the geographic scope that we used to derive our list of barrier culverts. This is followed by a description of our process for reconciling and updating available data, along with methods for barrier and habitat assessment. While we leave the task of prioritizing individual culvert projects to the governments, agencies, landowners, and organizations considering undertaking barrier correction efforts, we have broken out our summary of results in ways that we feel will be useful for assisting such decisions (Appendix A). We also present, in the form of two appendices, subsets of our full culvert database that are limited to areas relevant to Salmon Recovery Funding Board (Appendix B) and Puget Sound Energy (Appendix C) funding sources.

BACKGROUND

Culvert crossings, by a large margin, make up the greatest proportion of artificial (human-made) fish passage barriers in Washington State (WDFW 2019). Small dams, diversions, and similar structures, while not as widespread as culverts, also have similar negative impacts. Many of these barriers completely block passage for all fish at a wide range of flows, while some are partial barriers that block passage only for certain species or life stages, or during certain flow conditions.

There have been numerous efforts to inventory fish passage barriers throughout the Skagit River basin over many years, with the most comprehensive effort taking place from 1995 through 2001 as a combined effort between the Washington Department of Fish and Wildlife (WDFW) and the Skagit System Cooperative (SSC). The effort stemmed from work to complete an off-channel habitat inventory, during the course of which it became apparent that many barriers had not been mapped or assessed. The unique-for-the-time State/Tribal collaborative effort resulted in the first relatively comprehensive

database of barrier culverts for the basin; it has been the primary source of barrier culvert information for the past two decades.

While the WDFW/SSC database remains an important resource, the GPS mapping technology available at the time made it challenging to accurately map culvert locations. Although the project team made the best possible effort given available resources, GPS units practical for field use in the late 1990's often had poor accuracy, particularly in forested terrain. Similarly, high-resolution digital aerial imagery and topographic data that are common today were not readily available during the time period when that project was underway. As a result, many culvert locations could not be accurately mapped. Furthermore, as time has passed, updated assessment methodologies, changes to culvert and stream conditions, limited habitat data, and inconsistent data collection methods and formats from additional organizations conducting assessments have reduced the utility of the database over time for restoration planning.

In the Skagit River Basin, culverts represent more than 70% of known fish passage barriers (WDFW 2019). For many of these culverts, barrier status has not been assessed in more than 20 years, so changes to culvert condition over time has not been documented, and no assessment has been completed for many culverts installed after those surveys. Similarly, many repairs to culverts, whether for fish passage improvements or for other purposes, have gone undocumented. Finally, there is not currently an easily available way for restoration planners to consider the benefits of a culvert project in the context of upstream or downstream barriers that may be present.

To address these deficiencies, a group of organizations including Skagit County, the Skagit River System Cooperative (SRSC), the Skagit Fisheries Enhancement Group (SFEG), and the Upper Skagit Indian Tribe (USIT) have worked collaboratively to update our understanding of legacy culvert barriers within both public and private ownership. While recognizing that other barrier types exist and should be assessed in similar fashion, we have focused here on culvert crossings due to their overwhelming prevalence in the watershed. We intend this report as a means to share data and analyses with local and tribal governments, conservation groups, private landowners, and others that have an interest in salmon habitat restoration. It is hoped that work on this project will be ongoing, resulting in a single database of fish passage barriers for the Skagit River Basin to support prioritization and restoration planning efforts.

PROJECT APPROACH AND SUMMARY OF METHODS

Our project team began this effort in 2015, first working to improve the spatial accuracy of previous data sets and increase compatibility of existing data formats. Next, we focused on collecting new information and updating older fish passage barrier assessments on public- and privately-owned culverts previously identified as barriers. For this, we used methods and database formats consistent with Washington Department of Fish and Wildlife (WDFW) protocols (WDFW 2009) because they are widely used by regulatory agencies, funders, and project proponents. Next, we updated GIS habitat estimates and collected field-based habitat data where possible. Finally, we compared barrier culverts to information about fish usage to determine anticipated species benefits, particularly for ESA-listed Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead trout (*O. mykiss*). While the purpose of this report is not to prioritize individual culvert projects, we have summarized our findings in ways that are intended to be useful for governments, agencies, and other stakeholders who wish to make informed judgements about the relative benefits of a particular project. Work is ongoing, and the summaries presented here will be updated as new data are collected.

To identify a list of culverts for updated barrier assessments, we began by defining our project study area. We started with the WRIA 03/04 boundary, which includes the Skagit Basin and the Samish River watershed. We then filtered out the Samish watershed, the Skagit estuary, Fidalgo Island, and the Skagit watershed upstream of the Gorge Dam at Newhalem. Within our narrowed study area, we selected anadromous barrier culverts on public and private roads that had first been identified through older assessment efforts, reports, and data (SSC 2001, WDFW 2016). Some culverts not initially identified were added based on new information from WDFW (2016) or from project partners with knowledge of potential new barrier culverts. This refined list served as our basis from which to begin completing new fish passage barrier assessments using current WDFW methods (2009).

For culverts identified as fish passage barriers, work is underway to complete field-based habitat surveys upstream to determine how much habitat is blocked for use anadromous fish. For all field-based habitat surveys, we have followed WDFW (2009) protocols, which allow characterization of habitat availability on a species-by-species basis from a given stream crossing upstream to the end of naturally accessible habitat. These field-based surveys (as opposed to GIS-derived estimates) yield the best information but can be challenging to complete. In some cases, field surveys are not possible due to private property considerations. Where field habitat surveys have not yet been completed, GIS-based information was used as a surrogate indicator of habitat value. We also compiled counts, by ownership, of known upstream and downstream barriers from each given crossing.

These data allow barrier culverts to be sorted by potential habitat gain, by whether they are partial or complete barriers, by number of upstream and downstream barriers, by relative cost/level of effort to repair, or by other factors described in the following pages. The summaries presented here should allow governments, agencies, landowners, and other stakeholders to prioritize culvert crossings for additional scoping and, if warranted, preliminary design work.

Although our list includes culverts of all ownerships, for this effort we have elected to use available funding to focus on updating assessments for County (Skagit, Snohomish, and Whatcom) and privately-owned culverts, because these represent nearly three quarters of all barrier culverts in the Skagit Basin. Even though new surveys have not yet been completed for other ownership types, including municipalities (Mount Vernon, Burlington, Sedro-Woolley, Concrete, Lyman, and Hamilton) and other public ownership (Federal, State, Tribal, Drainage District, and Port), the old records are included in this report to present a clearer picture of the barriers present in the watershed. A great deal of work still remains to update survey records for these culvert crossings, and as part of the next phase of the project we intend to update the inventory for these other publicly-owned culverts.

METHODS

IDENTIFYING CULVERTS FOR SURVEY

From 1997 through 2001, the Skagit System Cooperative (now SRSC) completed a survey of nearly all known stream crossings within the anadromous portion of the Skagit River Basin (SSC 2001). Each stream crossing was evaluated for fish passage status using the WDFW methods that were current at that time (WDFW 2000), but no data were collected on habitat conditions upstream of the crossings. Our current project used the SSC 2001 data as the initial base layer from which to develop a list of culverts to begin evaluation.

The SSC 2001 dataset also formed the basis for the current WDFW road crossing database in the Skagit Basin, which has been updated and added to since 2001, and is publicly available on the WDFW website (WDFW 2019). Our dataset was compared with the WDFW database to check that barrier culverts surveyed post-2001 were included, and to ensure that no 2001-era barriers had been left off of the modern database (WDFW 2016) (Figure 1). We also added some culverts that were likely barriers but had not yet been assessed for barrier status, as well as a handful previously assessed as passable but now known to be impeding fish. Other culverts were added opportunistically as the project went on, usually while crews were out surveying a different culvert and noticed something new or missing from the other datasets. Finally, a small set of culverts that had been identified as passable in the SSC 2001 dataset but for which outfall drops had been noted were added to the list to allow us to assess whether they had become barriers in the 15+ years that have passed since they were surveyed.

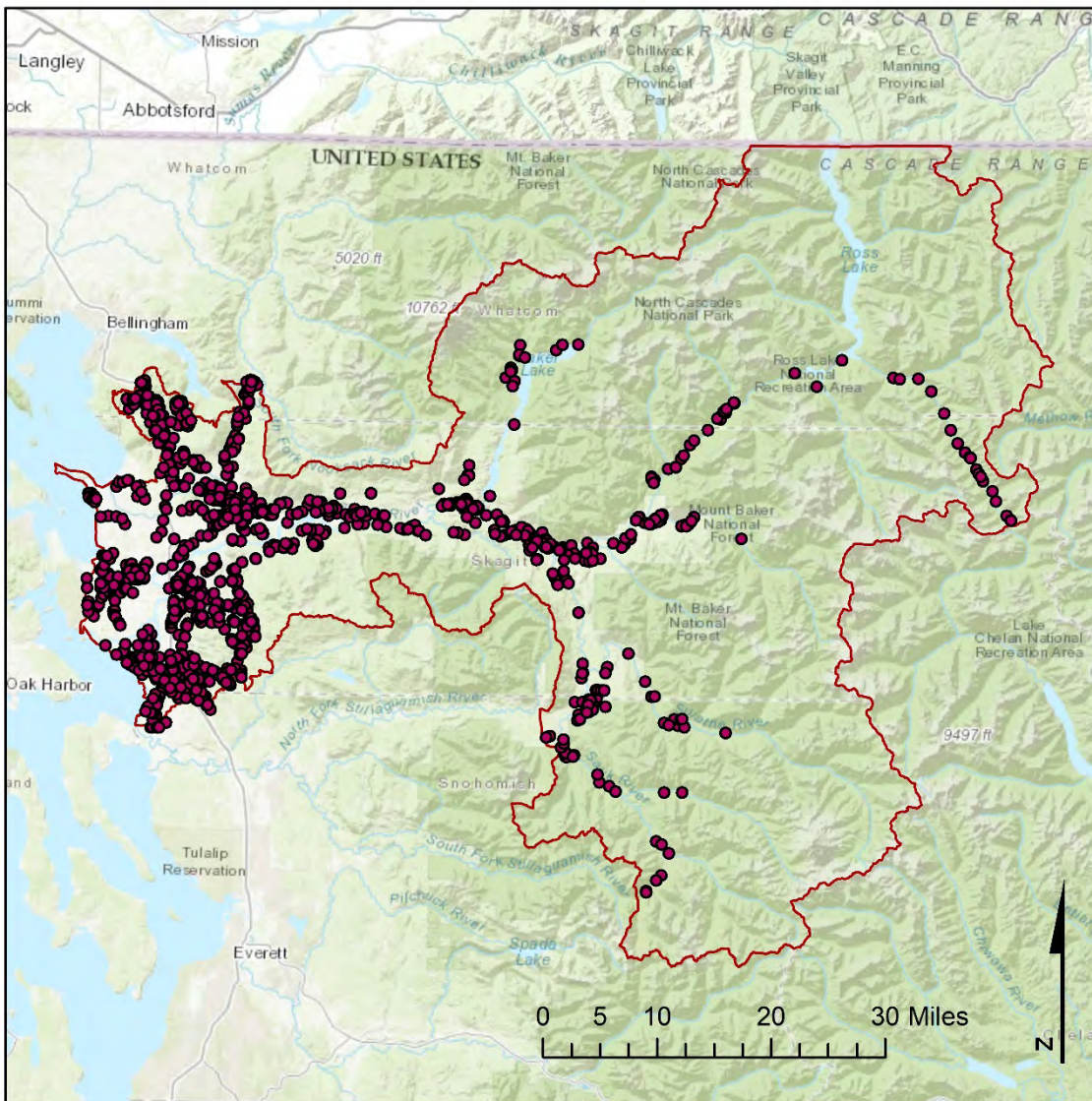


Figure 1. All known culverts (n=1,643) within the Skagit River Basin. The watershed boundary is shown in red. Background map source: ESRI USGSTopo service layer.

After developing our initial list, we narrowed the focus of our study by first selecting from our combined database of public- and privately-owned culvert barriers with presumed known or unknown anadromous fish use, setting aside culverts on streams known to support only resident fish use for separate analysis. For the purposes of this analysis, anadromous fish use was determined using a GIS layer SRSC developed to delineate the presumed upstream limits of anadromous fish use based on locations of known natural fish passage barriers and topography (Beamer et. al 2000). Barriers in the Samish River Watershed also were set aside to be evaluated independently from other Skagit County barriers, because project funding in the Samish is currently very limited; these should be evaluated as part of future efforts.

Similarly, we also set aside known barriers within the Skagit River Estuary and Fidalgo Island, because although the tidegates present in these regions also include migration barriers, they are difficult to evaluate with existing WDFW methods and are already being separately considered in negotiated agreements and settlements (such as the Drainage and Fish Initiative (DFI), the Tidegate and Fish Initiative (TFI), and NOAA Biological Opinions). Removing these impediments to upstream migration certainly will be beneficial to native salmonids, but for this effort we have chosen to focus on culvert crossings. We likewise set aside barriers in the watershed upstream of Gorge Dam at Newhalem because it is assumed that fish passage issues will be addressed through the ongoing FERC Relicensing effort.

Culvert crossings thought by WDFW to have no fish use were also removed from the list and set aside for later analysis (WDFW 2018). We also updated sites where new information was available, and finally removed from the list barriers known to have been repaired to current WDFW Water Crossing Design standards (Barnard et al. 2013) since the development of the either WDFW or SRSC Data layers. These standards were used to evaluate fish passage status because they are widely used by regulatory agencies, funders, and project proponents. We recognize that there may be concerns about the adequacy of these standards in ensuring passage for all species and life history stages and for developing designs that will continue to be effective under projected climate change scenarios, but an evaluation of design standards is outside the scope of this project.

Once we had developed our refined list of barrier culverts (Figure 2), we linked GIS-derived habitat data from a database developed by Smith and Waldo (2003) to allow sorting of culverts by upstream habitat area. The Smith and Waldo 2003 dataset includes habitat area estimates that were weighted by assumed habitat quality values (based on relationships between stream gradient and associated land use). Methods for GIS habitat estimates are described in greater detail below.

This list represents our best effort to identify Skagit Basin barrier culverts for more detailed assessment. Our list is based upon a range of available information, and we merged and integrated existing datasets in order to present as complete of an overview as possible. However, it is likely that previously unmapped barrier culverts will be discovered as assessment efforts continue, in which case they will be mapped, added to our database, and put on a list for survey. Additionally, stream crossing locations in Skagit County's current culvert database are tracked by road miles and therefore not easily comparable to other datasets; the County is shifting towards a GIS-based asset management tool, at which time supplementary County data can be more easily integrated into the project database.

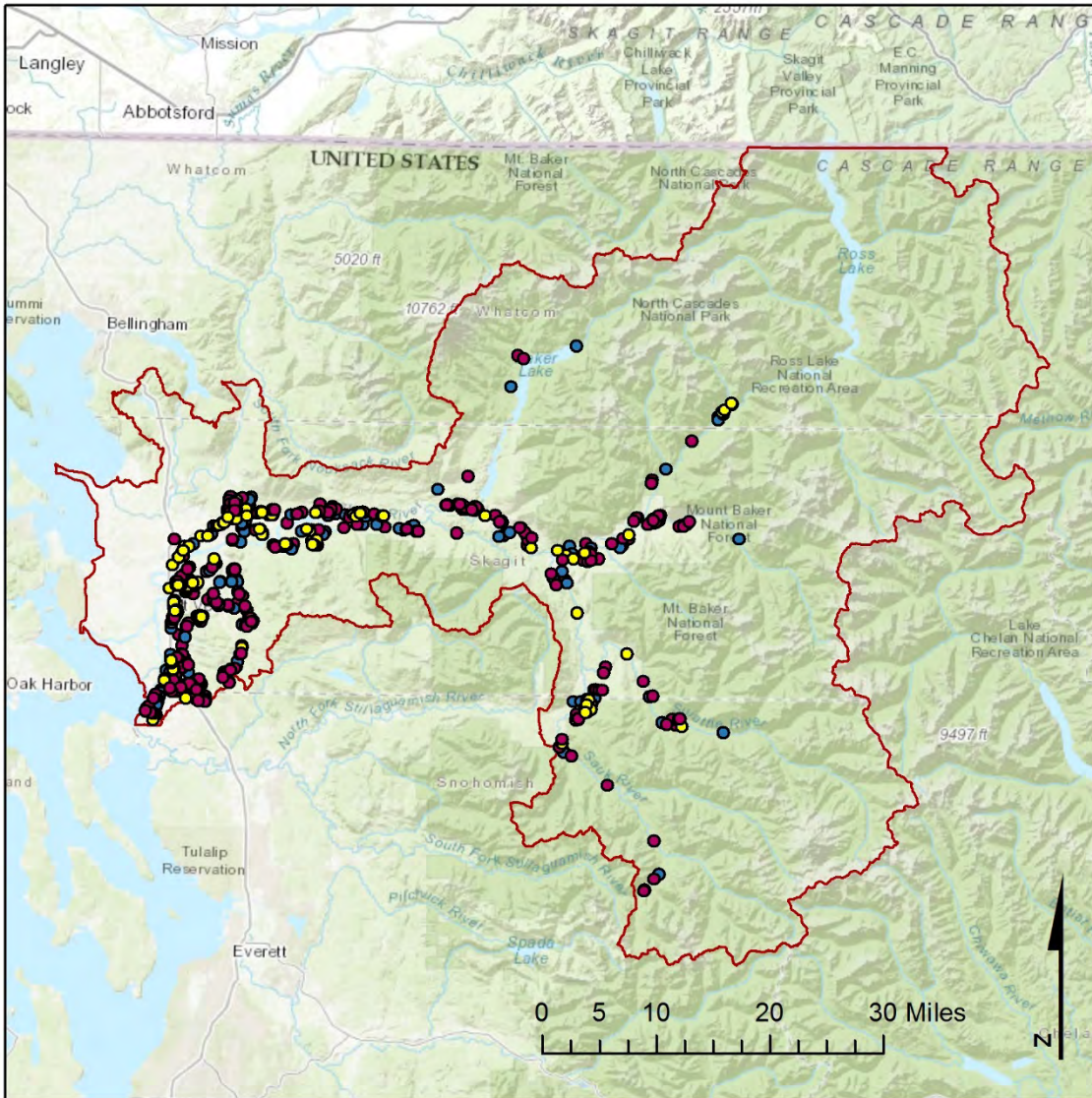


Figure 2. Study area culverts (n=692) by barrier status. Passable (blue): 249, Unknown (yellow): 91, Barrier (red): 352. Barrier statuses shown here include the results of our study. Background map source: ESRI USGSTopo service layer.

NEW BARRIER ASSESSMENTS FOR SELECTED CULVERTS

WDFW Barrier Assessment Methods

Our field crews worked towards completing new barrier assessments for our entire culvert list, beginning with County and privately-owned culverts. We followed methods from the Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual (WDFW 2009) current at the time of the barrier assessments performed for this report. An updated manual has since been published by WDFW (2019), but it is our understanding that the 2019 manual is largely a refinement of the 2009 methodologies, offering clearer guidance and methodologies for sites where obtaining measurements or making barrier judgements is not straightforward. We believe that the barrier determinations made under the 2009 manual used for this report would be the same as would

be made using the new manual, and we have looked to the 2019 update to assist with making determinations for culverts where a barrier call was not possible under the 2009 manual.

The WDFW methods call for surveyors to first collect baseline (Level A) information about culvert material, shape, and dimensions, along with installation details like culvert slope, bed material, hydraulic drop, and channel characteristics such as backwater status, channel width, and plunge pool depth. These data allow crews to determine in the field whether a culvert is A) passable, B) a fish passage barrier due to slope or water surface drop, or C) whether a more detailed (Level B) assessment is required to make a barrier determination. The Level B assessment, if needed to determine barrier status, involves collection of channel substrate, cross section, hydraulic control, water depth, and slope data, along with more detailed information about culvert slope and roughness. The Level B data are input into hydraulic analysis software in the office to determine whether a culvert is a barrier due to velocity or depth. In some cases, such as at culverts located on slough habitat, Level B analysis cannot be completed using existing WDFW methods. Despite their “unknown” barrier status, many of these culverts may be impairing natural processes or blocking high-value habitat, so we have listed these separately in our Results section. Further consideration may be warranted for some of these sites.

While almost all of the culverts on our list were previously surveyed between 1997 and 2001, conditions at a given culvert crossing, including culvert deterioration, channel migration, sediment deposition, and others, may have been altered during the years since the first survey (such changes also highlight the need for ongoing barrier assessment). Additionally, there have been changes from the 1998 WDFW manual used for the older surveys to the 2009 manual (Table 1). These changes, which include the types of data collected along with changes to the flow chart used to determine barrier status, have resulted in a greater number of culvert crossings requiring Level B analysis.

Table 1. Differences between the 2000 and 2009 WDFW Barrier Assessment Manual Level A Flow Charts.

Category	2000	2009	Note
<i>Bed material</i>	Is there natural streambed material throughout the culvert?	Is the culvert at least 20% countersunk?	A culvert is considered countersunk if the downstream end is embedded into the channel bed by at least 20% of the culvert diameter or rise, and bed material is present throughout the culvert (WDFW 2009)
<i>Backwater</i>	Backwater status not considered	Is the culvert backwatered?	A backwatered condition within a culvert is present if a pool with little or no current exists through the entire length of the culvert (WDFW 2009).
<i>Outfall Drop</i>	Water Surface Drop \geq 0.24 Meters is second step of flow chart, after bed material.	Water Surface Drop \geq 0.24 Meters is first step of flow chart, before countersunk and backwater status.	

Supplemental Information

In addition to collecting data required for barrier assessments, crews collected supplemental data useful for restoration project planning. These included photos of the channel, culvert, and roadway, information about road composition and fill, notes about utilities observed at the site, and notes about impacts to transportation should road closure be required for repair. Crews also improved mapped culvert locations by using mapping-grade GPS to record locations for all new surveys, as well as for a subset of culverts for which the previously mapped location was inaccurate.

Challenges to Barrier Assessment

Site access for County-owned culverts was generally straightforward, as they are located within public rights-of-way. However, gaining permission to access privately-owned culverts was sometimes more difficult or was not possible, so we have had to rely on older data for more than 75% of these sites. Our crews initiated contact using mailers, which were followed up by phone calls or in-person visits. Many landowners had no problem with granting access to our survey crews, but others were either unwilling or were unreachable. For these sites, our crews took notes about reasons why a survey was not able to be completed, and these were recorded in our database. If no new survey could be completed, the previous barrier assessment was substituted. Sites for which access was not possible will be revisited at a future date.

HABITAT ASSESSMENTS

GIS Methods for Habitat Assessment

Most culverts on our list had associated GIS-derived habitat measurements, as computed by Smith and Waldo (2003). For that project, each culvert crossing was assigned a weighted habitat area, representing habitat area in square meters, from the crossing upstream to the next natural or artificial barrier, or to the upstream end of usable stream habitat (whichever came first). Culverts were sorted by weighted area, and barrier crossings with high estimated habitat value were prioritized for conducting ground-based survey.

For culverts that were not present within the SSC 2001 dataset, no Smith and Waldo 2003 area estimates were available. To allow comparison of upstream habitat area for these sites, we used methods similar to those identified in Smith and Waldo (2003). First, Skagit County hydrography, elevation, and hillshade datasets were used to measure channel length, slope, and width of wetted habitat from each barrier culvert upstream to the next natural or artificial (human-made) barrier. We then used ortho photos to determine land-use categories along the reaches. To create an estimate of potential usable habitat area, the measured area was weighted by the land use and stream gradient based on the table provide in Smith and Waldo (2003) (Table 2). As with the barrier assessments, we focused first on County and private culverts, so new weighted habitat areas have not yet been calculated for many Federal, State, and City crossings. Future work to complete estimates for all crossings as well as to improve the accuracy of GIS-derived habitat estimates is recommended.

Table 2. Weighting system used for habitat area for different habitat and land use classifications (Smith and Waldo 2003)

Habitat Type	Gradient	Weighted Multiplier	
Pool:riffle, sloughs, lakes, ponds, wetlands	< 1%	1.00	
Forced pool:riffle, plane bed	1-4%	Agricultural/Urban	0.50
		Rural	0.70
		Forestry	0.85
		National Forest/Parks/Wilderness	1.00
		Unknown	1.00
Step pool	4-8%	0.50	
Steep	> 8%	0.00	

Field-Based Habitat Assessments for Selected Culverts

For many sites that were determined to be barriers, field-based habitat surveys were conducted to determine how much habitat upstream of a barrier would be made available if it were repaired, following methods laid out in the Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual (WDFW 2009). These surveys involve a physical habitat survey from the crossing upstream to the end of anadromous fish use, an inventory of all human-made features, and finally a prioritization using the WDFW Priority Index. For the physical habitat surveys, streams are broken into reaches with similar gradient, bed form, and channel size, or at ponds or human-made fish barriers. Culvert crossings with high weighted habitat areas (Smith and Waldo 2003) were prioritized for physical surveys, though access constraints were also considered; some streams with high weighted areas were very long and crossed numerous parcels, which complicated access.

Our crews used the “Reduced Sampling Full Survey” method outlined in the WDFW manual, with one sample section per reach. Within each reach, one representative 60-meter sample was surveyed, documenting A) the length of pools, riffles, and rapids, B) wetted and scour line widths for the first two pools, riffles, and rapids, with average depth recorded at each width measurement, C) visual estimates of substrate composition, and D) gradient at each sample section. Additionally, the influence of springs on stream flow, water temperature, percent shading, and instream cover density was measured or estimated. Quality of spawning and rearing habitat was rated, and visual estimates of juvenile abundance were recorded.

These data, coupled with measurements of watershed area, were used to calculate a Priority Index (PI) that allows comparison of and ranking of similar projects in different watersheds (WDFW 2009). This index is intended to “consolidate several factors that affect a fish passage project’s feasibility (expected passage improvement, production potential of the blocked stream, fish stock health, etc.)...” (WDFW 2009).

A number of habitat surveys were not completed due to access being denied by landowners (in the case of private culverts or habitat surveys that cross multiple surveys). High flows or other conditions that made survey difficult or hazardous also prevented crews from completing surveys. For these sites, our crews recorded detailed notes about why an assessment was unable to be completed. In some cases,

sites were able to be revisited under different flow conditions, but surveys could often not be completed for properties where landowners denied access.

Comparability of Physical Habitat Surveys to GIS-Derived Habitat Data

Differences in data availability and methodologies between physical habitat surveys and GIS-derived measures mean that the outputs are not directly comparable. The GIS-based methods developed by Smith and Waldo (2003) produce a habitat area, weighted by land-use and gradient, from a crossing *upstream to the next barrier crossing or natural barrier* with no differentiation between spawning and rearing habitat. The physical surveys produce separate (and potentially overlapping) spawning and rearing habitat areas, along with overall lineal gain, from a crossing upstream to the end of accessible anadromous habitat *regardless of whether upstream barrier crossings are present*. Additionally, the physical surveys can be used to derive a Priority Index (as noted previously), which incorporates both species benefits and potential restoration cost. A Priority Index value is often required for grant funding applications.

While ideally the GIS-derived results would be analogs of physical surveys, completing new GIS analysis for all culvert crossings is more effort than was possible to complete with existing funding. For this reason, we chose to use the existing Smith and Waldo 2003 data and methods despite its incompatibility with field surveys. We present both datasets here separately, and restoration planners should take both into account in considering which barrier culverts to prioritize for replacement. Development of a GIS layer that is analogous to field assessments would be very beneficial for ongoing work and additional funding should be pursued for such a project.

UPSTREAM AND DOWNSTREAM BARRIER CONTEXT

It is important that restoration planners considering barrier correction projects take into account other barriers that might be present upstream or downstream of a given barrier. Barriers downstream from a site may prevent the fish passage benefits from a barrier correction project from being realized. Similarly, the presence of upstream barriers can reduce the habitat gains that might be achieved by a project. There was not an easy way to quickly assess barrier projects in context of other barriers on the same system, so we developed a methodology and data layer for this purpose. Our system is a similar concept to the hierarchical stream network order developed by Strahler (1952). Although we have considered only culvert crossings for the bulk of our project, for this analysis we took into account all barrier types and ownerships within our defined study area.

To begin, we first grouped all barriers on a particular stream system (defined as any tributary to the Skagit, Sauk, or Suiattle River along with all associated upstream bifurcations) into groups we called Barrier Clusters. Each Barrier Cluster was given a unique name, and included all barriers associated with an individual stream system. We then assigned, for each Barrier Cluster, a Barrier Order number denoting a particular barrier's position within the system. Moving upstream from an individual stream's confluence with one of the mainstem rivers, the first barrier encountered was given a Barrier Order of '1'. The next barrier upstream of this was coded as Barrier Order '2', then '3', '4', and so on until all barriers on the system had been accounted for. For streams with multiple bifurcations, it is possible for a single system to have multiple crossings with the same Barrier Order (if the barriers are located on different tributaries to the same stream) (Figure 3). For streams with only one barrier, the crossing was coded as Barrier Order '0', indicating no known upstream barriers are present. All barrier crossings

upstream of natural fish passage barriers (such as waterfalls or steep gradient reaches) were coded as Barrier Order '-999.'

Barrier order is an indicator of the number of downstream barrier crossings (equal to barrier order minus one), so we also created a separate count showing the number of upstream barriers. Ideally, a sum of total habitat area upstream of a given barrier would also be computed, but we have not yet been able to do this because of the limitations of the available GIS layers discussed previously.

DATA MANAGEMENT AND ANALYSIS

All barrier survey data were checked for errors in the office then scanned for digital storage on an SRSC server along with accompanying photos or other information. Hard copies of all survey data sheets were retained. After scanning, data and barrier status updates were entered into a Microsoft SQL Server database and additional error checks were performed. Site photos were uploaded to an online archive, which could be linked to from our database. Level B data were entered and analyzed using Hy-8 (USFHA 2016) software. Copies of datasheets for completed surveys were submitted to WDFW for incorporation into their statewide culvert inventory geodatabase.

Habitat survey data were checked for errors and entered into Microsoft Excel spreadsheets provided by WDFW. These spreadsheets automate the computation of species-specific habitat values that can be used to calculate Priority Index (PI) values. Each tributary to a given stream was entered on its own data sheet, and the combined habitat values were then entered into a separate spreadsheet for calculating a PI value for the culvert crossing.

BARRIERS UNDER OTHER PUBLIC OWNERSHIP

The existing barrier inventories from SSC (2001) and WDFW (2018) include fish passage evaluations for many culverts owned by municipalities (Mount Vernon, Burlington, Sedro-Woolley, Concrete, Lyman, and Hamilton) or other public owners (Federal, State, Tribal, Drainage District, and Port). While occasionally barrier assessments for these culverts were completed opportunistically, as noted previously the project team did not focus on collecting new information for these culverts. We also did not systematically survey culverts in Snohomish or Whatcom County portions of the watershed. We instead queried the existing inventories to identify culverts within our study area that were identified as barriers or with an unknown barrier status. Some of these culvert barriers have GIS-derived habitat information and field-based habitat surveys, while others do not.

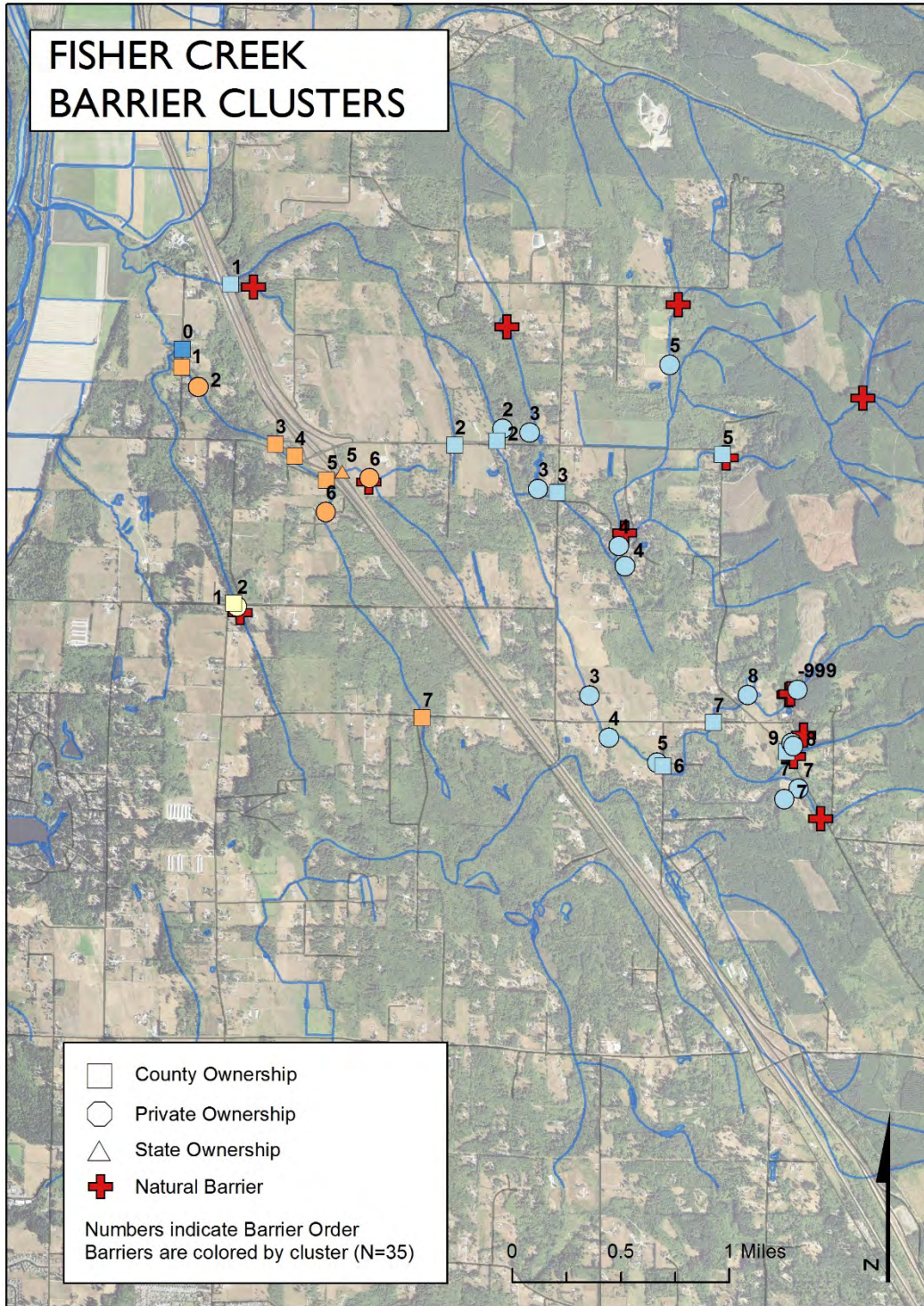


Figure 3. Barrier Cluster example showing the Fisher Creek drainage. All barriers shown here are on the same stream system, but can be grouped into four separate clusters because they are on different tributaries to the mainstem of Fisher Creek. Each barrier within an individual cluster is given a Culvert Order number depending on its position. One barrier on the cluster shown in light blue is located above a natural barrier, and was assigned a -999 barrier order. County, State, Private crossings are present in the system. Background imagery: 2019 Pictometry.

RESULTS

OVERVIEW

There are a total of 1,643 known culverts (all ownership types, barrier statuses, and without consideration of fish use) in the Skagit River Basin. This includes 1,072 under County or private ownership, and 571 are under other public ownership. Of these culverts, 443 are documented as barriers or unknown status and fall within our defined study area (Figure 4), of which 122 are County-owned, 204 are privately owned, and 117 are under other public ownership.

Collectively, our project team completed new barrier assessments for a total of 119 culverts, and when surveys by WDFW or other groups are included, barrier assessments for a total of 267 study area culverts have been completed since publication of the 2009 WDFW manual. No new assessments have yet been completed for the remaining 176 culverts, although work is ongoing.

We present barrier and habitat assessment results for the subset of 443 Skagit Basin barrier and unknown culverts within our study area as a series of independent tables, which should be considered as a group by land managers in prioritizing culverts for replacement. Detail about individual culverts beyond what is presented in this overview can be provided by request.

REVIEW OF STUDY AREA AND DATA SOURCES

Our study area includes the Skagit River Basin, but excludes the Samish River watershed, the Skagit Estuary, Fidalgo Island, and the portion of the Skagit Watershed upstream of the Gorge Dam at Newhalem due to complicating factors in those areas. We excluded passable culverts and sites outside the anadromous zone as defined in Beamer et. al (2000), as well as sites determined to have no fish use (WDFW 2018).

Barrier culvert data used to develop our original list for survey was from Skagit System Cooperative (2001) and Washington Department of Fish and Wildlife (2016) databases. GIS habitat estimates are from a layer developed by Smith and Waldo (2003). In the results presented here, we have included older data for sites where updated barrier and habitat assessments are not yet available.

Skagit Basin Barrier Culvert Analysis: Public and Private Stream Crossings

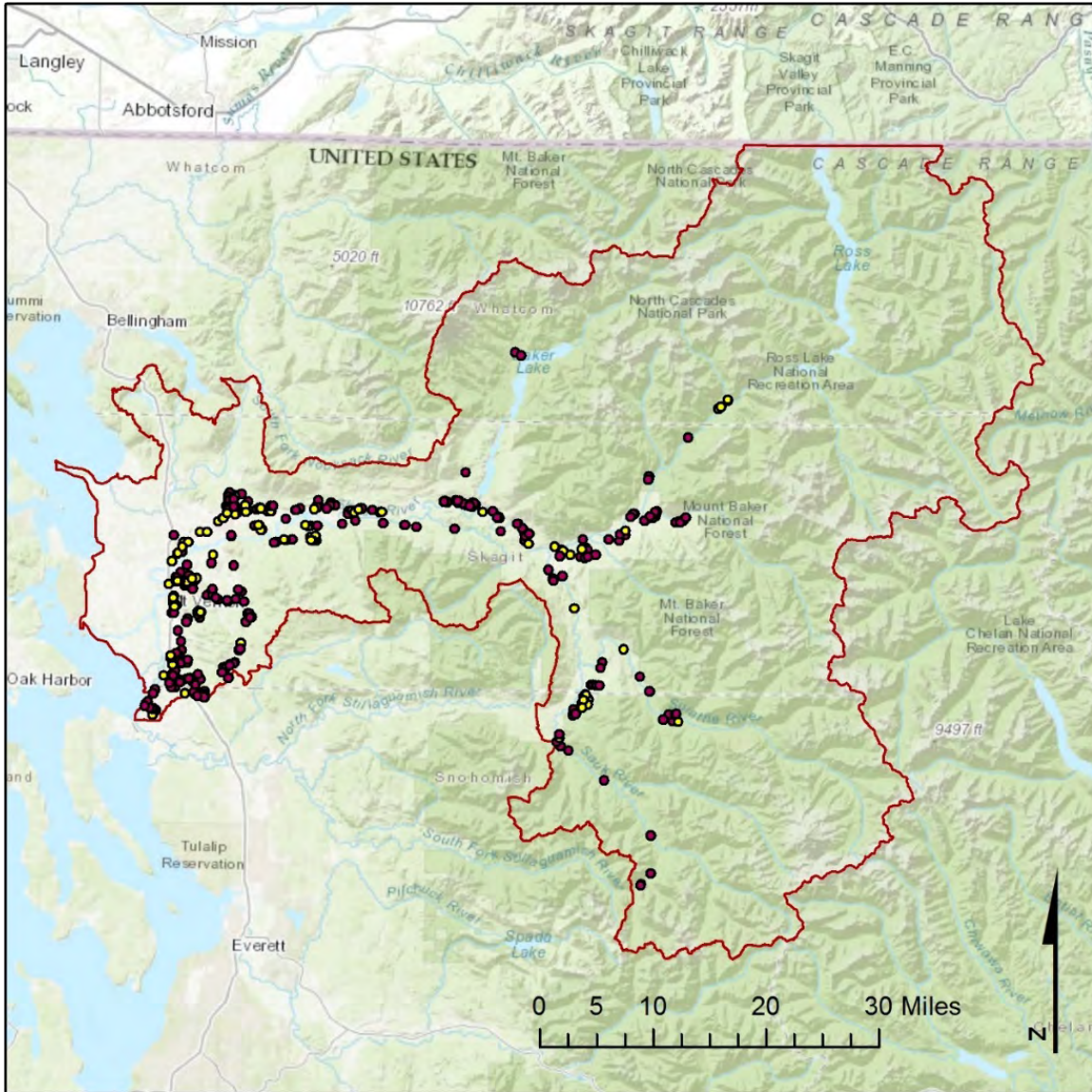


Figure 4. Barrier (red) and unknown-status (yellow) for known culverts in the study area. County: 122, Private: 204, Other Public: 117. The Skagit watershed boundary is shown in red. Background map source: ESRI USGS Topo service layer.

BARRIER CULVERTS BY OWNERSHIP

Of the 122 County-owned barrier and unknown culverts in our study area, 107 are barriers to upstream fish passage, while barrier status could not be determined for 15 sites¹. Of the known barriers, 92 are within Skagit County and 15 are within Snohomish County. 32 of these culverts are total barriers (0% passable), 36 culverts are 33% passable, and 27 culverts are 67% passable. Percent passability could not be computed for 12 culverts, although they are barriers, because they were from older data that did not have sufficient detail to determine passability. For the unknown-status culverts, barrier status could not be determined because they are either located in sloughs where current methodology does not apply, have access problems, or have other issues that prevented full survey and analysis. They are included here because they are likely barriers or because they have a great deal of upstream habitat and thus merit further consideration.

Of the 204 privately-owned barrier and unknown culverts in our study area, 167 are known to be barriers to upstream fish passage, while barrier status could not be determined for another 37 sites (for reasons described above)². Of the barriers, 149 are within Skagit County, and 18 are within Snohomish County. 33 of the culverts were total barriers, 48 culverts were 33% passable, and 42 culverts were 67% passable. Percent passability could not be computed for 44 culverts, although they are barriers.

Of the 117 barrier and unknown culverts under other public ownership in our study area, 78 were found to be barriers to upstream fish passage, while barrier status could not be determined for another 39 culverts³. Of the known barriers, 65 are within Skagit County, 8 are within Snohomish County, and 5 are within Whatcom County. 24 culverts are total barriers, 27 culverts are 33% passable, and 19 culverts are 67% passable. Percent passability could not be computed for 8 culverts, although they are barriers.

[See Appendix A, Tables 1-3]

¹ Barrier status for 25 culverts, mainly in Snohomish County, comes from pre-2009 survey data.

² Barrier status for 116 culverts comes from pre-2009 survey data.

³ Barrier status for 35 culverts comes from pre-2009 survey data

PASSABLE CROSSINGS

A total of 23 sites that had been considered barriers in the 2001-era surveys were found to be passable by the new surveys. This may be due to changes to the culvert, changes to stream characteristics, or a combination of both. Six additional culverts that were formerly barriers are known to have been removed or replaced by bridges since the older surveys.

[See Appendix A, Table 4]

SLOUGH HABITAT AND OTHER SITES THAT COULD NOT BE ASSESSED

A total of 5 culverts were not assessed for barrier status because they were situated on slough habitat that complicated hydraulic analysis, so WDFW methods do not apply. Future updates to WDFW assessment criteria may allow determination of passability. Although barrier status could not be determined for these culverts, some may block access to highly valuable habitat for juvenile salmonids and should be considered for further analysis or potential replacement.

An additional 86 sites could not be assigned a barrier status because they either 1) represent culverts surveyed under the 2001-era effort that had no barrier status (for unknown reasons) and have not been re-surveyed, or 2) had access problems or other issues that prevented barrier assessment.

[See Appendix A, Tables 5 and 6]

GIS-DERIVED UPSTREAM HABITAT ESTIMATES

Estimates of habitat area that could be made available upstream of each barrier culvert were taken from Smith and Waldo (2003) or were developed for the purpose of this analysis using similar methods, so this information is available for 369 of 443 barrier and unknown culverts, including all County and private crossings. Values have not yet been computed for culverts under other ownerships. These estimates are provided for each crossing upstream to the next natural or artificial (human made) barrier.

Of the 122 County culverts with barrier or unknown status, 6 have greater than 10,000 m² of upstream habitat area, 28 have between 1,000 and 10,000 m², 34 have between 200 and 1000 m², and 21 have less than 200 m² habitat area. The 33 sites with an estimated habitat value of zero are left off this list.

Of the 204 privately-owned culverts with barrier or unknown status, 5 have greater than 10,000 m² of upstream habitat area, 28 have between 1,000 and 10,000 m², 47 have between 200 and 1000 m², and 63 have less than 200 m² habitat area. The 61 sites with an estimated habitat value of zero are left off this list.

Of the 117 culverts with barrier or unknown status under other public ownership, 3 have greater than 10,000 m² of upstream habitat area, 4 have between 1,000 and 10,000 m², 9 have between 200 and 1000 m², and 5 have less than 200 m² habitat area. The 24 sites with an estimated habitat value of zero are left off this list, as are the 72 sites for which no weighted habitat area estimate is currently available.

[See Appendix A, Table 7]

FIELD-BASED UPSTREAM HABITAT SURVEYS

Collectively, our project team completed field-based habitat assessments for 36 sites. Together with surveys conducted by WDFW and other groups, a total of 152 sites have physical habitat survey data available. For each of these sites, we calculated Priority Index values for habitat from a given culvert upstream to the end of potential habitat (at the natural fish passage barrier) regardless of whether other blocking crossings were present. Spawning area, rearing area, and lineal gain are also shown. Sites for which a physical habitat survey has not yet been conducted are left off of this list.

[See Appendix A, Table 8]

BARRIER CLUSTERS AND CROSSING ORDERS

An important consideration in selecting barrier culverts for replacement is the presence of up- or downstream barrier crossings. As described previously, we classified barriers (of all types and ownerships) on the same system into “clusters” and assigned each barrier an “order” depending on its position in the system. After classification, we found that 79 of the 443 barrier culverts in the Skagit Basin have a barrier order of ‘0’, meaning that no other barrier crossings are present on the stream system. 57 crossings have a barrier order of ‘1’, meaning that they are the most downstream barrier in a system with more than one barrier present. 208 crossings have between 2 and 5 downstream barriers, and 87 crossings had more than 5 downstream barriers (Table 3). Twelve crossings were located above natural barriers and were not assigned a crossing order.

Table 3. Summary of Crossing Orders by Ownership.

All Culverts (n = 443):

<i>Crossing Order</i>	<i>> 10,000 M²</i>	<i>1,000 to 10,000 M²</i>	<i>200 to 1,000 M²</i>	<i>0 to 100 M²</i>	<i>0 M²</i>	<i>No Habitat Estimate</i>	<i>Total</i>
0	3	16	13	6	27	14	79
1	1	11	12	11	16	6	57
2 - 5	5	24	44	47	46	42	208
5 or more	4	6	18	25	22	12	87
Above Natural Barrier	1	3	3	1	4	0	12
Total	14	60	90	90	115	74	443

[See Appendix A, Table 9]

INTERSECTION WITH STATE INJUNCTION CULVERTS

A focus on streams where Washington State-owned culvert replacement was mandated by the 2013 federal court culvert injunction, subsequently affirmed by the United States Supreme Court (Washington v. United States), may potentially allow project proponents to maximize habitat gains by repairing barrier crossings on the same system. Twenty State-owned barrier culverts on the so-called “injunction list” have one or more downstream barrier culverts of other ownerships. Three injunction list barrier culverts have other State-owned barrier culverts downstream. In the other direction, nineteen injunction list barrier culverts have upstream barrier culverts of other ownerships, and four injunction list barrier culverts have other upstream barrier culverts that are also on the State injunction list.

[See Appendix A, Table 10]

RECOMMENDATIONS FOR FURTHER STUDY

As described in this report, SRSC, SFEG, SKCO and USIT have been working together since 2015 to update and extend the culvert inventory in the Skagit basin, to confirm the barrier status of likely barrier culverts, and to develop methods for optimizing groups of culverts for improvement based on specific resources of concern and the priorities of available funding sources. Although we have made a great deal of progress, there continue to be a large number of sites where fish passage conditions are unknown, particularly in Snohomish County and various municipalities within the basin. These include sites mapped as "unknown" where limited data are available, sites that require additional "Level B" data collection in order to make a passability determination, and sites where it appears stream crossings are likely present but have not been mapped. High priority examples of unknown sites were surveyed for the current project, but the team quickly realized that resources allocated in the original grant were not sufficient to cover all such sites.

Thus, our work focused largely on county and privately-owned culverts within Skagit County. Culvert and habitat assessment efforts in the remaining portions of the basin should continue, first by completing assessments for likely barriers but followed by ongoing work to update older records for all culverts, even those previously thought to be passable. As culvert or stream conditions change over time, passable sites can become barriers, so current records are critical to our understanding of the state of fish passage barriers in the Skagit River Basin.

Additionally, our crews often encountered difficulty in collecting habitat data sufficient to develop PI values for all sites, given private property and other accessibility concerns. Where surveys have been possible, assessments have been relatively time-consuming to complete. As a result, many sites have little or no habitat information available, so it is difficult to determine the potential habitat to be gained by correcting barriers at some sites compared to others. Estimates of habitat upstream of barriers using remote sensing data can help to bridge this gap, but as discussed previously, currently available GIS tools are outdated, are not readily comparable to physical habitat assessments, and are based on older, often inaccurate hydrography layers.

Recent development by SRSC of a high-resolution hydrography layer for the Skagit basin has created an opportunity to remedy this by using it as the basis for an improved GIS tool to estimate habitat upstream of crossings and derive habitat measurements more comparable to field data. Habitat data collected at more than 36 sites for the current project can be used to assess the accuracy of the estimates. The tool will not only provide a consistent mean of evaluating and comparing habitat gains for all known sites, but can be set up in such a way as to allow new barrier information to be incorporated as it comes in. This will help to ensure that barrier counts and habitat estimates reflect our current understanding of on-the-ground conditions.

These tasks, if completed, will strengthen our already-improved knowledge of barrier culvert crossings in the Skagit River Basin. The initial work of merging datasets, correcting mapping and data errors, and constructing a searchable database for the watershed is complete, and methods for comparing and optimizing groups of culverts for replacement have been developed. This will allow future work such as the tasks recommended here to be integrated smoothly. Beyond this, projects to assess barrier crossings and habitat in regions of the Skagit Basin outside of our defined study area, such as the Samish River and the Skagit River Delta, should be pursued.

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APPENDIX A: FINAL REPORT TABLES

Table 1: County Barrier Culvert Overview

Barrier and Unknown:

County	Barrier	Unknown Status	Total
Skagit	92	8	100
Snohomish	15	7	22
Whatcom	0	0	0
Total	107	15	122

Passability (Barriers Only)

County	0% Passable	33% Passable	67% Passable	Unknown	Total
Skagit	29	34	25	4	92
Snohomish	3	2	2	8	15
Whatcom	0	0	0	0	0
Total	32	36	27	12	107

Individual Details for Culverts (n = 122):

Site ID	Owner Name	County	Most Recent Visit	Road Name	Stream Name	Barrier Status	% Passability	Barrier Reason
03.0183 1.20	Skagit County	Skagit	2/13/2019	Starbird Road	Unnamed	Barrier	0%	Drop and Slope
03.0278 0.10	Skagit County	Skagit	6/12/2019	Hoehn Rd	Fender Creek	Barrier	0%	Slope
03.0280 0.00	Skagit County	Skagit	2/10/1997	Utopia Rd	Wiseman Creek	Barrier	0%	Tidegate
04.0644 0.20	Skagit County	Skagit	2/28/2019	Concrete Sauk	Unnamed	Barrier	0%	Drop and Slope
931570	Skagit County	Skagit	10/26/2010	Cascade Trail	Eagle Creek	Barrier	0%	Drop
990608	Snohomish County	Snohomish	3/4/1997	Pioneer Hwy	Unnamed	Barrier	0%	Velocity
994218	Skagit County	Skagit	10/31/2019	Sauk Store Rd	Unnamed	Barrier	0%	Drop and Slope
CC11	Snohomish County	Snohomish	2/6/2001	Clear Creek Rd	Unnamed	Barrier	0%	Drop
CC2	Snohomish County	Snohomish	7/21/2014	Mountain Loop Hwy	Goodman Creek	Barrier	0%	Drop
CD5	Skagit County	Skagit	12/9/2010	Sauk City Rd	Unnamed	Barrier	0%	Drop
CD6	Skagit County	Skagit	2/2/2011	Sauk Store Rd	Unnamed	Barrier	0%	Drop
CR56	Skagit County	Skagit	4/4/2019	Franklin Rd	Unnamed	Barrier	0%	Slope
CR76	Skagit County	Skagit	4/19/2016	Starbird Rd	Unnamed	Barrier	0%	Slope
CR80	Skagit County	Skagit	4/19/2016	Starbird Rd	Unnamed	Barrier	0%	Drop
GN16	Skagit County	Skagit	3/17/2016	South Skagit Highway	Sorenson Creek	Barrier	0%	Drop and Slope
GR40	Skagit County	Skagit	3/9/2011	Challenger Rd	Unnamed	Barrier	0%	Slope
GR44	Skagit County	Skagit	9/29/2010	Challenger Rd	Ebing Creek	Barrier	0%	Drop
HC.SKCO5	Skagit County	Skagit	11/19/2019	Cokedale Ln	Dairy Creek	Barrier	0%	Drop and Slope
HC46	Skagit County	Skagit	12/13/2017	Fruitdale Rd	Unnamed	Barrier	0%	Slope
HC52	Skagit County	Skagit	1/24/2019	Fruitdale Rd	Unnamed	Barrier	0%	Slope
HC86	Skagit County	Skagit	12/6/2017	Pipeline Rd	Pipeline Creek	Barrier	0%	Drop and Slope
HC88	Skagit County	Skagit	12/13/2017	Pipeline Rd	Pipeline Creek	Barrier	0%	Drop and Slope
HC91	Skagit County	Skagit	4/6/2011	Fruitdale Rd	Unnamed	Barrier	0%	Slope
HC92	Skagit County	Skagit	4/6/2011	Mosier Rd	Unnamed	Barrier	0%	Slope
IL26	Skagit County	Skagit	5/24/2016	Martin Rd	Martin Slough	Barrier	0%	Slope
IL6	Skagit County	Skagit	1/30/2018	Rockport Cascade Rd	Obrian Creek	Barrier	0%	Drop and Slope
JB.SRSC1	Skagit County	Skagit	12/6/2017	Clark Rd	Unnamed	Barrier	0%	Debris
JB28	Skagit County	Skagit	11/15/2017	Rockport Cascade Rd	Unnamed	Barrier	0%	Slope
LA11	Skagit County	Skagit	12/11/2018	South Skagit Hwy	Unnamed	Barrier	0%	Slope
RC4	Skagit County	Skagit	1/15/2018	Concrete Sauk Valley Rd.	Hobbit Creek	Barrier	0%	Drop and Slope
RC5	Skagit County	Skagit	2/7/2018	Concrete-Sauk Valley Rd	Osterman Creek	Barrier	0%	Drop and Slope
SP1	Skagit County	Skagit	1/30/2018	E Sauk Prarie Rd	Prairie Creek	Barrier	0%	Drop and Slope
03.0181 5.76	Snohomish County	Snohomish	4/19/2016	English Grade Rd	Fisher Creek	Barrier	33%	Drop
03.0183 0.10	Skagit County	Skagit	12/17/2009	Franklin Rd	Unnamed	Barrier	33%	Drop
03.0183 0.70	Skagit County	Skagit	1/25/2018	Bonnieview Lane	Unnamed	Barrier	33%	Velocity and Depth
03.0196 0.10	Snohomish County	Snohomish	4/19/2016	324th St NW	Unnamed	Barrier	33%	Depth
04.0373 0.10	Skagit County	Skagit	6/5/2013	S Skagit Hwy	Unnamed	Barrier	33%	Slope
04.0659 0.31	Skagit County	Skagit	4/25/2018	Concrete Sauk Valley	Aldon Creek	Barrier	33%	Drop
04.0675 0.54	Skagit County	Skagit	1/30/2018	Concrete-Sauk Valley Rd	Rudd Creek	Barrier	33%	Drop
930831	Skagit County	Skagit	12/8/2009	Bulson Rd	Unnamed	Barrier	33%	Slope
933580	Skagit County	Skagit	12/21/2018	Cedardale Road	Unnamed	Barrier	33%	Depth
994213	Skagit County	Skagit	9/19/2001	Sauk Connection Rd	Unnamed	Barrier	33%	Slope
995440	Skagit County	Skagit	2/13/2019	Cascade Trail	Unnamed	Barrier	33%	Slope
AR8	Skagit County	Skagit	4/20/2016	Hamilton Cemetery Rd	Mannser Creek	Barrier	33%	Slope
AR9	Skagit County	Skagit	5/23/2016	Hamilton Cemetery Rd	Red Cabin Creek	Barrier	33%	Velocity
CD4	Skagit County	Skagit	6/5/2013	Sauk City Rd	Unnamed	Barrier	33%	Slope
CR142	Skagit County	Skagit	6/7/2018	Bulson Rd	Bulson Creek	Barrier	33%	Slope
CR26	Skagit County	Skagit	1/19/2016	Cascade Ridge Rd	Carpenter Creek	Barrier	33%	Velocity
CR3	Skagit County	Skagit	1/30/2019	Conway Hill Rd	Unnamed	Barrier	33%	Slope
CR60	Skagit County	Skagit	1/25/2018	Pacific Highway	Unnamed	Barrier	33%	Slope
CR67	Skagit County	Skagit	4/4/2019	Haugen	Unnamed	Barrier	33%	Drop and Slope
CR77	Skagit County	Skagit	4/19/2016	Bulson Rd	Starbird Creek	Barrier	33%	Other
GN18	Skagit County	Skagit	3/20/2019	S Skagit Hwy	Gilligan Creek	Barrier	33%	Slope
GN19	Skagit County	Skagit	1/9/2017	South Skagit Highway	Stevens Creek	Barrier	33%	Slope
GR18	Skagit County	Skagit	5/29/2018	Concrete Sauk Valley Rd	Lorenzan Creek	Barrier	33%	Velocity
HC.SRSC1	Skagit County	Skagit	1/24/2019	Fruitdale Road	Unnamed	Barrier	33%	Drop and Slope
HC108	Skagit County	Skagit	4/4/2019	Duffy	Unnamed	Barrier	33%	Drop
HC109	Skagit County	Skagit	4/4/2019	Duffy	Unnamed	Barrier	33%	Drop
HC87	Skagit County	Skagit	12/13/2017	Pipeline Rd	Pipeline Creek	Barrier	33%	Slope
HC90	Skagit County	Skagit	12/13/2017	Pipeline Rd	Unnamed	Barrier	33%	Drop and Slope
IL9	Skagit County	Skagit	1/30/2018	Rockport Cascade Rd	Unnamed	Barrier	33%	Drop
JB29	Skagit County	Skagit	10/15/2017	Rockport Cascade Rd	Unnamed	Barrier	33%	Velocity and Depth
JB38	Skagit County	Skagit	12/14/2018	South Cascade Rd	Clark Creek	Barrier	33%	Slope
NC50	Skagit County	Skagit	3/28/2018	Fox Rd	Unnamed	Barrier	33%	Velocity
RC6	Skagit County	Skagit	2/7/2018	Concrete-Sauk Valley Rd	Osterman Creek East	Barrier	33%	Drop and Slope
SF104	Skagit County	Skagit	10/29/2019	Bassett Rd	Unnamed	Barrier	33%	Drop and Slope
SF114	Skagit County	Skagit	1/10/2001	Fredrickson Rd	Unnamed	Barrier	33%	Drop
SP23	Skagit County	Skagit	12/5/2018	Dearinger Park Rd.	Unnamed	Barrier	33%	Velocity
03.0181 0.55	Skagit County	Skagit	4/18/2016	Cedardale Rd	Fisher Creek	Barrier	67%	Drop
03.0181 2.45	Skagit County	Skagit	4/18/2016	Starbird Rd	Fisher Creek	Barrier	67%	Drop
03.0182 1.85	Snohomish County	Snohomish	3/28/2018		Milltown Creek	Barrier	67%	Velocity and Depth
04.0434A 0.00	Skagit County	Skagit	6/13/2018	Dalles Rd	Lorenzan Creek	Barrier	67%	Drop
CC10	Snohomish County	Snohomish	2/6/2001	Mountain Loop Hwy	Unnamed	Barrier	67%	Slope
CR188	Skagit County	Skagit	2/8/2018	Cascade Ridge Rd	Unnamed	Barrier	67%	Drop and Slope
GN3	Skagit County	Skagit	4/4/2019	Potts Rd	Unnamed	Barrier	67%	Slope
GR10	Skagit County	Skagit	10/30/2019	Cascade Trail	Fish Creek	Barrier	67%	Depth
GR17	Skagit County	Skagit	6/12/2018	Concrete Rd	Lorenzan Creek	Barrier	67%	Velocity
HC110	Skagit County	Skagit	6/7/2018	Hoehn Rd	Unnamed	Barrier	67%	Depth
HC60	Skagit County	Skagit	12/16/2009	Mosier Rd	Unnamed	Barrier	67%	Velocity
HC72	Skagit County	Skagit	12/6/2017	Lyman-Hamilton Rd	Unnamed	Barrier	67%	Slope
HC85	Skagit County	Skagit	1/3/2018	Pipeline Rd	Pipeline Creek	Barrier	67%	Velocity
IL.SRSC1	Skagit County	Skagit	1/30/2018	Rockport Cascade Rd.	Unnamed	Barrier	67%	Slope
IL10	Skagit County	Skagit	1/22/2019	Rockport Cascade Rd	Unnamed	Barrier	67%	Slope
IL11	Skagit County	Skagit	5/24/2016	Martin Ranch Rd	Unnamed	Barrier	67%	Drop and Slope
IL12	Skagit County	Skagit	5/24/2016	Martin Ranch Rd	Unnamed	Barrier	67%	Drop and Slope
IL3	Skagit County	Skagit	11/20/2018	Rockport Cascade Rd	Unnamed	Barrier	67%	Slope
JB.SRSC2	Skagit County	Skagit	1/3/2018	Clark Rd	Unnamed	Barrier	67%	Slope
JB22	Skagit County	Skagit	8/23/2016	Cascade Ridge Rd	Unnamed	Barrier	67%	Velocity and Depth
JB25	Skagit County	Skagit	11/29/2017	Rockport Cascade Rd	Clark Creek	Barrier	67%	Slope
JB34	Skagit County	Skagit	11/29/2017	Clark Rd	Clark Creek	Barrier	67%	Velocity

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JB35	Skagit County	Skagit	1/31/2018	Clark Rd	Clark Creek	Barrier	67%	Drop
LA5	Skagit County	Skagit	1/31/2018	South Skagit Highway	Nettles Pond	Barrier	67%	Drop
NC136	Skagit County	Skagit	5/17/2016	Mountain View Rd	Unnamed	Barrier	67%	Velocity
SF112	Skagit County	Skagit	1/10/2001	Fredrickson Rd	Unnamed	Barrier	67%	Slope
SP.SKCO1	Skagit County	Skagit	12/5/2018	Dearinger Park Rd.	Unnamed	Barrier	67%	Depth
03.0279 0.10	Skagit County	Skagit	10/29/2019	Hoehn Rd	Coal Creek	Unknown	Unknown	Level B - Awaiting Results
933794	Skagit County	Skagit	6/4/2016	Debays Isle Road	Debays Slough	Unknown	Unknown	Level B - Slough
AR28	Skagit County	Skagit	3/1/2017	Lyman Hamilton Rd	Careys Creek	Unknown	Unknown	Level B - Slough
CD11	Skagit County	Skagit	1/1/1901		Unnamed	Unknown	Unknown	Unknown
CR144	Snohomish County	Snohomish	1/1/1901	Logen Rd	Unnamed	Unknown	Unknown	Unknown
CR216	Snohomish County	Snohomish	6/9/1999	Pacific Hwy	Unnamed	Barrier	Unknown	Slope
CR219	Snohomish County	Snohomish	6/9/1999	Detting Rd	Unnamed	Unknown	Unknown	Level B - Survey Needed
CR65	Snohomish County	Snohomish	6/8/1999	324th St NW	Unnamed	Unknown	Unknown	Unknown
CR66	Snohomish County	Snohomish	6/8/1999	Countyline Rd	Unnamed	Barrier	Unknown	Unknown
CR84	Snohomish County	Snohomish	4/19/2016	Brandstrom Rd	Fisher Creek	Barrier	Unknown	Depth
DC14	Snohomish County	Snohomish	5/12/2000	N Sauk River Rd	Unnamed	Barrier	Unknown	Slope
DC15	Snohomish County	Snohomish	5/12/2000	N Sauk River Rd	Unnamed	Unknown	Unknown	Unknown
DC9	Snohomish County	Snohomish	1/1/1997	Sauk Prairie Rd crossing	Unnamed	Barrier	Unknown	Slope
FC14	Skagit County	Skagit	1/31/2018	Cedar Grove Rd	Unnamed	Unknown	Unknown	Level B - Slough
HC41	Skagit County	Skagit	1/9/2018	footpath @ N. State	Dairy Creek	Unknown	Unknown	Level B - Survey Needed
HC62	Skagit County	Skagit	1/10/2018	Minkler Rd	Little Coal Creek	Unknown	Unknown	Level B - Survey Needed
IL25	Skagit County	Skagit	5/24/2016	Martin Rd	Unnamed	Unknown	Unknown	Level B - Slough
JB31	Skagit County	Skagit	11/15/2017	Fish Hatchery Ln	Hatchery Creek	Barrier	Unknown	Undersized
LA2	Skagit County	Skagit	5/10/1999	S Skagit Hwy	Unnamed	Barrier	Unknown	Drop
MO4	Snohomish County	Snohomish	5/11/2000	Mountain Loop Hwy	Unnamed	Barrier	Unknown	Slope
MO5	Snohomish County	Snohomish	5/11/2000	Mountain Loop Hwy	Unnamed	Barrier	Unknown	Drop
MO7	Snohomish County	Snohomish	5/11/2000	Mountain Loop Hwy	Unnamed	Barrier	Unknown	Slope
SF98	Skagit County	Skagit	3/5/1999	Fruitdale Rd	Brickyard Creek	Barrier	Unknown	Unknown
SP16	Snohomish County	Snohomish	8/28/2007	Sauk Prairie Rd	Dutch Creek	Unknown	Unknown	Level B - Survey Needed
SP21	Skagit County	Skagit	5/12/2000	E. Sauk Prairie Road	Unnamed	Barrier	Unknown	Slope
SP30	Snohomish County	Snohomish	11/13/2000	Crawford Loop Rd	Wakon Creek	Unknown	Unknown	Unknown
XID1470	Snohomish County	Snohomish	8/23/2007	Sauk Prairie Rd	Unnamed	Unknown	Unknown	Level B - Survey Needed

Table 2: Private Barrier Culvert Overview

Barrier and Unknown:

County	Barrier	Unknown Status	Total
Skagit	149	31	180
Snohomish	18	6	24
Whatcom	0	0	0
Total	167	37	204

Passability (Barriers Only)

County	0% Passable	33% Passable	67% Passable	Unknown	Total
Skagit	32	43	38	36	149
Snohomish	1	5	4	8	18
Whatcom	0	0	0	0	0
Total	33	48	42	44	167

Individual Details for Culverts (n = 204):

Site ID	Owner Name	County	Most Recent Visit	Road Name	Stream Name	Barrier Status	% Passability	Barrier Reason
03.0196 0.68	Private	Snohomish	4/15/2008	Pleasant Hill Rd	Unnamed	Barrier	0%	Drop
03.0339A 0.10	Private	Skagit	2/2/1997	abandoned	Unnamed	Barrier	0%	Velocity
1320271	Private	Skagit	8/21/2013	Private	English Creek	Barrier	0%	Slope
132101923	Private	Skagit	10/29/2010	Private;Sauk Store Rd	Unnamed	Barrier	0%	Slope
700217	Private	Skagit	7/11/2018	Taylor Road (Private)	Unnamed	Barrier	0%	Drop
920340	Private	Skagit	3/6/2013		Unnamed	Barrier	0%	Debris
920341	Private	Skagit	3/7/2013		Trumpeter Creek	Barrier	0%	Slope
920342	Private	Skagit	3/7/2013		Trumpeter Creek	Barrier	0%	Slope
920343	Private	Skagit	3/7/2013		Trumpeter Creek	Barrier	0%	Slope
920345	Private	Skagit	3/7/2013		Trumpeter Creek	Barrier	0%	Slope
930822	Private	Skagit	12/12/2009		Unnamed	Barrier	0%	Slope
930826	Private	Skagit	12/8/2009		Unnamed	Barrier	0%	Slope
930830	Private	Skagit	11/2/2009		Unnamed	Barrier	0%	Undersized
930849	Private	Skagit	12/16/2009	Unnamed	Unnamed	Barrier	0%	Slope
930934	Private	Skagit	12/16/2009		Unnamed	Barrier	0%	Slope
931571	Private	Skagit	10/26/2010		Eagle Creek	Barrier	0%	Drop
931696	Private	Skagit	3/10/2011		Unnamed	Barrier	0%	Slope
982757	Private	Skagit	10/2/2008		Unnamed	Barrier	0%	Other
991913	Private	Skagit	1/6/1999	private; English Rd	Unnamed	Barrier	0%	Drop
991914	Private	Skagit	1/6/1999	private; English Rd	Unnamed	Barrier	0%	Drop
991915	Private	Skagit	1/6/1999	private; English Rd	Unnamed	Barrier	0%	Slope
991924	Private	Skagit	1/13/1999	logging rd; English Rd	Unnamed	Barrier	0%	Drop
995338	Private	Skagit	11/2/2009	East Conway Hill Lane	Unnamed	Barrier	0%	Slope
995382	Private	Skagit	5/20/2003		Unnamed	Barrier	0%	Slope
995383	Private	Skagit	5/20/2003	field access rd	Unnamed	Barrier	0%	Slope
CR79	Private	Skagit	12/11/2019	Fremali Ln	Starbird Creek	Barrier	0%	Judgement Call - See Notes
GR55	Private	Skagit	9/29/2010	Unnamed	Ebing Creek	Barrier	0%	Drop
HC49	Private	Skagit	12/13/2017	Access trail to powerlines		Barrier	0%	Slope
HC51	Private	Skagit	12/16/2009		Unnamed	Barrier	0%	Drop
HC94	Private	Skagit	12/9/2009	Parker Rd	Unnamed	Barrier	0%	Drop
JK5	Private	Skagit	3/16/2011	driveway	Unnamed	Barrier	0%	Slope
NC211	Private	Skagit	2/12/2008		Unnamed	Barrier	0%	Slope
NC213	Private	Skagit	5/22/2018	Pavilion Drive	Norway Park Creek	Barrier	0%	Drop and Slope
920302	Private	Skagit	1/24/2013		Martha Washington Creek	Barrier	33%	Slope
920331	Private	Skagit	2/20/2013	Juanita Pl	Unnamed	Barrier	33%	Depth
930823	Private	Skagit	11/2/2009		Unnamed	Barrier	33%	Drop
930824	Private	Skagit	11/2/2009		Unnamed	Barrier	33%	Drop
930827	Private	Skagit	12/8/2009		Unnamed	Barrier	33%	Slope
930828	Private	Skagit	12/8/2009		Unnamed	Barrier	33%	Drop
930829	Private	Skagit	12/8/2009		Unnamed	Barrier	33%	Slope
930832	Private	Skagit	12/8/2009		Unnamed	Barrier	33%	Undersized
930935	Private	Skagit	12/16/2009		Unnamed	Barrier	33%	Slope
930950	Private	Skagit	1/4/2010		Unnamed	Barrier	33%	Other
931699	Private	Skagit	3/17/2011	private	Unnamed	Barrier	33%	Slope
931896	Private	Skagit	4/6/2011		Unnamed	Barrier	33%	Other
994219	Private	Skagit	12/9/2010	private	Unnamed	Barrier	33%	Undersized
995337	Private	Skagit	5/7/2003	East Conway Hill Lane	Unnamed	Barrier	33%	Slope
999054	Private	Skagit	4/10/2008	driveway	Unnamed	Barrier	33%	Slope
999104	Private	Snohomish	4/16/2008		Fisher Creek	Barrier	33%	Slope
999107	Private	Snohomish	4/22/2008		Fisher Creek	Barrier	33%	Undersized
999792	Private	Skagit	5/20/2008		Unnamed	Barrier	33%	Drop
AR4	Private	Skagit	4/20/2016	pvt; Hamilton Cemetary Rd	Unnamed	Barrier	33%	Slope
CR100	Private	Skagit	6/7/2018	Private drive off Little	Carpenter Creek	Barrier	33%	Drop
CR128	Private	Skagit	11/8/2016	Little Mountain Road	Carpenter Creek	Barrier	33%	Velocity
CR131	Private	Skagit	11/17/2016		Unnamed	Barrier	33%	Slope
CR136	Private	Skagit	12/4/2019	Ervine Lane	Carpenter Creek	Barrier	33%	Slope
CR140	Private	Skagit	6/7/2018	Private - farm access	English Creek	Barrier	33%	Velocity and Depth
CR153	Private	Snohomish	2/7/2002		Unnamed	Barrier	33%	Tidegate
CR196	Private	Skagit	4/23/2008		Starbird Creek	Barrier	33%	Velocity
CR197	Private	Skagit	12/4/2000		Unnamed	Barrier	33%	Slope
CR201	Private	Skagit	12/28/2000	private; English Rd	Unnamed	Barrier	33%	Drop
CR88	Private	Snohomish	5/14/2008		Unnamed	Barrier	33%	Slope
DB3	Private	Skagit	7/14/2016	Dexter Ln	Unnamed	Barrier	33%	Slope
GN36	Private	Skagit	3/6/2019		Unnamed	Barrier	33%	Slope
GN6	Private	Skagit	4/22/1999	Private;Potts Rd	Unnamed	Barrier	33%	Slope
GR39	Private	Skagit	3/9/2011	Piscatore Ln	Unnamed	Barrier	33%	Undersized
HC14	Private	Skagit	12/16/2009		Unnamed	Barrier	33%	Depth
HC54	Private	Skagit	12/16/2009		Unnamed	Barrier	33%	Slope
HC55	Private	Skagit	12/16/2009		Unnamed	Barrier	33%	Slope
HC58	Private	Skagit	12/16/2009	Cordy Ln	Unnamed	Barrier	33%	Slope
ILSRSC2	Private	Skagit	7/11/2019		Unnamed	Barrier	33%	Slope
NC111	Private	Skagit	2/29/2000		Unnamed	Barrier	33%	Tidegate
NC141	Private	Skagit	4/10/2000		Unnamed	Barrier	33%	Tidegate
NC147	Private	Skagit	3/17/1999	Otter Pond Rd	Unnamed	Barrier	33%	Drop
NC148	Private	Skagit	3/17/1999	Otter Pond Rd	Unnamed	Barrier	33%	Drop
NC196	Private	Skagit	2/20/2008		Unnamed	Barrier	33%	Drop
NC41	Private	Skagit	1/10/2000		Cold Springs Creek	Barrier	33%	Slope
NC75	Private	Skagit	1/23/2001	private; Mt View Rd	Gribble Creek	Barrier	33%	Slope
SF109	Private	Skagit	12/22/2000		Unnamed	Barrier	33%	Slope
SF115	Private	Skagit	1/10/2001		Unnamed	Barrier	33%	Drop
SP8	Private	Snohomish	5/29/2018	Private Road	Everett Lake	Barrier	33%	Velocity
03.0181 4.84	Private	Snohomish	4/15/2008	private; 36th Ave NW	Fisher Creek	Barrier	67%	Depth
03.0266 0.00	Private	Skagit	10/16/2012		Brickyard Creek	Barrier	67%	Drop
1320286	Private	Skagit	4/3/2014	BPA;Walker Valley Rd	Walker Creek East Fork	Barrier	67%	Drop

Skagit Basin Barrier Culvert Analysis: Appendix A

920332	Private	Skagit	2/20/2013	Martha Dr	Unnamed	Barrier	67%	Slope
930848	Private	Skagit	12/16/2009		Unnamed	Barrier	67%	Drop
930870	Private	Skagit	12/16/2009		Unnamed	Barrier	67%	Drop
931695	Private	Skagit	3/3/2011		Careys Creek	Barrier	67%	Velocity
931697	Private	Skagit	3/10/2011		Unnamed	Barrier	67%	Slope
931899	Private	Skagit	4/6/2011		Unnamed	Barrier	67%	Slope
992697	Private	Skagit	5/14/2019	farm access rd	Maddox Creek / Big Ditch	Barrier	67%	Slope
995340	Private	Skagit	5/8/2003		Unnamed	Barrier	67%	Slope
995341	Private	Skagit	5/8/2003		Unnamed	Barrier	67%	Depth
995416	Private	Skagit	12/16/2009		Unnamed	Barrier	67%	Slope
999103	Private	Snohomish	4/16/2008	private	Fisher Creek	Barrier	67%	Velocity
999388	Private	Snohomish	5/14/2008		Unnamed	Barrier	67%	Undersized
999772	Private	Skagit	5/20/2008		Unnamed	Barrier	67%	Slope
AR26	Private	Skagit	1/2/2019		Careys Creek	Barrier	67%	Velocity
CR141	Private	Skagit	8/21/2013	Private; Little Mt Rd	English Creek	Barrier	67%	Drop
CR58	Private	Skagit	12/17/2009	Clarence Lane	Unnamed	Barrier	67%	Slope
HC16	Private	Skagit	12/9/2009		Unnamed	Barrier	67%	Slope
HC57	Private	Skagit	12/16/2009		Unnamed	Barrier	67%	Slope
HC59	Private	Skagit	12/16/2009		Unnamed	Barrier	67%	Depth
IL4	Private	Skagit	8/17/2000	private; Rockport Cascade	Obrian Slough	Barrier	67%	Slope
JB20	Private	Skagit	7/14/2016	Cascade Ridge Rd	Unnamed	Barrier	67%	Velocity and Slope
JK3	Private	Skagit	3/16/2011	driveway	Unnamed	Barrier	67%	Slope
JK4	Private	Skagit	3/16/2011	driveway	Unnamed	Barrier	67%	Slope
NC10	Private	Skagit	11/3/1999	Klahowya Rd	Klahowya Creek	Barrier	67%	Slope
NC115	Private	Skagit	2/29/2000		Unnamed	Barrier	67%	Velocity
NC12	Private	Skagit	11/4/1999		Klahowya Creek	Barrier	67%	Slope
NC13	Private	Skagit	11/4/1999	Challenge Rd	Unnamed	Barrier	67%	Slope
NC143	Private	Skagit	1/21/1999		Unnamed	Barrier	67%	Undersized
NC212	Private	Skagit	2/21/2008		Norway Park Creek	Barrier	67%	Slope
NC217	Private	Skagit	11/28/2000		Gribble Creek	Barrier	67%	Slope
NC6	Private	Skagit	11/1/1999		Klahowya Creek	Barrier	67%	Slope
NC60	Private	Skagit	1/19/2000		Cold Springs Creek	Barrier	67%	Slope
NC67	Private	Skagit	11/17/2009	railroad grade	Unnamed	Barrier	67%	Drop
NC70	Private	Skagit	1/23/2001	Cultus Ct	Gribble Creek	Barrier	67%	Slope
NC74	Private	Skagit	3/15/2017	farm rd; SR 9	Gribble Creek	Barrier	67%	Depth
NC9	Private	Skagit	11/3/1999	Challenge Rd	Klahowya Creek	Barrier	67%	Slope
SF108	Private	Skagit	12/22/2000		Unnamed	Barrier	67%	Slope
SF110	Private	Skagit	12/27/2000	access rd; Fruitdale Rd		Barrier	67%	Drop
SP4	Private	Snohomish	1/1/1997		Green Creek	Barrier	67%	Drop
920300	Private	Skagit	1/24/2013		Martha Washington Creek	Unknown	Unknown	Insufficient Data
920330	Private	Skagit	2/20/2013	Helen Dr	Unnamed	Unknown	Unknown	Level B - Survey Needed
920453	Private	Skagit	4/23/2013		Unnamed	Unknown	Unknown	Level B - Survey Needed
932312	Private	Skagit	4/17/2012		Unnamed	Unknown	Unknown	Level B - Survey Needed
933581	Private	Skagit	11/3/2015	unnamed	Unnamed	Unknown	Unknown	Level B - Survey Needed
992698	Private	Skagit	2/7/2018	private	Maddox Creek / Big Ditch	Barrier	Unknown	Depth
AR33	Private	Skagit	5/24/1999	Crown Pacific 800 Rd	Unnamed	Unknown	Unknown	Unknown
AR34	Private	Skagit	5/24/1999	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	Drop
AR35	Private	Skagit	5/24/1999	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	Other
AR36	Private	Skagit	5/24/1999	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	Drop
AR37	Private	Skagit	5/24/1999	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	Drop
CD2	Private	Skagit	1/1/1901		Unnamed	Unknown	Unknown	Unknown
CR162	Private	Snohomish	6/24/1999		Unnamed	Barrier	Unknown	Tidegate
CR166	Private	Snohomish	6/24/1999		Unnamed	Barrier	Unknown	Unknown
CR220	Private	Snohomish	6/9/1999		Unnamed	Barrier	Unknown	Drop
CR222	Private	Snohomish	6/9/1999		Unnamed	Barrier	Unknown	Slope
CR225	Private	Snohomish	6/9/1999		Unnamed	Barrier	Unknown	Tidegate
CR61	Private	Skagit	6/8/1999	Bruun Rd	Unnamed	Barrier	Unknown	Slope
CR72	Private	Skagit	6/10/1999		Unnamed	Barrier	Unknown	Drop
CR96	Private	Skagit	3/20/2013	private; Pioneer Hwy	Maddox Creek / Big Ditch	Unknown	Unknown	Level B - Survey Needed
DC2	Private	Snohomish	1/1/1997		Mouse Creek	Barrier	Unknown	Slope
DC5	Private	Snohomish	1/1/1997		Mouse Creek	Unknown	Unknown	Unknown
DC8	Private	Snohomish	1/1/1997		Unnamed	Barrier	Unknown	Unknown
FC8	Private	Skagit	8/2/2000	CP 1400 Rd	Unnamed	Barrier	Unknown	Slope
GN.SFEG1	Private	Skagit	10/16/2017	NA - Private Farm road	Day Creek Slough	Barrier	Unknown	Judgement Call - See Notes
GN12	Private	Skagit	4/22/1999		Unnamed	Unknown	Unknown	Unknown
GN14	Private	Skagit	4/22/1999		Unnamed	Barrier	Unknown	Debris
GN22	Private	Skagit	4/22/1999		Unnamed	Unknown	Unknown	Unknown
GN35	Private	Skagit	2/9/2020		Unnamed	Unknown	Unknown	Level B - Survey Needed
GN38	Private	Skagit	4/26/1999		Unnamed	Unknown	Unknown	Unknown
GN4	Private	Skagit	4/22/1999		Unnamed	Unknown	Unknown	Unknown
GN8	Private	Skagit	4/22/1999		Unnamed	Unknown	Unknown	Unknown
GR29	Private	Skagit	8/1/2000	Tyee Dr	Unnamed	Barrier	Unknown	Other
HC103	Private	Skagit	7/13/2000		Unnamed	Barrier	Unknown	Undersized
HC106	Private	Skagit	7/13/2000		Skiyou Slough	Unknown	Unknown	Unknown
HC18	Private	Skagit	6/26/2000		Unnamed	Unknown	Unknown	Unknown
HC19	Private	Skagit	6/26/2000		Unnamed	Barrier	Unknown	Drop
HC20	Private	Skagit	6/26/2000		Unnamed	Barrier	Unknown	Unknown
HC44	Private	Skagit	7/12/2000		Unnamed	Barrier	Unknown	Unknown
HC45	Private	Skagit	7/5/2000		Unnamed	Unknown	Unknown	Unknown
HC47	Private	Skagit	7/6/2000		Unnamed	Barrier	Unknown	Drop
HC48	Private	Skagit	7/6/2000		Unnamed	Barrier	Unknown	Unknown
HC63	Private	Skagit	4/17/2012	Unnamed	Unnamed	Unknown	Unknown	Level B - Survey Needed
HC64	Private	Skagit	4/17/2012		Unnamed	Unknown	Unknown	Level B - Survey Needed
HC65	Private	Skagit	4/17/2012		Unnamed	Unknown	Unknown	Level B - Survey Needed
HC66	Private	Skagit	4/17/2012		Unnamed	Unknown	Unknown	Level B - Survey Needed

Table 3: Other Public Barrier Culvert Overview

Barrier and Unknown:

County	Barriers	Unknown Status	Total
Skagit	65	35	100
Snohomish	8	1	9
Whatcom	5	3	8
Total	78	39	117

Passability (Barriers Only)

County	0% Passable	33% Passable	67% Passable	Unknown	Total
Skagit	21	25	14	5	65
Snohomish	2	0	3	3	8
Whatcom	1	2	2	0	5
Total	24	27	19	8	78

Individual Details for Culverts (n = 117):

Site ID	Site Owner Type	Owner Name	County	Most Recent Visit	Road Name	Stream Name	Barrier Status	% Passability	Barrier Reason
600050	Federal	US Department of the Interior (NPS)	Whatcom	11/18/2015	forest road; SR 20	Unnamed	Barrier	0%	Slope
920287	City	City of Mount Vernon	Skagit	1/15/2013	N 30th St	Unnamed	Barrier	0%	Slope
920346	City	City of Mount Vernon	Skagit	3/7/2013	Shoshone Dr	Trumpeter Creek	Barrier	0%	Slope
931355	City	City of Concrete	Skagit	5/29/2018	Limestone St	Lorenzan Creek	Barrier	0%	Drop
931579	City	City of Concrete	Skagit	5/15/2018	Main St	Lorenzan Creek	Barrier	0%	Slope
990091	State	State of Washington	Skagit	12/29/1997	SR 9	Norway Park Creek	Barrier	0%	Slope
990410	State	State of Washington	Skagit	1/11/2011	SR 20	Sutter Creek	Barrier	0%	Slope
991125	State	State of Washington	Skagit	9/18/2001	SR 20	Unnamed	Barrier	0%	Slope
991151	State	State of Washington	Skagit	10/27/2010	SR 20	Eagle Creek	Barrier	0%	Slope
991451	State	State of Washington	Skagit	4/16/2001	SR 9	Unnamed	Barrier	0%	Slope
994276	State	State of Washington	Skagit	7/26/2001	SR 20	Unnamed	Barrier	0%	Drop
994947	State	State of Washington	Skagit	10/18/2005	SR 20	Unnamed	Barrier	0%	Drop
995265	State	State of Washington	Skagit	11/2/2009	SR 534	Unnamed	Barrier	0%	Drop
995335	Other	Conway School District	Skagit	5/7/2003		Unnamed	Barrier	0%	Slope
997401	State	State of Washington	Skagit	5/19/2005	SR 20	Unnamed	Barrier	0%	Slope
997712	State	State of Washington	Skagit	10/18/2005	SR 530	Unnamed	Barrier	0%	Drop
CD18	State	State of Washington	Skagit	4/8/2009	SR 20	Olson Creek	Barrier	0%	Slope
CR143	Drainage District	Drainage and Diking Improvement	Snohomish	3/20/2013		Maddox Creek / Big Ditch	Barrier	0%	Tidegate
CR70	Drainage District	Drainage and Diking Improvement	Snohomish	3/20/2013		Maddox Creek / Big Ditch	Barrier	0%	Tidegate
GR23	State	State of Washington	Skagit	5/15/2018	SR 20	Lorenzan Creek	Barrier	0%	Slope
HC93	State	State of Washington	Skagit	4/6/2011	SR 9	Unnamed	Barrier	0%	Slope
JK2	State	State of Washington	Skagit	3/16/2011	SR 20	Unnamed	Barrier	0%	Slope
NC107	City	City of Mount Vernon	Skagit	1/9/2013	N35th St	Unnamed	Barrier	0%	Slope
NC166	State	State of Washington	Skagit	3/10/2003	SR 9	Unnamed	Barrier	0%	Slope
03.2970 0.00	City	City of Mount Vernon	Skagit	4/23/2013	Blodgett Rd	Flowers Creek	Barrier	33%	Slope
920285	City	City of Mount Vernon	Skagit	1/9/2013		Unnamed	Barrier	33%	Depth
920732	City	City of Mount Vernon	Skagit	3/20/2013	Anderson Rd	Martha Washington Creek	Barrier	33%	Other
931354	City	City of Concrete	Skagit	11/16/2010		Lorenzan Creek	Barrier	33%	Slope
991123	State	State of Washington	Skagit	9/15/2015	SR 20	Unnamed	Barrier	33%	Velocity
991547	State	State of Washington	Skagit	4/11/2012	SR 20	Unnamed	Barrier	33%	Slope
994216	State	State of Washington	Skagit	9/19/2001	unnamed; SR 20	Unnamed	Barrier	33%	Drop
995097	State	State of Washington	Skagit	10/19/2005	SR 20	Backus Creek	Barrier	33%	Slope
995242	State	State of Washington	Skagit	2/27/2003	I-5; NB Ext 218	Unnamed	Barrier	33%	Unknown
CR122	State	State of Washington	Skagit	3/20/2013	I-5	Martha Washington Creek	Barrier	33%	Other
CR124	City	City of Mount Vernon	Skagit	1/23/2013	Henson Rd	Martha Washington Creek	Barrier	33%	Slope
CR2	State	State of Washington	Skagit	3/10/2003	SR 534	Unnamed	Barrier	33%	Slope
CR28	City	City of Mount Vernon	Skagit	11/21/2019	E Hickox Rd	Carpenter Creek	Barrier	33%	Drop
GR22	City	City of Concrete	Skagit	5/15/2018	Superior Ave	Lorenzan Creek	Barrier	33%	Slope
GR54	State	State of Washington	Skagit	10/27/2010	SR 20	Eagle Creek	Barrier	33%	Velocity
GR9	State	State of Washington	Skagit	10/27/2010	SR 20	Fish Creek	Barrier	33%	Velocity
HC53	State	State of Washington	Skagit	3/16/2003	SR 9	Unnamed	Barrier	33%	Slope
IL14	City	City of Seattle	Skagit	5/9/2013		Unnamed	Barrier	33%	Undersized
MB7	Federal	USDA Forest Service	Whatcom	11/27/2019	USFS 11	Unnamed	Barrier	33%	Drop
MB8	Federal	USDA Forest Service	Whatcom	12/17/2019		Little Park Creek	Barrier	33%	Slope
NC122	City	City of Mount Vernon	Skagit	1/8/2013	18th St	Kulshon Creek	Barrier	33%	Slope
NC129	State	State of Washington	Skagit	1/15/2013	SR 538	Logan Creek	Barrier	33%	Slope
NC137	City	City of Mount Vernon	Skagit	1/16/2013	Alison Ave	Logan Creek	Barrier	33%	Slope
NC138	City	City of Mount Vernon	Skagit	1/15/2013	30th St	Logan Creek	Barrier	33%	Slope
NC163	State	State of Washington	Skagit	3/11/2003	SR 9	Unnamed	Barrier	33%	Slope
SF43	City	City of Burlington	Skagit	1/30/2013	Anacortes St	Gages Slough	Barrier	33%	Slope
SF49	State	State of Washington	Skagit	1/30/2013	SR 20	Gages Slough	Barrier	33%	Slope
600049	Federal	US Department of the Interior (NPS)	Whatcom	11/18/2015	forest road; SR 20	Unnamed	Barrier	67%	Depth
600051	Federal	US Department of the Interior (NPS)	Whatcom	11/19/2015	forest road; SR 20	Unnamed	Barrier	67%	Slope
920242	City	City of Sedro-Woolley	Skagit	10/17/2012	River Rd	Unnamed	Barrier	67%	Slope
920305	City	City of Burlington	Skagit	1/29/2013	N Hill Blvd	Unnamed	Barrier	67%	Depth
990641	State	State of Washington	Skagit	3/10/2003	SR 9	Unnamed	Barrier	67%	Slope
991142	State	State of Washington	Skagit	12/9/2009	SR 20	Unnamed	Barrier	67%	Slope
991146	State	State of Washington	Skagit	9/16/2015	SR 20	Childs Creek	Barrier	67%	Velocity
991150	State	State of Washington	Skagit	10/28/2015	SR 20	Eagle Creek	Barrier	67%	Velocity
991725	State	State of Washington	Skagit	2/8/2018	I-5	Maddox Creek / Big Ditch	Barrier	67%	Depth
997396	State	State of Washington	Skagit	9/22/2010	SR 20	Unnamed	Barrier	67%	Velocity
AR25	City	City of Hamilton	Skagit	1/2/2019	1st St	Careys Creek	Barrier	67%	Velocity
GR19	City	City of Concrete	Skagit	5/15/2018	Fir St	Lorenzan Creek	Barrier	67%	Depth
GR20	City	City of Concrete	Skagit	5/15/2018	S Park Ave	Lorenzan Creek	Barrier	67%	Depth
HC.SFEG1	City	City of Sedro-Woolley	Skagit	6/28/2018	Bark Park	Unnamed	Barrier	67%	Slope
LC5	Federal	USDA Forest Service	Snohomish	5/18/2000	FR 25 Rd	Swamp Creek	Barrier	67%	Slope
SF45	City	City of Burlington	Skagit	1/30/2013	E Rio Vista Blvd	Gages Slough	Barrier	67%	Slope
SF93	City	City of Sedro-Woolley	Skagit	10/17/2012	Fruitdale Rd	Brickyard Creek	Barrier	67%	Depth
TC2	Federal	USDA Forest Service	Snohomish	5/18/2000	FR 26 Rd	Unnamed	Barrier	67%	Slope
TC4	Federal	USDA Forest Service	Snohomish	5/18/2000	FR 26 Rd	Doe Creek	Barrier	67%	Slope
600052	Federal	US Department of the Interior (NPS)	Whatcom	11/19/2015	forest road; SR 20	Unnamed	Unknown	Unknown	Level B - Survey
920286	City	City of Mount Vernon	Skagit	1/9/2013	N 35th Pl	Unnamed	Unknown	Unknown	Insufficient Data
920306	City	City of Burlington	Skagit	1/30/2013	Sharon St	Gages Slough	Unknown	Unknown	Insufficient Data
920308	City	City of Burlington	Skagit	1/30/2013	Hawthorne St	Gages Slough	Unknown	Unknown	Level B - Survey
920454	City	City of Mount Vernon	Skagit	4/23/2013	Cederdale Rd	Flowers Creek	Unknown	Unknown	Insufficient Data
932350	State	State of Washington	Skagit	11/28/2012	I-5	Kulshon Creek	Unknown	Unknown	Insufficient Data
932472	State	State of Washington	Whatcom	9/11/2012	SR 20	Unnamed	Unknown	Unknown	Level B - Survey
990885	State	State of Washington	Skagit	7/6/2017	SR 530	Unnamed	Barrier	Unknown	Depth
991133	State	State of Washington	Skagit	10/6/2015	I-5	Unnamed	Unknown	Unknown	Insufficient Data
991143	State	State of Washington	Skagit	4/7/2011	SR 20	Unnamed	Unknown	Unknown	Insufficient Data
991148	State	State of Washington	Skagit	3/22/2011	SR 20	Unnamed	Unknown	Unknown	Insufficient Data
991149	State	State of Washington	Skagit	3/22/2011	SR 20	Unnamed	Unknown	Unknown	Insufficient Data
995224	State	State of Washington	Skagit	10/6/2015	I-5	Unnamed	Unknown	Unknown	Insufficient Data
995225	State	State of Washington	Skagit	10/18/2012	I-5	Unnamed	Unknown	Unknown	Level B - Survey
995434	State	State of Washington	Skagit	3/23/2011	SR 20	Unnamed	Unknown	Unknown	Insufficient Data
995436	State	State of Washington	Skagit	4/6/2017	SR 20	Unnamed	Unknown	Unknown	Level B - Survey
AR39	City	City of Hamilton	Skagit	3/1/2017	Pettit Rd	Careys Slough	Unknown	Unknown	Level B - Slough
DB2	Federal	USDA Forest Service	Skagit	1/1/1901	FR1050	Unnamed	Barrier	Unknown	Slope
DC11	Federal	USDA Forest Service	Snohomish	5/11/2000		Tiny Kisutch Creek	Barrier	Unknown	Slope
DM2	City	City of Seattle	Whatcom	5/25/2000		Babcock Creek	Unknown	Unknown	Level B - Survey
HC120	State	State of Washington	Skagit	6/27/2001	SR 20	Unnamed	Unknown	Unknown	Unknown
HC121	State	State of Washington	Skagit	6/27/2001	SR 20	Unnamed	Unknown	Unknown	Unknown
IL24	City	City of Seattle	Skagit	8/21/2000		Lucas Slough	Unknown	Unknown	Unknown
LC4	Federal	USDA Forest Service	Snohomish	5/18/2000	FR 25 Rd	Seed Orchard Creek	Barrier	Unknown	Slope

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LC6	Federal	USDA Forest Service	Snohomish	5/18/2000	FR 2540 Rd	Swamp Creek	Unknown	Unknown	Unknown
NC118	City	City of Mount Vernon	Skagit	1/8/2012		Kulshon Creek	Unknown	Unknown	Level B - Survey
NC121	City	City of Mount Vernon	Skagit	1/8/2013	Parker Way	Kulshon Creek	Unknown	Unknown	Level B - Survey
NC123	City	City of Mount Vernon	Skagit	3/6/2013	Kulshon Trail	Unnamed	Unknown	Unknown	Insufficient Data
NC124	City	City of Mount Vernon	Skagit	1/8/2013		Unnamed	Unknown	Unknown	Level B - Survey
NC125	City	City of Mount Vernon	Skagit	1/8/2013	Roosevelt Rd	Unnamed	Unknown	Unknown	Level B - Survey
NC128	City	City of Mount Vernon	Skagit	1/9/2013	N 19th St	Kulshon Creek	Unknown	Unknown	Level B - Survey
RC7	State	State of Washington	Skagit	1/1/1997	Old Concrete-Sauk Valley	Flume Creek	Unknown	Unknown	Level B - Survey
SF41	City	City of Burlington	Skagit	1/30/2013	Burlington Blvd	Gages Slough	Unknown	Unknown	Level B - Survey
SF47	City	City of Burlington	Skagit	2/25/1999	Monroe St	Gages Slough	Unknown	Unknown	Unknown
SF52	City	City of Burlington	Skagit	2/25/1999	Peacock Rd	Gages Slough	Unknown	Unknown	Unknown
SF55	State	State of Washington	Skagit	10/17/2012	SR 20	Gages Slough	Unknown	Unknown	Level B - Awaiting
SF71	City	City of Sedro-Woolley	Skagit	10/11/2012	SR 20	Brickyard Creek	Unknown	Unknown	Level B - Survey
SF78	City	City of Sedro-Woolley	Skagit	10/16/2012	F&S Grade Rd	Brickyard Creek	Unknown	Unknown	Level B - Survey
SF82	City	City of Sedro-Woolley	Skagit	10/16/2012	Jones Rd	Brickyard Creek	Unknown	Unknown	Level B - Survey
SF83	City	City of Sedro-Woolley	Skagit	10/17/2012	Sapp Rd	Brickyard Creek	Unknown	Unknown	Level B - Survey
SF87	City	City of Sedro-Woolley	Skagit	10/17/2012	Sapp Rd	Unnamed	Unknown	Unknown	Level B - Survey
SF88	City	City of Sedro-Woolley	Skagit	10/17/2012	Sapp Rd	Unnamed	Unknown	Unknown	Other
SF96	State	State of Washington	Skagit	3/5/1999		Brickyard Creek	Barrier	Unknown	Drop
SP24	City	City of Seattle	Skagit	5/12/2000	forest rd	Unnamed	Unknown	Unknown	Unknown
TC1	Federal	USDA Forest Service	Snohomish	5/18/2000	FR 26 Rd	Unnamed	Barrier	Unknown	Slope
TC5	Federal	USDA Forest Service	Skagit	5/18/2000	FR 26 Rd	Unnamed	Barrier	Unknown	Drop
TC7	Federal	USDA Forest Service	Skagit	5/18/2000	FR 26	Unnamed	Barrier	Unknown	Slope

Table 4: Passable Culverts

23 culverts assessed as barriers by pre-2009 era surveys were found to be passable by current surveys.

Site ID	Owner Type	Road Name	Stream	Most Recent Visit
04.0381 0.00	County	Baker Lake Rd	Unnamed	10/31/2019
04.1071 0.60	County	Sauk Prairie Rd	Gravel Creek	6/10/2019
991122	State	SR9	Gibble Creek	1/9/2018
991912	County	English Rd	Unnamed	2/8/2018
AR38	Private	HWY 20	Careys Creek	5/17/2018
AR43	County	Hamilton Cemetery Rd	Mannser Creek	1/16/2019
CR63	County	County Line Rd	Unnamed	1/25/2017
CR73	Private	Driveway	Unnamed	2/14/2019
DY3	County	South Lyman Ferry Rd	Unnamed	5/29/2019
FC.SRSC1	County	Concrete Sauk	Unnamed	2/14/2019
GN17	County	South Skagit Highway	Anderson Creek	6/7/2016
GN20	County	W. Gilligan	Stevens Creek	12/11/2018
GN28	Private		Stevens Creek	5/29/2019
HC.SKCO3	County	Helmick Rd	Dairy Creek	12/20/2018
JB23	County	Rockport Cascade Rd	Unnamed	11/29/2017
JB24	County	Rockport Cascade Rd	Hatchery Creek	11/15/2017
JB26	County	Rockport Cascade Rd	Washington Creek	11/29/2017
LA10	County	South Skagit HWY	Marietta Creek	12/11/2018
MB1	Federal	USFS 011	Beaver Creek	12/13/2019
NC167	County	Hull Rd	Unnamed	12/18/2018
NC168	Private	Unnamed	Lake Creek	12/18/2018
NC97	County	Beaver Lake Rd	Turner Creek	6/7/2018
RC.SKCO2	County	Concrete Sauk Valley	Granstrom Creek	4/5/2018

Table 5: Culverts Located on Slough Habitat

Five culverts are located on slough habitat, so a Level B analysis could not be completed

Site ID	Owner Type	Road Name	Stream Name	Barrier Status	% Passability	Barrier Reason
933794	County	Debays Isle Road	Debays Slough	Unknown	Unknown	Level B - Slough
AR28	County	Lyman Hamilton Rd	Careys Creek	Unknown	Unknown	Level B - Slough
AR39	City	Pettit Rd	Careys Slough	Unknown	Unknown	Level B - Slough
FC14	County	Cedar Grove Rd	Unnamed	Unknown	Unknown	Level B - Slough
IL25	County	Martin Rd	Unnamed	Unknown	Unknown	Level B - Slough

Table 6: Other sites that could not be assigned a barrier status

Eighty-six crossings could not be assigned a barrier status.

Barrier Reason	Count
Level B - Survey Needed	37
Unknown	32
Insufficient Data	14
Level B - Awaiting Results	2
Other	1

Site ID	Owner Type	Road Name	Stream Name	Most Recent Visit	Barrier Status	% Passability	Barrier Reason
03.0279 0.10	County	Hoehn Rd	Coal Creek	10/29/2019	Unknown	Unknown	Level B - Awaiting Results
600052	Federal	forest road; SR 20	Unnamed	11/19/2015	Unknown	Unknown	Level B - Survey Needed
920286	City	N 35th Pl	Unnamed	1/9/2013	Unknown	Unknown	Insufficient Data
920300	Private		Martha Washington Creek	1/24/2013	Unknown	Unknown	Insufficient Data
920306	City	Sharon St	Gages Slough	1/30/2013	Unknown	Unknown	Insufficient Data
920308	City	Hawthorne St	Gages Slough	1/30/2013	Unknown	Unknown	Level B - Survey Needed
920330	Private	Helen Dr	Unnamed	2/20/2013	Unknown	Unknown	Level B - Survey Needed
920453	Private		Unnamed	4/23/2013	Unknown	Unknown	Level B - Survey Needed
920454	City	Cederdale Rd	Flowers Creek	4/23/2013	Unknown	Unknown	Insufficient Data
932312	Private		Unnamed	4/17/2012	Unknown	Unknown	Level B - Survey Needed
932350	State	I-5	Kulshon Creek	11/28/2012	Unknown	Unknown	Insufficient Data
932472	State	SR 20	Unnamed	9/11/2012	Unknown	Unknown	Level B - Survey Needed
933581	Private	unnamed	Unnamed	11/3/2015	Unknown	Unknown	Level B - Survey Needed
991133	State	I-5	Unnamed	10/6/2015	Unknown	Unknown	Insufficient Data
991143	State	SR 20	Unnamed	4/7/2011	Unknown	Unknown	Insufficient Data
991148	State	SR 20	Unnamed	3/22/2011	Unknown	Unknown	Insufficient Data
991149	State	SR 20	Unnamed	3/22/2011	Unknown	Unknown	Insufficient Data
995224	State	I-5	Unnamed	10/6/2015	Unknown	Unknown	Insufficient Data
995225	State	I-5	Unnamed	10/18/2012	Unknown	Unknown	Level B - Survey Needed
995434	State	SR 20	Unnamed	3/23/2011	Unknown	Unknown	Insufficient Data
995436	State	SR 20	Unnamed	4/6/2017	Unknown	Unknown	Level B - Survey Needed
AR33	Private	Crown Pacific 800 Rd	Unnamed	5/24/1999	Unknown	Unknown	Unknown
CD11	County		Unnamed	1/1/1901	Unknown	Unknown	Unknown
CD2	Private		Unnamed	1/1/1901	Unknown	Unknown	Unknown
CR144	County	Logen Rd	Unnamed	1/1/1901	Unknown	Unknown	Unknown
CR219	County	Dettling Rd	Unnamed	6/9/1999	Unknown	Unknown	Level B - Survey Needed
CR65	County	324th St NW	Unnamed	6/8/1999	Unknown	Unknown	Unknown
CR96	Private	private; Pioneer Hwy	Maddox Creek / Big Ditch	3/20/2013	Unknown	Unknown	Level B - Survey Needed
DC15	County	N Sauk River Rd	Unnamed	5/12/2000	Unknown	Unknown	Unknown
DC5	Private		Mouse Creek	1/1/1997	Unknown	Unknown	Unknown
DM2	City		Babcock Creek	5/25/2000	Unknown	Unknown	Level B - Survey Needed
GN12	Private		Unnamed	4/22/1999	Unknown	Unknown	Unknown
GN22	Private		Unnamed	4/22/1999	Unknown	Unknown	Unknown
GN35	Private		Unnamed	2/9/2020	Unknown	Unknown	Level B - Survey Needed
GN38	Private		Unnamed	4/26/1999	Unknown	Unknown	Unknown
GN4	Private		Unnamed	4/22/1999	Unknown	Unknown	Unknown
GN8	Private		Unnamed	4/22/1999	Unknown	Unknown	Unknown
HC106	Private		Skiyou Slough	7/13/2000	Unknown	Unknown	Unknown
HC120	State	SR 20	Unnamed	6/27/2001	Unknown	Unknown	Unknown
HC121	State	SR 20	Unnamed	6/27/2001	Unknown	Unknown	Unknown
HC18	Private		Unnamed	6/26/2000	Unknown	Unknown	Unknown
HC41	County	footpath @ N. State	Dairy Creek	1/9/2018	Unknown	Unknown	Level B - Survey Needed
HC45	Private		Unnamed	7/5/2000	Unknown	Unknown	Unknown
HC62	County	Minkler Rd	Little Coal Creek	1/10/2018	Unknown	Unknown	Level B - Survey Needed
HC63	Private	Unnamed	Unnamed	4/17/2012	Unknown	Unknown	Level B - Survey Needed
HC64	Private		Unnamed	4/17/2012	Unknown	Unknown	Level B - Survey Needed
HC65	Private		Unnamed	4/17/2012	Unknown	Unknown	Level B - Survey Needed
HC66	Private		Unnamed	4/17/2012	Unknown	Unknown	Level B - Survey Needed
IL20	Private		Barnaby Slough	8/21/2000	Unknown	Unknown	Insufficient Data
IL24	City		Lucas Slough	8/21/2000	Unknown	Unknown	Unknown
IL5	Private		Obrian Slough	8/17/2000	Unknown	Unknown	Unknown
JB8	Private		Unnamed	8/10/2000	Unknown	Unknown	Unknown
LC6	Federal	FR 2540 Rd	Swamp Creek	5/18/2000	Unknown	Unknown	Unknown
NC118	City		Kulshon Creek	1/8/2012	Unknown	Unknown	Level B - Survey Needed
NC120	Private		Kulshon Creek	1/8/2013	Unknown	Unknown	Level B - Survey Needed
NC121	City	Parker Way	Kulshon Creek	1/8/2013	Unknown	Unknown	Level B - Survey Needed
NC123	City	Kulshon Trail	Unnamed	3/6/2013	Unknown	Unknown	Insufficient Data
NC124	City		Unnamed	1/8/2013	Unknown	Unknown	Level B - Survey Needed
NC125	City	Roosevelt Rd	Unnamed	1/8/2013	Unknown	Unknown	Level B - Survey Needed
NC128	City	N 19th St	Kulshon Creek	1/9/2013	Unknown	Unknown	Level B - Survey Needed
NC202	Private		Unnamed	6/8/2000	Unknown	Unknown	Unknown
NC82	Private	private; McLaughlin Rd	Unnamed	2/9/2000	Unknown	Unknown	Insufficient Data
NC88	Private	private	Trumpeter Creek	3/11/2013	Unknown	Unknown	Level B - Survey Needed
NC89	Private		Trumpeter Creek	3/11/2013	Unknown	Unknown	Level B - Survey Needed
RC7	State	Old Concrete-Sauk Valley	Flume Creek	1/1/1997	Unknown	Unknown	Level B - Survey Needed
SF41	City	Burlington Blvd	Gages Slough	1/30/2013	Unknown	Unknown	Level B - Survey Needed
SF47	City	Monroe St	Gages Slough	2/25/1999	Unknown	Unknown	Unknown
SF52	City	Peacock Rd	Gages Slough	2/25/1999	Unknown	Unknown	Unknown
SF55	State	SR 20	Gages Slough	10/17/2012	Unknown	Unknown	Level B - Awaiting Results
SF61	Private		Gages Slough	2/25/1999	Unknown	Unknown	Unknown
SF71	City	SR 20	Brickyard Creek	10/11/2012	Unknown	Unknown	Level B - Survey Needed
SF78	City	F&S Grade Rd	Brickyard Creek	10/16/2012	Unknown	Unknown	Level B - Survey Needed
SF82	City	Jones Rd	Brickyard Creek	10/16/2012	Unknown	Unknown	Level B - Survey Needed
SF83	City	Sapp Rd	Brickyard Creek	10/17/2012	Unknown	Unknown	Level B - Survey Needed
SF87	City	Sapp Rd	Unnamed	10/17/2012	Unknown	Unknown	Level B - Survey Needed
SF88	City	Sapp Rd	Unnamed	10/17/2012	Unknown	Unknown	Other
SF92	Private		Brickyard Creek	3/5/1999	Unknown	Unknown	Unknown
SP10	Private		Everett Creek	1/1/1997	Unknown	Unknown	Level B - Survey Needed
SP16	County	Sauk Prairie Rd	Dutch Creek	8/28/2007	Unknown	Unknown	Level B - Survey Needed
SP17	Private		Unnamed	1/1/1997	Unknown	Unknown	Unknown
SP24	City	forest rd	Unnamed	5/12/2000	Unknown	Unknown	Unknown
SP30	County	Crawford Loop Rd	Wakon Creek	11/13/2000	Unknown	Unknown	Unknown
SP31	Private		Wakon Creek	11/13/2000	Unknown	Unknown	Unknown
SP34	Private		Wakon Creek	11/13/2000	Unknown	Unknown	Unknown
SP6	Private		Green Creek	1/1/1997	Unknown	Unknown	Unknown
XID1470	County	Sauk Prairie Rd	Unnamed	8/23/2007	Unknown	Unknown	Level B - Survey Needed

Table 7: GIS-Derived Upstream Habitat Estimates

Weighted Habitat Area, per Smith and Waldo 2003

Owner Type	> 10,000 M ²	1,000 to 10,000 M ²	200 to 1,000 M ²	0 to 200 M ²	Total
County	6	28	34	21	89
Private	5	28	47	63	144
Other Public	3	4	9	5	21
Total	14	60	90	89	254

Site ID	Site Owner Type	Owner Name	County	Most Recent Visit	Road	Stream	Barrier Status	Passability	Barrier Reason	Barhab Weighted
NC9	Private	Private	Skagit	11/3/1999	Challenge Rd	Klahowya Creek	Barrier	67%	Slope	111,454
IL20	Private	Private	Skagit	8/21/2000		Barnaby Slough	Unknown	Unknown	Insufficient Data	73,932
NC136	County	Skagit County	Skagit	5/17/2016	Mountain View Rd	Unnamed	Barrier	67%	Velocity	52,298
HC14	Private	Private	Skagit	12/16/2009		Unnamed	Barrier	33%	Depth	39,273
AR39	City		Skagit	3/1/2017	Pettit Rd	Careys Slough	Unknown	Unknown	Level B - Slough	33,143
LC6	Federal		Snohomish	5/18/2000	FR 2540 Rd	Swamp Creek	Unknown	Unknown	Unknown	30,190
AR26	Private	Private	Skagit	1/2/2019		Careys Creek	Barrier	67%	Velocity	23,710
CR131	Private	Private	Skagit	11/17/2016		Unnamed	Barrier	33%	Slope	21,380
IL11	County	Skagit County	Skagit	5/24/2016	Martin Ranch Rd	Unnamed	Barrier	67%	Drop and Slope	19,810
AR9	County	Skagit County	Skagit	5/23/2016	Hamilton Cemetary Rd	Red Cabin Creek	Barrier	33%	Velocity	19,654
SF104	County		Skagit	10/29/2019	Bassett Rd	Unnamed	Barrier	33%	Drop and Slope	17,907
CR65	County		Snohomish	6/8/1999	324th St NW	Unnamed	Unknown	Unknown	Unknown	15,352
CD18	State		Skagit	4/8/2009	SR 20	Olson Creek	Barrier	0%	Slope	15,179
03.0181 0.55	County		Skagit	4/18/2016	Cedardale Rd	Fisher Creek	Barrier	67%	Drop	12,924
CR26	County	Skagit County	Skagit	1/19/2016	Cascade Ridge Rd	Carpenter Creek	Barrier	33%	Velocity	8,745
CR96	Private	Private	Skagit	3/20/2013	private; Pioneer Hwy	Maddox Creek / Big Ditch	Unknown	Unknown	Level B - Survey Needed	8,668
03.0279 0.10	County		Skagit	10/29/2019	Hoehn Rd	Coal Creek	Unknown	Unknown	Level B - Awaiting Results	8,564
MO4	County		Snohomish	5/11/2000	Mountain Loop Hwy	Unnamed	Barrier	Unknown	Slope	7,463
IL26	County	Skagit County	Skagit	5/24/2016	Martin Rd	Martin Slough	Barrier	0%	Slope	7,376
03.0181 2.45	County		Skagit	4/18/2016	Starbird Rd	Fisher Creek	Barrier	67%	Drop	7,158
NC6	Private	Private	Skagit	11/1/1999		Klahowya Creek	Barrier	67%	Slope	6,925
IL12	County	Skagit County	Skagit	5/24/2016	Martin Ranch Rd	Unnamed	Barrier	67%	Drop and Slope	6,324
NC163	State		Skagit	3/11/2003	SR 9	Unnamed	Barrier	33%	Slope	6,162
03.0181 4.84	Private	Private	Snohomish	4/15/2008	private; 36th Ave NW	Fisher Creek	Barrier	67%	Depth	5,974
SP4	Private	Private	Snohomish	1/1/1997		Green Creek	Barrier	67%	Drop	5,620
CR196	Private	Private	Skagit	4/23/2008		Starbird Creek	Barrier	33%	Velocity	4,906
GN18	County		Skagit	3/20/2019	S Skagit Hwy	Gilligan Creek	Barrier	33%	Slope	4,729
DC2	Private	Private	Snohomish	1/1/1997		Mouse Creek	Barrier	Unknown	Slope	4,530
NC89	Private	Private	Skagit	3/11/2013		Trumpeter Creek	Unknown	Unknown	Level B - Survey Needed	4,521
NC60	Private	Private	Skagit	1/19/2000		Cold Springs Creek	Barrier	67%	Slope	4,498
MO5	County		Snohomish	5/11/2000	Mountain Loop Hwy	Unnamed	Barrier	Unknown	Drop	4,384
HC93	State		Skagit	4/6/2011	SR 9	Unnamed	Barrier	0%	Slope	4,259
992698	Private	Private	Skagit	2/7/2018	private	Maddox Creek / Big Ditch	Barrier	Unknown	Depth	4,173
CR142	County	Skagit County	Skagit	6/7/2018	Bulson Rd	Bulson Creek	Barrier	33%	Slope	3,337
CR84	County		Snohomish	4/19/2016	Brandstrom Rd	Fisher Creek	Barrier	Unknown	Depth	2,884
SP10	Private	Private	Snohomish	1/1/1997		Everett Creek	Unknown	Unknown	Level B - Survey Needed	2,783
933794	County		Skagit	6/4/2016	Debays Isle Road	Debays Slough	Unknown	Unknown	Level B - Slough	2,721
931695	Private	Private	Skagit	3/3/2011		Careys Creek	Barrier	67%	Velocity	2,511
920330	Private	Private	Skagit	2/20/2013	Helen Dr	Unnamed	Unknown	Unknown	Level B - Survey Needed	2,456
HC63	Private	Private	Skagit	4/17/2012	Unnamed	Unnamed	Unknown	Unknown	Level B - Survey Needed	2,343
DC15	County		Snohomish	5/12/2000	N Sauk River Rd	Unnamed	Unknown	Unknown	Unknown	2,310
04.0434A 0.00	County		Skagit	6/13/2018	Dalles Rd	Lorenzan Creek	Barrier	67%	Drop	2,040
HC16	Private	Private	Skagit	12/9/2009		Unnamed	Barrier	67%	Slope	1,982
999792	Private	Private	Skagit	5/20/2008		Unnamed	Barrier	33%	Drop	1,960
NC10	Private	Private	Skagit	11/3/1999	Klahowya Rd	Klahowya Creek	Barrier	67%	Slope	1,909
HC41	County		Skagit	1/9/2018	footpath @ N. State	Dairy Creek	Unknown	Unknown	Level B - Survey Needed	1,893
PN5	Private	Private	Skagit	5/14/1999		Unnamed	Barrier	Unknown	Slope	1,887
JB38	County	Skagit County	Skagit	12/14/2018	South Cascade Rd	Clark Creek	Barrier	33%	Slope	1,884
1320286	Private	Private	Skagit	4/3/2014	BPA\Walker Valley Rd	Walker Creek East Fork	Barrier	67%	Drop	1,860
LC5	Federal		Snohomish	5/18/2000	FR 25 Rd	Swamp Creek	Barrier	67%	Slope	1,856
04.0675 0.54	County		Skagit	1/30/2018	Concrete-Sauk Valley Rd	Rudd Creek	Barrier	33%	Drop	1,844
GN35	Private	Private	Skagit	2/9/2020		Unnamed	Unknown	Unknown	Level B - Survey Needed	1,791
03.0182 1.85	County		Snohomish	3/28/2018		Milltown Creek	Barrier	67%	Velocity and Depth	1,738
AR8	County		Skagit	4/20/2016	Hamilton Cemetery Rd	Manser Creek	Barrier	33%	Slope	1,724
GN.SFEG1	Private	Private	Skagit	10/16/2017	NA - Private Farm road	Day Creek Slough	Barrier	Unknown	Judgement Call - See Notes	1,707
HC109	County		Skagit	4/4/2019	Duffy	Unnamed	Barrier	33%	Drop	1,647
RC4	County		Skagit	1/15/2018	Concrete Sauk Valley	Hobbit Creek	Barrier	0%	Drop and Slope	1,546
CR58	Private	Private	Skagit	12/17/2009	Clarence Lane	Unnamed	Barrier	67%	Slope	1,446
GN16	County	Skagit County	Skagit	3/17/2016	South Skagit Highway	Sorenson Creek	Barrier	0%	Drop and Slope	1,311
RC5	County		Skagit	2/7/2018	Concrete-Sauk Valley Rd	Osterman Creek	Barrier	0%	Drop and Slope	1,293
990608	County		Snohomish	3/4/1997	Pioneer Hwy	Unnamed	Barrier	0%	Velocity	1,281
GR22	City		Skagit	5/15/2018	Superior Ave	Lorenzan Creek	Barrier	33%	Slope	1,281
HC88	County	Skagit County	Skagit	12/13/2017	Pipeline Rd	Pipeline Creek	Barrier	0%	Drop and Slope	1,262
NC147	Private	Private	Skagit	3/17/1999	Otter Pond Rd	Unnamed	Barrier	33%	Drop	1,259
HC110	County	Skagit County	Skagit	6/7/2018	Hoehn Rd	Unnamed	Barrier	67%	Depth	1,174
GR18	County		Skagit	5/29/2018	Concrete Sauk Valley Rd	Lorenzan Creek	Barrier	33%	Velocity	1,162
CR100	Private	Private	Skagit	6/7/2018	Private drive off Little	Carpenter Creek	Barrier	33%	Drop	1,115
03.0196 0.10	County		Snohomish	4/19/2016	324th St NW	Unnamed	Barrier	33%	Depth	1,098
NC74	Private	Private	Skagit	3/15/2017	farm rd; SR 9	Gribble Creek	Barrier	67%	Depth	1,093
AR4	Private	Private	Skagit	4/20/2016	pvt; Hamilton Cemetary	Unnamed	Barrier	33%	Slope	1,080
HC44	Private	Private	Skagit	7/12/2000		Unnamed	Barrier	Unknown	Unknown	1,063
NC120	Private	Private	Skagit	1/8/2013		Kulshon Creek	Unknown	Unknown	Level B - Survey Needed	1,035
920332	Private	Private	Skagit	2/20/2013	Martha Dr	Unnamed	Barrier	67%	Slope	1,005
IL3	County		Skagit	11/20/2018	Rockport Cascade Rd	Unnamed	Barrier	67%	Slope	1,002
CR61	Private	Private	Skagit	6/8/1999	Bruun Rd	Unnamed	Barrier	Unknown	Slope	954
932312	Private	Private	Skagit	4/17/2012		Unnamed	Unknown	Unknown	Level B - Survey Needed	922
GN19	County		Skagit	1/9/2017	South Skagit Highway	Stevens Creek	Barrier	33%	Slope	889
HC45	Private	Private	Skagit	7/5/2000		Unnamed	Unknown	Unknown	Unknown	862
03.0183 1.20	County		Skagit	2/13/2019	Starbird Road	Unnamed	Barrier	0%	Drop and Slope	836
IL25	County	Skagit County	Skagit	5/24/2016	Martin Rd	Unnamed	Unknown	Unknown	Level B - Slough	827
999103	Private	Private	Snohomish	4/16/2008	private	Fisher Creek	Barrier	67%	Velocity	803
SP20	Private	Private	Skagit	5/12/2000	Prairie Rd	Prairie Creek	Barrier	Unknown	Slope	798
995382	Private	Private	Skagit	5/20/2003		Unnamed	Barrier	0%	Slope	796
CR66	County		Snohomish	6/8/1999	Countyline Rd	Unnamed	Barrier	Unknown	Unknown	776
HC103	Private	Private	Skagit	7/13/2000		Unnamed	Barrier	Unknown	Undersized	737
JB25	County		Skagit	11/29/2017	Rockport Cascade Rd	Clark Creek	Barrier	67%	Slope	734
DB2	Federal		Skagit	1/1/1901	FR1050	Unnamed	Barrier	Unknown	Slope	731
MO1	Private	Private	Snohomish	1/1/1997		Skull Creek	Barrier	Unknown	Slope	717
NC88	Private	Private	Skagit	3/11/2013	private	Trumpeter Creek	Unknown	Unknown	Level B - Survey Needed	717
CR197	Private	Private	Skagit	12/4/2000		Unnamed	Barrier	33%	Slope	702
03.0278 0.10	County		Skagit	6/12/2019	Hoehn Rd	Fender Creek	Barrier	0%	Slope	692
SF93	City		Skagit	10/17/2012	Fruitdale Rd	Brickyard Creek	Barrier	67%	Depth	673
SP18	Private	Private	Skagit	5/12/2000		Prairie Creek	Barrier	Unknown	Slope	663
IL9	County		Skagit	1/30/2018	Rockport Cascade Rd	Unnamed	Barrier	33%	Drop	659
HC46	County	Skagit County	Skagit	12/13/2017	Fruitdale Rd	Unnamed	Barrier	0%	Slope	626
CR188	County	Skagit County	Skagit	2/8/2018	Cascade Ridge Rd	Unnamed	Barrier	67%	Drop and Slope	622
NC75	Private	Private	Skagit	1/23/2001	private; Mt View Rd	Gribble Creek	Barrier	33%	Slope	614
SF92	Private	Private	Skagit	3/5/1999		Brickyard Creek	Unknown	Unknown	Unknown	611
930848	Private	Private	Skagit	12/16/2009		Unnamed	Barrier	67%	Drop	596
991913	Private	Private	Skagit	1/6/1999	private; English Rd	Unnamed	Barrier	0%	Drop	596
930829	Private	Private	Skagit	12/8/2009		Unnamed	Barrier	33%	Slope	585
JK5	Private	Private	Skagit	3/16/2011	driveway	Unnamed	Barrier	0%	Slope	584
NC217	Private	Private	Skagit	11/28/2000		Gribble Creek	Barrier	67%	Slope	580
SF107	Private	Private	Skagit	3/23/1999		Willard Creek	Barrier	Unknown	Drop	547
HC91	County		Skagit	4/6/2011	Fruitdale Rd	Unnamed	Barrier	0%	Slope	536
SP19	Private	Private	Skaqit	5/12/2000		Prairie Creek	Barrier	Unknown	Slope	529

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IL10	County		Skagit	1/22/2019	Rockport Cascade Rd	Unnamed	Barrier	67%	Slope	517	
SF99	Private	Private	Skagit	3/5/1999		Brickyard Creek	Barrier	Unknown	Unknown	517	
04.0659	0.31	County	Skagit	4/25/2018	Concrete Sauk Valley	Aldon Creek	Barrier	33%	Drop	487	
IL.SRSC1	County		Skagit	1/30/2018	Rockport Cascade Rd.	Unnamed	Barrier	67%	Slope	485	
930950	Private	Private	Skagit	1/4/2010		Unnamed	Barrier	33%	Other	482	
991915	Private	Private	Skagit	1/6/1999	private; English Rd	Unnamed	Barrier	0%	Slope	477	
HC.SRSC1	County		Skagit	1/24/2019	Fruitdale Road	Unnamed	Barrier	33%	Drop and Slope	473	
SP8	Private	Private	Snohomish	5/29/2018	Private Road	Everett Lake	Barrier	33%	Velocity	449	
03.0183	0.10	County	Skagit	12/17/2009	Franklin Rd	Unnamed	Barrier	33%	Drop	437	
SP16	County		Snohomish	8/28/2007	Sauk Prairie Rd	Dutch Creek	Unknown	Unknown	Level B - Survey Needed	437	
RC7	State		Skagit	1/1/1997	Old Concrete-Sauk	Flume Creek	Unknown	Unknown	Level B - Survey Needed	436	
GN8	Private	Private	Skagit	4/22/1999		Unnamed	Unknown	Unknown	Unknown	422	
SP1	County	Skagit County	Skagit	1/30/2018	E Sauk Prarie Rd	Prairie Creek	Barrier	0%	Drop and Slope	406	
TC7	Federal		Skagit	5/18/2000	FR 26	Unnamed	Barrier	Unknown	Slope	376	
CR60	County		Skagit	1/25/2018	Pacific Highway	Unnamed	Barrier	33%	Slope	363	
NC41	Private	Private	Skagit	1/10/2000		Cold Springs Creek	Barrier	33%	Slope	360	
920345	Private	Private	Skagit	3/7/2013		Trumpeter Creek	Barrier	0%	Slope	358	
HC65	Private	Private	Skagit	4/17/2012		Unnamed	Unknown	Unknown	Level B - Survey Needed	347	
DC5	Private	Private	Snohomish	1/1/1997		Mouse Creek	Unknown	Unknown	Unknown	346	
CR128	Private	Private	Skagit	11/8/2016	Little Mountain Road	Carpenter Creek	Barrier	33%	Velocity	340	
HC108	County		Skagit	4/4/2019	Duffy	Unnamed	Barrier	33%	Drop	329	
CR56	County		Skagit	4/4/2019	Franklin Rd	Unnamed	Barrier	0%	Slope	328	
HC53	State		Skagit	3/16/2003	SR 9	Unnamed	Barrier	33%	Slope	327	
930824	Private	Private	Skagit	11/2/2009		Unnamed	Barrier	33%	Drop	313	
1320271	Private	Private	Skagit	8/21/2013	Private	English Creek	Barrier	0%	Slope	312	
03.0183	0.70	County	Skagit	1/25/2018	Bonnieview Lane	Unnamed	Barrier	33%	Velocity and Depth	311	
NC137	City		Skagit	1/16/2013	Alison Ave	Logan Creek	Barrier	33%	Slope	309	
920331	Private	Private	Skagit	2/20/2013	Juanita Pl	Unnamed	Barrier	33%	Depth	301	
CR141	Private	Private	Skagit	8/21/2013	Private;Little Mt Rd	English Creek	Barrier	67%	Drop	301	
931697	Private	Private	Skagit	3/10/2011		Unnamed	Barrier	67%	Slope	298	
CD5	County		Skagit	12/9/2010	Sauk City Rd	Unnamed	Barrier	0%	Drop	293	
FC14	County		Skagit	1/31/2018	Cedar Grove Rd	Unnamed	Unknown	Unknown	Level B - Slough	289	
SP21	County		Skagit	5/12/2000	E. Sauk Prairie Road	Unnamed	Barrier	Unknown	Slope	289	
992697	Private	Private	Skagit	5/14/2019	farm access rd	Maddox Creek / Big Ditch	Barrier	67%	Slope	287	
JB22	County		Skagit	8/23/2016	Cascade Ridge Rd	Unnamed	Barrier	67%	Velocity and Depth	286	
HC58	Private	Private	Skagit	12/16/2009	Cordy Ln	Unnamed	Barrier	33%	Slope	284	
SP17	Private	Private	Snohomish	1/1/1997		Unnamed	Unknown	Unknown	Unknown	284	
TC4	Federal		Snohomish	5/18/2000	FR 26 Rd	Doe Creek	Barrier	67%	Slope	284	
982757	Private	Private	Skagit	10/2/2008		Unnamed	Barrier	0%	Other	277	
NC70	Private	Private	Skagit	1/23/2001	Cultus Ct	Gribble Creek	Barrier	67%	Slope	274	
HC64	Private	Private	Skagit	4/17/2012		Unnamed	Unknown	Unknown	Level B - Survey Needed	268	
HC87	County	Skagit County	Skagit	12/13/2017	Pipeline Rd	Pipeline Creek	Barrier	33%	Slope	261	
SF108	Private	Private	Skagit	12/22/2000		Unnamed	Barrier	67%	Slope	258	
HC.SKCO5	County		Skagit	11/19/2019	Cokedale Ln	Dairy Creek	Barrier	0%	Drop and Slope	256	
SP30	County		Snohomish	11/13/2000	Crawford Loop Rd	Wakon Creek	Unknown	Unknown	Unknown	256	
999772	Private	Private	Skagit	5/20/2008		Unnamed	Barrier	67%	Slope	245	
CR77	County		Skagit	4/19/2016	Bulson Rd	Starbird Creek	Barrier	33%	Other	244	
HC94	Private	Private	Skagit	12/9/2009	Parker Rd	Unnamed	Barrier	0%	Drop	244	
933580	County	County	Skagit	12/21/2018	Cedardale Road	Unnamed	Barrier	33%	Depth	238	
GR17	County		Skagit	6/12/2018	Concrete Rd	Lorenzan Creek	Barrier	67%	Velocity	230	
CC11	County		Snohomish	2/6/2001	Clear Creek Rd	Unnamed	Barrier	0%	Drop	228	
GR23	State		Skagit	5/15/2018	SR 20	Lorenzan Creek	Barrier	0%	Slope	227	
DM2	City	Whatcom	Skagit	5/25/2000		Babcock Creek	Unknown	Unknown	Level B - Survey Needed	226	
930830	Private	Private	Skagit	11/2/2009		Unnamed	Barrier	0%	Undersized	217	
HC52	County		Skagit	1/24/2019	Fruitdale Rd	Unnamed	Barrier	0%	Slope	212	
03.0399A	0.10	Private	Private	Skagit	2/2/1997	abandoned	Unnamed	Barrier	0%	Velocity	211
IL.SRSC2	Private	Private	Skagit	7/11/2019		Unnamed	Barrier	33%	Slope	210	
03.0280	0.00	County	Skagit	2/10/1997	Utopia Rd	Wiseman Creek	Barrier	0%	Tidegate	204	
933581	Private	Private	Skagit	11/3/2015	unnamed	Unnamed	Unknown	Unknown	Level B - Survey Needed	200	
CD4	County		Skagit	6/5/2013	Sauk City Rd	Unnamed	Barrier	33%	Slope	199	
HC62	County		Skagit	1/10/2018	Minkler Rd	Little Coal Creek	Unknown	Unknown	Level B - Survey Needed	198	
JB31	County		Skagit	11/15/2017	Fish Hatchery Ln	Hatchery Creek	Barrier	Unknown	Undersized	196	
930870	Private	Private	Skagit	12/16/2009		Unnamed	Barrier	67%	Drop	195	
991914	Private	Private	Skagit	1/6/1999	private; English Rd	Unnamed	Barrier	0%	Drop	190	
CR88	Private	Private	Snohomish	5/14/2008		Unnamed	Barrier	33%	Slope	182	
995338	Private	Private	Skagit	11/2/2009	East Conway Hill Lane	Unnamed	Barrier	0%	Slope	175	
JB34	County		Skagit	11/29/2017	Clark Rd	Clark Creek	Barrier	67%	Velocity	174	
MB8	Federal	US Forest	Whatcom	12/17/2019		Little Park Creek	Barrier	33%	Slope	173	
DB3	Private	Private	Skagit	7/14/2016	Dexter Ln	Unnamed	Barrier	33%	Slope	169	
SF110	Private	Private	Skagit	12/27/2000	access rd; Fruitdale Rd		Barrier	67%	Drop	158	
DC14	County		Snohomish	5/12/2000	N Sauk River Rd	Unnamed	Barrier	Unknown	Slope	155	
995341	Private	Private	Skagit	5/8/2003		Unnamed	Barrier	67%	Depth	153	
HC49	Private	Private	Skagit	12/13/2017	Access trail to		Barrier	0%	Slope	141	
HC59	Private	Private	Skagit	12/16/2009		Unnamed	Barrier	67%	Depth	141	
GR44	County		Skagit	9/29/2010	Challenger Rd	Ebing Creek	Barrier	0%	Drop	140	
CR140	Private	Private	Skagit	6/7/2018	Private - farm access	English Creek	Barrier	33%	Velocity and Depth	136	
JB8	Private	Private	Skagit	8/10/2000		Unnamed	Unknown	Unknown	Unknown	135	
700217	Private	Private	Skagit	7/11/2018	Taylor Road (Private)	Unnamed	Barrier	0%	Drop	134	
CR76	County		Skagit	4/19/2016	Starbird Rd	Unnamed	Barrier	0%	Slope	134	
132101923	Private	Private	Skagit	10/29/2010	Private;Sauk Store Rd	Unnamed	Barrier	0%	Slope	130	
HC85	County		Skagit	1/3/2018	Pipeline Rd	Pipeline Creek	Barrier	67%	Velocity	130	
CR136	Private	Private	Skagit	12/4/2019	Ervine Lane	Carpenter Creek	Barrier	33%	Slope	120	
GR9	State		Skagit	10/27/2010	SR 20	Fish Creek	Barrier	33%	Velocity	117	
JB20	Private	Private	Skagit	7/14/2016	Cascade Ridge Rd	Unnamed	Barrier	67%	Velocity and Slope	115	
920341	Private	Private	Skagit	3/7/2013		Trumpeter Creek	Barrier	0%	Slope	112	
GR10	County		Skagit	10/30/2019	Cascade Trail	Fish Creek	Barrier	67%	Depth	112	
930823	Private	Private	Skagit	11/2/2009		Unnamed	Barrier	33%	Drop	111	
GR40	County		Skagit	3/9/2011	Challenger Rd	Unnamed	Barrier	0%	Slope	107	
LC4	Federal		Snohomish	5/18/2000	FR 25 Rd	Seed Orchard Creek	Barrier	Unknown	Slope	106	
999054	Private	Private	Skagit	4/10/2008	driveway	Unnamed	Barrier	33%	Slope	103	
931570	County		Skagit	10/26/2010	Cascade Trail	Eagle Creek	Barrier	0%	Drop	99	
03.0181	5.76	County	Snohomish	4/19/2016	English Grade Rd	Fisher Creek	Barrier	33%	Drop	97	
930832	Private	Private	Skagit	12/8/2009		Unnamed	Barrier	33%	Undersized	96	
995416	Private	Private	Skagit	12/16/2009		Unnamed	Barrier	67%	Slope	84	
CR67	County		Skagit	4/4/2019	Haugen	Unnamed	Barrier	33%	Drop and Slope	82	
HC66	Private	Private	Skagit	4/17/2012		Unnamed	Unknown	Unknown	Level B - Survey Needed	79	
931899	Private	Private	Skagit	4/6/2011		Unnamed	Barrier	67%	Slope	78	
GR39	Private	Private	Skagit	3/9/2011	Piscatore Ln	Unnamed	Barrier	33%	Undersized	78	
930935	Private	Private	Skagit	12/16/2009		Unnamed	Barrier	33%	Slope	77	
NC202	Private	Private	Skagit	6/8/2000		Unnamed	Unknown	Unknown	Unknown	76	
994219	Private	Private	Skagit	12/9/2010	private	Unnamed	Barrier	33%	Undersized	73	
920343	Private	Private	Skagit	3/7/2013		Trumpeter Creek	Barrier	0%	Slope	72	
995340	Private	Private	Skagit	5/8/2003		Unnamed	Barrier	67%	Slope	72	
SP24	City		Skagit	5/12/2000	forest rd	Unnamed	Unknown	Unknown	Unknown	70	
HC92	County		Skagit	4/6/2011	Mosier Rd	Unnamed	Barrier	0%	Slope	66	
930827	Private	Private	Skagit	12/8/2009		Unnamed	Barrier	33%	Slope	65	
GN4	Private	Private	Skagit	4/22/1999		Unnamed	Unknown	Unknown	Unknown	59	
920342	Private	Private	Skagit	3/7/2013		Trumpeter Creek	Barrier	0%	Slope	58	
931571	Private	Private	Skagit	10/26/2010		Eagle Creek	Barrier	0%	Drop	56	
999104	Private	Private	Snohomish	4/16/2008		Fisher Creek	Barrier	33%	Slope	54	
DC8	Private	Private	Snohomish	1/1/1997		Unnamed	Barrier	Unknown	Unknown	54	
HC47	Private	Private	Skagit	7/6/2000		Unnamed	Barrier	Unknown	Drop	52	
JB16	Private	Private	Skagit	8/10/2000		Boulder Creek	Barrier	Unknown	Unknown	50	
GN14	Private	Private	Skagit	4/22/1999		Unnamed	Barrier	Unknown	Debris	47	
JK3	Private	Private	Skagit	3/16/2011	driveway	Unnamed	Barrier	67%	Slope	46	
995383	Private	Private	Skagit	5/20/2003	field access rd	Unnamed	Barrier	0%	Slope	45	
920300	Private	Private	Skagit	1/24/2013		Martha Washington	Unknown	Unknown	Insufficient Data	43	
931699	Private	Private	Skagit	3/17/2011	private	Unnamed	Barrier	33%	Slope	43	
931696	Private	Private	Skagit	3/10/2011		Unnamed	Barrier	0%	Slope	41	
995337	Private	Private	Skagit	5/7/2003	East Conway Hill Lane	Unnamed	Barrier	33%	Slope	37	
930822	Private	Private	Skagit	12/12/2009		Unnamed	Barrier	0%	Slope	34	
CD2	Private	Private	Skagit	1/1/1901		Unnamed	Unknown	Unknown	Unknown	34	

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HC90	County	Skagit County	Skagit	12/13/2017	Pipeline Rd	Unnamed	Barrier	33%	Drop and Slope	34
JB35	County		Skagit	1/31/2018	Clark Rd	Clark Creek	Barrier	67%	Drop	34
JB5	Private	Private	Skagit	8/10/2000	E Cascade Dr	Day Creek	Barrier	Unknown	Drop	34
SF96	State		Skagit	3/5/1999		Brickyard Creek	Barrier	Unknown	Drop	34
931896	Private	Private	Skagit	4/6/2011			Barrier	33%	Other	32
HC55	Private	Private	Skagit	12/16/2009			Barrier	33%	Slope	32
HC54	Private	Private	Skagit	12/16/2009			Barrier	33%	Slope	31
NC212	Private	Private	Skagit	2/21/2008		Norway Park Creek	Barrier	67%	Slope	31
JK4	Private	Private	Skagit	3/16/2011	driveway		Barrier	67%	Slope	28
NC213	Private	Private	Skagit	5/22/2018	Pavilion Drive	Norway Park Creek	Barrier	0%	Drop and Slope	28
930826	Private	Private	Skagit	12/8/2009			Barrier	0%	Slope	27
GN3	County		Skagit	4/4/2019	Potts Rd		Barrier	67%	Slope	27
995440	County		Skagit	2/13/2019	Cascade Trail		Barrier	33%	Slope	26
GR55	Private	Private	Skagit	9/29/2010	Unnamed	Ebing Creek	Barrier	0%	Drop	23
930934	Private	Private	Skagit	12/16/2009			Barrier	0%	Slope	20
HC60	County		Skagit	12/16/2009	Mosier Rd		Barrier	67%	Velocity	19
930828	Private	Private	Skagit	12/8/2009			Barrier	33%	Drop	17
SF98	County		Skagit	3/5/1999	Fruitdale Rd	Brickyard Creek	Barrier	Unknown	Unknown	17
HC57	Private	Private	Skagit	12/16/2009			Barrier	67%	Slope	16
HC48	Private	Private	Skagit	7/6/2000			Barrier	Unknown	Unknown	14
SF97	Private	Private	Skagit	3/5/1999		Brickyard Creek	Barrier	Unknown	Unknown	14
991924	Private	Private	Skagit	1/13/1999	logging rd; English Rd		Barrier	0%	Drop	13
920302	Private	Private	Skagit	1/24/2013		Martha Washington	Barrier	33%	Slope	12
03.0266 0.00	Private	Private	Skagit	10/16/2012		Brickyard Creek	Barrier	67%	Drop	11
HC72	County	Skagit County	Skagit	12/6/2017	Lyman-Hamilton Rd		Barrier	67%	Slope	5
HC51	Private	Private	Skagit	12/16/2009			Barrier	0%	Drop	1

Table 8: Field-Based Habitat Assessments

Our project team completed 36 habitat assessments. Including data from all sources, 152 habitat surveys with PI are available for barrier culverts in our study area.

Individual Details for Culverts (n = 152). PI = Priority Index, per WDFW 2019.

Site ID	Site Owner Type	Road Name	Stream Name	Barrier Status	% Passability	Barrier Reason	Spawning Area M ²	Rearing Area M ²	Lineal Gain M	PI
CR26	County	Cascade Ridge Rd	Carpenter Creek	Barrier	33%	Velocity	7,046	27,286	4,516	50.84
CR28	City	E Hickox Rd	Carpenter Creek	Barrier	33%	Drop	7,046	25,925	4,096	50.43
CR100	Private	Private drive off Little Mountain	Carpenter Creek	Barrier	33%	Drop	1,593	15,083	1,868	43.94
CR128	Private	Little Mountain Road	Carpenter Creek	Barrier	33%	Velocity	1,544	14,886	1,606	43.94
GN18	County	S Skagit Hwy	Gilligan Creek	Barrier	33%	Slope	1,315	85,265	1,145	38.54
AR9	County	Hamilton Cemetery Rd	Red Cabin Creek	Barrier	33%	Velocity	4,615	7,772	5,327	34.57
991146	State	SR 20	Childs Creek	Barrier	67%	Velocity	3,106	5,728	2,380	34.3
CR136	Private	Ervine Lane	Carpenter Creek	Barrier	33%	Slope	254	13,908	902	33.23
IL9	County	Rockport Cascade Rd	Unnamed	Barrier	33%	Drop	330	30,948	1,240	32.62
CR143	Drainage District		Maddox Creek / Big Ditch	Barrier	0%	Tidegate	2,865	40,360	21,901	31.98
CR70	Drainage District		Maddox Creek / Big Ditch	Barrier	0%	Tidegate	2,865	40,360	21,901	31.98
GN16	County	South Skagit Highway	Sorenson Creek	Barrier	0%	Drop and Slope	1,094	2,310	859	31.13
CR140	Private	Private - farm access	English Creek	Barrier	33%	Velocity and Depth	2,987	1,413	681	29.7
AR8	County	Hamilton Cemetery Rd	Mannser Creek	Barrier	33%	Slope	4,317	5,544	2,613	28.84
IL10	County	Rockport Cascade Rd	Unnamed	Barrier	67%	Slope	385	36,920	1,121	28.46
GR54	State	SR 20	Eagle Creek	Barrier	33%	Velocity	1,255	8,024	2,270	26.65
JB25	County	Rockport Cascade Rd	Clark Creek	Barrier	67%	Slope	146	6,080	1,099	26.57
CR141	Private	Private; Little Mt Rd	English Creek	Barrier	67%	Drop	1,956	828	326	26.42
931695	Private		Careys Creek	Barrier	67%	Velocity	62	200	214	26.18
GN19	County	South Skagit Highway	Stevens Creek	Barrier	33%	Slope	1,220	587	1,008	25.68
AR25	City	1st St	Careys Creek	Barrier	67%	Velocity	47	33,040	1,585	25.52
AR39	City	Pettit Rd	Careys Slough	Unknown	Unknown	Level B - Slough				25.52
IL12	County	Martin Ranch Rd	Unnamed	Barrier	67%	Drop and Slope	3,313	577	1,467	24.02
CR196	Private		Starbird Creek	Barrier	33%	Velocity	1,663	16,203	9,981	23.95
AR26	Private		Careys Creek	Barrier	67%	Velocity	0	32,027	1,288	23.65
CC2	County	Mountain Loop Hwy	Goodman Creek	Barrier	0%	Drop	1,420	3,006	423	23.37
NC75	Private	private; Mt View Rd	Gribble Creek	Barrier	33%	Slope	686	15,175	2,201	23.07
999104	Private		Fisher Creek	Barrier	33%	Slope	1,761	12,775	8,495	22.64
NC211	Private		Unnamed	Barrier	0%	Slope	1,587	9,294	3,408	22.41
RC4	County	Concrete Sauk Valley Rd.	Hobbit Creek	Barrier	0%	Drop and Slope	884	843	1,076	22.04
JB38	County	South Cascade Rd	Clark Creek	Barrier	33%	Slope	795	691	347	21.59
RC5	County	Concrete-Sauk Valley Rd	Osterman Creek	Barrier	0%	Drop and Slope	229	413	859	21.24
600050	Federal	forest road; SR 20	Unnamed	Barrier	0%	Slope	239	986	297	20.72
NC217	Private		Gribble Creek	Barrier	67%	Slope	1,803	19,009	4,481	20.29
NC70	Private	Cultus Ct	Gribble Creek	Barrier	67%	Slope	1,635	17,278	3,687	19.96
991150	State	SR 20	Eagle Creek	Barrier	67%	Velocity	970	4,526	1,946	19.78
CR77	County	Bulson Rd	Starbird Creek	Barrier	33%	Other	1,990	19,970	11,598	19.06
NC136	County	Mountain View Rd	Unnamed	Barrier	67%	Velocity	278	14,114	1,628	18.98
NC129	State	SR 538	Logan Creek	Barrier	33%	Slope	1,579	3,973	2,587	17.96
HC91	County	Fruitdale Rd	Unnamed	Barrier	0%	Slope	90	3,690	1,328	17.86
CD4	County	Sauk City Rd	Unnamed	Barrier	33%	Slope	2,954	6,474	4,671	17.76
992698	Private	private	Maddox Creek / Big Ditch	Barrier	Unknown	Depth	4,713	21,310	11,487	17.48
HC92	County	Mosier Rd	Unnamed	Barrier	0%	Slope	10	3,370	623	17.46
JB34	County	Clark Rd	Clark Creek	Barrier	67%	Velocity	37	951	164	17.31
931896	Private		Unnamed	Barrier	33%	Other	0	3,197	434	17.26
NC138	City	30th St	Logan Creek	Barrier	33%	Slope	1,149	3,301	1,871	16.92
NC213	Private	Pavilion Drive	Norway Park Creek	Barrier	0%	Drop and Slope	733	2,091	1,741	15.89
IL11	County	Martin Ranch Rd	Unnamed	Barrier	67%	Drop and Slope	0	6,180	479	15.68
HC94	Private	Parker Rd	Unnamed	Barrier	0%	Drop	1,952	3,181	1,613	15.59
JB31	County	Fish Hatchery Ln	Hatchery Creek	Barrier	Unknown	Undersized	3	1,222	226	15.22
CR88	Private		Unnamed	Barrier	33%	Slope	178	2,622	2,722	15.16
930822	Private		Unnamed	Barrier	0%	Slope	327	1,325	1,890	15.06
991725	State	I-5	Maddox Creek / Big Ditch	Barrier	67%	Depth	4,742	21,317	11,487	14.65
HC93	State	SR 9	Unnamed	Barrier	0%	Slope	6	3,309	551	14.62
CD18	State	SR 20	Olson Creek	Barrier	0%	Slope	1,261	2,728	2,423	14.35
990641	State	SR 9	Unnamed	Barrier	67%	Slope	121	4,603	2,479	14.29
999388	Private		Unnamed	Barrier	67%	Undersized	0	3,937	1,158	14.17
930826	Private		Unnamed	Barrier	0%	Slope	86	1,017	1,270	14.09
991913	Private	private; English Rd	Unnamed	Barrier	0%	Drop	758	1,428	1,594	14.09
995335	Other		Unnamed	Barrier	0%	Slope	329	1,374	2,005	13.73
NC137	City	Alison Ave	Logan Creek	Barrier	33%	Slope	584	1,289	773	13.73
CR188	County	Cascade Ridge Rd	Unnamed	Barrier	67%	Drop and Slope	85	262	225	13.68
995338	Private	East Conway Hill Lane	Unnamed	Barrier	0%	Slope	325	1,294	1,828	13.52
NC212	Private		Norway Park Creek	Barrier	67%	Slope	748	2,139	1,779	13.38
930823	Private		Unnamed	Barrier	33%	Drop	276	1,197	1,699	13.28
930824	Private		Unnamed	Barrier	33%	Drop	209	1,153	1,571	13.16
JB22	County	Cascade Ridge Rd	Unnamed	Barrier	67%	Velocity and Depth	3	685	661	13.12
991151	State	SR 20	Eagle Creek	Barrier	0%	Slope	1,069	1,666	1,638	13.04
GR18	County	Concrete Sauk Valley Rd	Lorenzan Creek	Barrier	33%	Velocity	945	2,635	3,084	12.83
991914	Private	private; English Rd	Unnamed	Barrier	0%	Drop	423	949	1,100	12.73
CR3	County	Conway Hill Rd	Unnamed	Barrier	33%	Slope	340	1,482	2,408	12.66
930827	Private		Unnamed	Barrier	33%	Slope	61	982	1,377	12.63
GR22	City	Superior Ave	Lorenzan Creek	Barrier	33%	Slope				12.56
930829	Private		Unnamed	Barrier	33%	Slope	41	955	1,116	12.54
991915	Private	private; English Rd	Unnamed	Barrier	0%	Slope	350	878	1,036	12.48
03.0196 0.68	Private	Pleasant Hill Rd	Unnamed	Barrier	0%	Drop	75	772	880	12.44
995337	Private	East Conway Hill Lane	Unnamed	Barrier	33%	Slope	328	1,352	1,947	12.37
NC163	State	SR 9	Unnamed	Barrier	33%	Slope	295	1,255	684	12.24
990091	State	SR 9	Norway Park Creek	Barrier	0%	Slope	730	2,081	1,690	12.14
GR17	County	Concrete Rd	Lorenzan Creek	Barrier	67%	Velocity	945	2,699	3,084	12.13
HC52	County	Fruitdale Rd	Unnamed	Barrier	0%	Slope	262	1,528	1,726	12.05
931570	County	Cascade Trail	Eagle Creek	Barrier	0%	Drop	1,007	1,593	1,584	12.03
920732	City	Anderson Rd	Martha Washington Creek	Barrier	33%	Other	337	2,413	2,611	11.98
931571	Private		Eagle Creek	Barrier	0%	Drop	905	1,473	1,495	11.79
995265	State	SR 534	Unnamed	Barrier	0%	Drop	339	1,479	2,335	11.76
JK5	Private	driveway	Unnamed	Barrier	0%	Slope	288	682	1,200	11.76
HC58	Private	Cordy Ln	Unnamed	Barrier	33%	Slope	62	903	849	11.7
NC196	Private		Unnamed	Barrier	33%	Drop	0	600	53	11.7
GR55	Private	Unnamed	Ebing Creek	Barrier	0%	Drop	328	864	850	11.57
931355	City	Limestone St	Lorenzan Creek	Barrier	0%	Drop	783	1,068	1,010	11.56
GR44	County	Challenger Rd	Ebing Creek	Barrier	0%	Drop	318	833	788	11.42
GR9	State	SR 20	Fish Creek	Barrier	33%	Velocity	1,595	2,475	2,348	11.36
930828	Private		Unnamed	Barrier	33%	Drop	42	958	1,129	11.35
931354	City		Lorenzan Creek	Barrier	33%	Slope	835	1,168	1,317	11.23
GR23	State	SR 20	Lorenzan Creek	Barrier	0%	Slope	945	1,381	1,582	11.03
GR19	City	Fir St	Lorenzan Creek	Barrier	67%	Depth				10.94
GR20	City	S Park Ave	Lorenzan Creek	Barrier	67%	Depth				10.91
NC107	City	N35th St	Unnamed	Barrier	0%	Slope	83	499	931	10.9
930830	Private		Unnamed	Barrier	0%	Undersized	0	534	697	10.84
CD6	County	Sauk Store Rd	Unnamed	Barrier	0%	Drop	1,928	2,012	2,664	10.83
600051	Federal	forest road; SR 20	Unnamed	Barrier	67%	Slope	0	826	61	10.82
CR2	State	SR 534	Unnamed	Barrier	33%	Slope	345	1,533	2,508	10.72
930849	Private	Unnamed	Unnamed	Barrier	0%	Slope	1	470	406	10.69
04.0675 0.54	County	Concrete-Sauk Valley Rd	Rudd Creek	Barrier	33%	Drop	151	91	208	10.66
931579	City	Main St	Lorenzan Creek	Barrier	0%	Slope	859	1,215	1,342	10.62
930934	Private		Unnamed	Barrier	0%	Slope	0	443	307	10.53
995416	Private		Unnamed	Barrier	67%	Slope	152	1,191	1,421	10.5
RC6	County	Concrete-Sauk Valley Rd	Osterman Creek East	Barrier	33%	Drop and Slope	55	54	164	10.41
999054	Private	driveway	Unnamed	Barrier	33%	Slope	34	560	432	10.38
999792	Private		Unnamed	Barrier	33%	Drop	23	485	206	10.02
991142	State	SR 20	Unnamed	Barrier	67%	Slope	1,952	3,181	1,613	9.94
920340	Private		Unnamed	Barrier	0%	Debris	0	298	174	9.81
03.0196 0.10	County	324th St NW	Unnamed	Barrier	33%	Depth	219	1,402	1,830	9.77
931696	Private		Unnamed	Barrier	0%	Slope	216	337	576	9.6
HC53	State	SR 9	Unnamed	Barrier	33%	Slope	160	1,222	1,458	9.6
995340	Private		Unnamed	Barrier	67%	Slope	136	1,763	644	9.46
995341	Private		Unnamed	Barrier	67%	Depth	142	1,775	666	9.46
HC59	Private		Unnamed	Barrier	67%	Depth	8	688	608	9.16
JK2	State	SR 20	Unnamed	Barrier	0%	Slope	298	740	1,309	9.15
JK3	Private	driveway	Unnamed	Barrier	67%	Slope	298	736	1,294	9.11

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991451	State	SR 9	Unnamed	Barrier	0%	Slope	232	214	104	9.02
JK4	Private	driveway	Unnamed	Barrier	67%	Slope	291	701	1,234	8.99
HC57	Private		Unnamed	Barrier	67%	Slope	67	923	882	8.9
CR80	County	Starbird Rd	Unnamed	Barrier	0%	Drop	88	313	359	8.84
03.0181 5.76	County	English Grade Rd	Fisher Creek	Barrier	33%	Drop	532	8,863	6,580	8.81
CR122	State	I-5	Martha Washington Creek	Barrier	33%	Other	4	1,334	1,448	8.78
990410	State	SR 20	Sutter Creek	Barrier	0%	Slope	413	409	629	8.68
600049	Federal	forest road; SR 20	Unnamed	Barrier	67%	Depth	75	40	114	8.51
999107	Private		Fisher Creek	Barrier	33%	Undersized	4	245	164	8.37
999772	Private		Unnamed	Barrier	67%	Slope	4	482	613	8.37
994218	County	Sauk Store Rd	Unnamed	Barrier	0%	Drop and Slope	427	773	814	8.32
NC122	City	18th St	Kulshon Creek	Barrier	33%	Slope	187	348	380	8.32
CR124	City	Henson Rd	Martha Washington Creek	Barrier	33%	Slope	4	476	1,108	8.07
930870	Private		Unnamed	Barrier	67%	Drop	0	435	279	7.94
HC54	Private		Unnamed	Barrier	33%	Slope	44	185	398	7.87
920287	City	N 30th St	Unnamed	Barrier	0%	Slope	23	131	152	7.83
HC60	County	Mosier Rd	Unnamed	Barrier	67%	Velocity	1	473	416	7.53
03.2970 0.00	City	Blodgett Rd	Flowers Creek	Barrier	33%	Slope	322	464	504	7.41
HC55	Private		Unnamed	Barrier	33%	Slope	17	145	278	7.4
930832	Private		Unnamed	Barrier	33%	Undersized	0	115	179	7.38
GR40	County	Challenger Rd	Unnamed	Barrier	0%	Slope	282	529	622	7.37
931697	Private		Unnamed	Barrier	67%	Slope	186	296	506	6.98
930935	Private		Unnamed	Barrier	33%	Slope	1	122	259	6.91
930831	County	Bulson Rd	Unnamed	Barrier	33%	Slope	0	123	212	6.78
NC166	State	SR 9	Unnamed	Barrier	0%	Slope	160	377	585	6.75
930950	Private		Unnamed	Barrier	33%	Other	257	858	933	6.51
931699	Private	private	Unnamed	Barrier	33%	Slope	0	40	132	5.38
995242	State	I-5; NB Ext 218	Unnamed	Barrier	33%	Unknown	257	994	1,136	5.13
997396	State	SR 20	Unnamed	Barrier	67%	Velocity	339	612	715	4.46
920346	City	Shoshone Dr	Trumpeter Creek	Barrier	0%	Slope	20	36	138	3.68
JB35	County	Clark Rd	Clark Creek	Barrier	67%	Drop	0	5	201	3.15
982757	Private		Unnamed	Barrier	0%	Other	0	1	54	2.8

Table 9: Barrier Clusters and Culvert Orders

All Culverts (n = 443):

Crossing Order	> 10,000 M ²	1,000 to 10,000 M ²	200 to 1,000 M ²	0 to 100 M ²	0 M ²	No Habitat Estimate	Total
0	3	16	13	6	27	14	79
1	1	11	12	11	16	6	57
2 - 5	5	24	44	47	46	42	208
5 or more	4	6	18	25	22	12	87
Above Natural Barrier	1	3	3	1	4	0	12
Total	14	60	90	90	115	74	443

Skagit County Culverts (n = 100):

Crossing Order	> 10,000 M ²	1,000 to 10,000 M ²	200 to 1,000 M ²	0 to 100 M ²	0 M ²	No Habitat Estimate	Total
0	1	9	7	1	11	0	29
1	1	5	4	2	1	0	13
2 - 5	1	6	19	14	9	0	49
5 or more	2	0	0	2	4	0	8
Above Natural Barrier	0	1	0	0	0	0	1
Total	5	21	30	19	25	0	100

Snohomish County Culverts (n = 22):

Crossing Order	> 10,000 M ²	1,000 to 10,000 M ²	200 to 1,000 M ²	0 to 100 M ²	0 M ²	No Habitat Estimate	Total
0	0	1	1	1	2	0	5
1	0	1	1	0	0	0	2
2 - 5	0	0	1	0	5	0	6
5 or more	1	3	1	1	0	0	6
Above Natural Barrier	0	2	0	0	1	0	3
Total	1	7	4	2	8	0	22

Whatcom County Culverts (n = 0):

Crossing Order	> 10,000 M ²	1,000 to 10,000 M ²	200 to 1,000 M ²	0 to 100 M ²	0 M ²	No Habitat Estimate	Total
Total	0	0	0	0	0	0	0

Private Culverts (n = 204):

Crossing Order	> 10,000 M ²	1,000 to 10,000 M ²	200 to 1,000 M ²	0 to 100 M ²	0 M ²	No Habitat Estimate	Total
0	0	4	1	2	10	0	17
1	0	5	6	9	10	1	31
2 - 5	3	18	23	31	24	1	100
5 or more	1	1	14	21	11	0	48
Above Natural Barrier	1	0	3	1	3	0	8
Total	5	28	47	64	58	2	204

Other Public Culverts (n = 117):

Crossing Order	> 10,000 M ²	1,000 to 10,000 M ²	200 to 1,000 M ²	0 to 100 M ²	0 M ²	No Habitat Estimate	Total
0	2	2	4	2	4	14	28
1	0	0	1	0	5	5	11
2 - 5	1	0	1	2	8	41	53
5 or more	0	2	3	1	7	12	25
Total	3	4	9	5	24	72	117

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Individual Details for Culverts (n = 431). Note: The 12 sites above natural barriers are not included in table below.

Site ID	Barrier Cluster	Crossing Order	GIS Habitat Area M ²	Owner Type	Owner Name	Fill Depth	Culvert Length	Channel Width	Road Name	Stream Name	Barrier Status	% Passability	Upstream Barrier Count	Steelhead Presence
LC6	LCSC1	0	30190	Federal			12.5	2	FR 2540 Rd	Swamp Creek	Unknown	Unknown	0	Unknown
AR9	ARRC1	0	19654	County	Skagit County	3.23	15.5	10.1	Hamilton Cemetary Rd	Red Cabin Creek	Barrier	33%	0	Yes
CD18	CDOC1	0	15179	State		2	21	3.91	SR 20	Olson Creek	Barrier	0%	0	Unknown
NC163	WFNC13	0	6162	State		1	12	1.2	SR 9	Unnamed	Barrier	33%	0	Unknown
GN18	GNGC1	0	4729	County		11.12	50	17	S Skagit Hwy	Gilligan Creek	Barrier	33%	0	Yes
CR142	CRHD2	0	3337	County	Skagit County	2.03	11.7	4.9	Bulson Rd	Bulson Creek	Barrier	33%	0	Yes
933794	NCDS1	0	2721	County		3	15	80	Debays Isle Road	Debays Slough	Unknown	Unknown	0	Yes
DC15	DCUS2	0	2310	County			13	4	N Sauk River Rd	Unnamed	Unknown	Unknown	0	Unknown
PN5	PNUS1	0	1887	Private	Private		12	1.9		Unnamed	Barrier	Unknown	0	Yes
LC5	LCUS2	0	1856	Federal			15.2	3	FR 25 Rd	Swamp Creek	Barrier	67%	0	Unknown
04.0675 0.54	RCRU1	0	1844	County		9.84	40	4.7	Concrete-Sauk Valley Rd	Rudd Creek	Barrier	33%	0	Yes
HC109	HCSS3	0	1647	County			19		Duffy	Unnamed	Barrier	33%	0	No
RC4	RCHC1	0	1546	County		5.63	18.1	5	Concrete Sauk Valley Rd.	Hobbit Creek	Barrier	0%	0	Yes
GN16	GNSC1	0	1311	County	Skagit County	7.49	28.3	9.8	South Skagit Highway	Sorenson Creek	Barrier	0%	0	Yes
RC5	RCOC1	0	1293	County		2.64	14	3.4	Concrete-Sauk Valley Rd	Osterman Creek	Barrier	0%	0	Yes
NC147	WFNC1	0	1259	Private	Private		15.2	1	Otter Pond Rd	Unnamed	Barrier	33%	0	Yes
HC110	HCSS2	0	1174	County	Skagit County	4.33	17	7	Hoehn Rd	Unnamed	Barrier	67%	0	Yes
AR4	ARMC1	0	1080	Private	Private	1	8.3	2.9	pvt; Hamilton Cemetary Rd	Unnamed	Barrier	33%	0	Yes
HC44	HC2	0	1063	Private	Private		9.2	1.3		Unnamed	Barrier	Unknown	0	Yes
GN19	GNSV1	0	889	County		2.73	18	2.9	South Skagit Highway	Stevens Creek	Barrier	33%	0	Yes
MO1	MOSK1	0	717	Private	Private		6	3		Skull Creek	Barrier	Unknown	0	Yes
03.0278 0.10	HCSS1	0	692	County		6.7	37.13	3	Hoehn Rd	Fender Creek	Barrier	0%	0	No
CR188	CR1	0	622	County	Skagit County	2.28	12.5	1.1	Cascade Ridge Rd	Unnamed	Barrier	67%	0	Yes
04.0659 0.31	CDAC1	0	487	County		7.69	35.05	4.1	Concrete Sauk Valley	Aldon Creek	Barrier	33%	0	Yes
RC7	RCFC1	0	436	State			17.5	3.5	Old Concrete-Sauk Valley	Flume Creek	Unknown	Unknown	0	Unknown
TC7	TCUS1	0	376	Federal			15.4	4	FR 26	Unnamed	Barrier	Unknown	0	Unknown
CR56	CRFC3	0	328	County		4.74	17.5	1.4	Franklin Rd	Unnamed	Barrier	0%	0	No
FC14	FCUS2	0	289	County		5.12	24		Cedar Grove Rd	Unnamed	Unknown	Unknown	0	Yes
TC4	LCUS3	0	284	Federal			19	2	FR 26 Rd	Doe Creek	Barrier	67%	0	Unknown
CC11	CCUS2	0	228	County		0.5	9.9	0.8	Clear Creek Rd	Unnamed	Barrier	0%	0	Yes
DM2	DMUS2	0	226	City			11	2		Babcock Creek	Unknown	Unknown	0	Unknown
03.0280 0.00	HCWC1	0	204	County					Utopia Rd	Wiseman Creek	Barrier	0%	0	Yes
CD4	CDUS9	0	199	County		2.85	12.5	5.7	Sauk City Rd	Unnamed	Barrier	33%	0	Yes
DC14	DCUS1	0	155	County			16	2	N Sauk River Rd	Unnamed	Barrier	Unknown	0	Yes
LC4	LCUS1	0	106	Federal			14.8	1.6	FR 25 Rd	Seed Orchard Creek	Barrier	Unknown	0	Unknown
NC202	WFNC2	0	76	Private	Private		6	0.4		Unnamed	Unknown	Unknown	0	No
SP24	SPUS1	0	70	City					forest rd	Unnamed	Unknown	Unknown	0	Unknown
JB16	JBUS3	0	50	Private	Private		6	5.3		Boulder Creek	Barrier	Unknown	0	Yes
04.0644 0.20	FCUS1	0	0	County		4.53	24.3		Concrete Sauk	Unnamed	Barrier	0%	0	No
CC10	CCUS1	0	0	County		2	31.5	2	Mountain Loop Hwy	Unnamed	Barrier	67%	0	Yes
CC2	CCGC1	0	0	County		5	33.6	8.6	Mountain Loop Hwy	Goodman Creek	Barrier	0%	0	Unknown
CD11	CDUS12	0	0	County			20	1.5		Unnamed	Unknown	Unknown	0	Unknown
CD6	CDUS7	0	0	County		2	14.1	6.3	Sauk Store Rd	Unnamed	Barrier	0%	0	No
DC11	DCTK1	0	0	Federal			14	4.5		Tiny Kisutch Creek	Barrier	Unknown	0	Unknown
FC8	FCUS4	0	0	Private	Private		9.7	1	CP 1400 Rd	Unnamed	Barrier	Unknown	0	No
IL2	ILMS1	0	0	Private	Private		7.4	6		Marblegate Slough	Barrier	Unknown	0	Yes
JB11	JBUS5	0	0	Private	Private		8	2.5	E Cascade Dr	Unnamed	Barrier	Unknown	0	Yes
JB12	JBUS6	0	0	Private	Private		9.9	3.8	E Cascade Dr	Unnamed	Barrier	Unknown	0	Yes
JB13	JBUS4	0	0	Private	Private		7.6	1.3	Marblemount Way	Unnamed	Barrier	Unknown	0	No
JB28	JBUS9	0	0	County		2.56	27.9	2.1	Rockport Cascade Rd	Unnamed	Barrier	0%	0	No
JB29	JBUS1	0	0	County		2.89	18.2	1.4	Rockport Cascade Rd	Unnamed	Barrier	33%	1	No
LA11	LAUS1	0	0	County		5.31	20	1.75	South Skagit Hwy	Unnamed	Barrier	0%	0	Yes
LA2	LAUS2	0	0	County			13	2.3	S Skagit Hwy	Unnamed	Barrier	Unknown	0	Yes
LA5	LANP1	0	0	County		2.71	18.6	1.85	South Skagit Highway	Nettles Pond	Barrier	67%	0	No
NC141	NC1	0	0	Private	Private		6	6		Unnamed	Barrier	33%	0	Yes
NC148	WFNC6	0	0	Private	Private		12.2	1	Otter Pond Rd	Unnamed	Barrier	33%	0	No

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NC193	WFNC7	0	0	Private	Private		12	1	Triple Creek Ln	Unnamed	Barrier	Unknown	0	No
NC196	WFNC10	0	0	Private	Private	1	6.2	0.7		Unnamed	Barrier	33%	0	Yes
NC211	WFNC9	0	0	Private	Private	1	7.7	1.9		Unnamed	Barrier	0%	0	Yes
NC50	EFNC1	0	0	County		0.87	11	0.9	Fox Rd	Unnamed	Barrier	33%	0	No
RC6	RCOE1	0	0	County		2.55	14	5.3	Concrete-Sauk Valley Rd	Osterman Creek East	Barrier	33%	0	Yes
SP.SKCO1	SPDP1	0	0	County		2.58	14	1.8	Dearinger Park Rd.	Unnamed	Barrier	67%	0	No
TC1	LCUS5	0	0	Federal			13	1.5	FR 26 Rd	Unnamed	Barrier	Unknown	0	Unknown
TC2	LCUS4	0	0	Federal			11.5	1	FR 26 Rd	Unnamed	Barrier	67%	0	Unknown
TC5	TCUS2	0	0	Federal			13	3	FR 26 Rd	Unnamed	Barrier	Unknown	0	Unknown
600052	DMUS3	0		Federal		5	12.4	3.42	forest road; SR 20	Unnamed	Unknown	Unknown	0	Unknown
920305	PAJL1	0		City		3	33.7	3.6	N Hill Blvd	Unnamed	Barrier	67%	0	Unknown
990410	CDSC1	0		State		3	24.1	4	SR 20	Sutter Creek	Barrier	0%	0	Unknown
990885	ILUS1	0		State		3	19.2	26.5	SR 530	Unnamed	Barrier	Unknown	0	Unknown
991133	CRBD1	0		State		2	81.6	2.7	I-5	Unnamed	Unknown	Unknown	0	Unknown
991146	HCCC1	0		State		2	14.7	4.2	SR 20	Childs Creek	Barrier	67%	0	Unknown
991451	WFNC11	0		State		1	16.2	2.5	SR 9	Unnamed	Barrier	0%	0	Unknown
994216	CDUS4	0		State		0.1	9.1	1.25	unnamed; SR 20	Unnamed	Barrier	33%	0	Unknown
994276	CDUS5	0		State		9	50	1.1	SR 20	Unnamed	Barrier	0%	0	Unknown
994947	DMUS1	0		State		1	17.3	0.7	SR 20	Unnamed	Barrier	0%	0	Unknown
995097	CDUS11	0		State		3	25.4	2	SR 20	Backus Creek	Barrier	33%	0	Unknown
995434	HCUS1	0		State			24.5		SR 20	Unnamed	Unknown	Unknown	0	Unknown
997401	CDUS1	0		State		9	32.9	0.4	SR 20	Unnamed	Barrier	0%	0	Unknown
997712	HIUS1	0		State		2.5	18.1		SR 530	Unnamed	Barrier	0%	0	Unknown
03.0181	0.55	CRFC4	1	12924	County	6	34.2	7.6	Cedardale Rd	Fisher Creek	Barrier	67%	21	Yes
CR26	CR2	1	8745	County	Skagit County	4	12.6	7.55	Cascade Ridge Rd	Carpenter Creek	Barrier	33%	11	Yes
03.0279	0.10	HCCC1	1	8564	County	7.04	30.48	6.3	Hoehn Rd	Coal Creek	Unknown	Unknown		Unknown
IL26	ILMA1	1	7376	County	Skagit County	2.13	12.6	18.5	Martin Rd	Martin Slough	Barrier	0%	0	Yes
NC6	EFNC4	1	6925	Private	Private	0.5	7	2		Klahowya Creek	Barrier	67%	2	Yes
SP4	SPGC1	1	5620	Private	Private		7	3	Private	Green Creek	Barrier	67%	4	Yes
DC2	DCMC1	1	4530	Private	Private		6.3	3		Mouse Creek	Barrier	Unknown	3	Yes
NC60	EFNC3	1	4498	Private	Private	0.5	6	2		Cold Springs Creek	Barrier	67%	1	Yes
SP10	SPEC1	1	2783	Private	Private		12.5	6.09		Everett Creek	Unknown	Unknown	1	Yes
04.0434A	0.00	GRLC1	1	2040	County	4	57.9		Dalles Rd	Lorenzan Creek	Barrier	67%	10	Yes
03.0182	1.85	CRFC1	1	1738	County	7.55	32	3.3		Milltown Creek	Barrier	67%	1	Yes
AR8	ARMC2	1	1724	County		2	12.6	2.84	Hamilton Cemetery Rd	Mannser Creek	Barrier	33%	1	Yes
HC45	HC4	1	862	Private	Private		7.8	1		Unnamed	Unknown	Unknown	1	No
HC103	HCML1	1	737	Private	Private		60	1		Unnamed	Barrier	Unknown	0	Yes
DB2	DB1	1	731	Federal			8	3	FR1050	Unnamed	Barrier	Unknown	1	Unknown
NC88	WFNC5	1	717	Private	Private	0.5	5.8	5.7	private	Trumpeter Creek	Unknown	Unknown	6	Yes
930848	HC1	1	596	Private	Private	1.2	9.4	2.8		Unnamed	Barrier	67%	27	Yes
NC217	WFNC3	1	580	Private	Private	0.1	7.7	2.1		Gibble Creek	Barrier	67%	6	Yes
03.0183	0.10	CRFC2	1	437	County	4.3	20.4	5.3	Franklin Rd	Unnamed	Barrier	33%	7	Yes
GN8	GNMC2	1	422	Private	Private		3	2.5		Unnamed	Unknown	Unknown	3	Yes
SP1	SPPC1	1	406	County	Skagit County	3.85	19	2.3	E Sauk Prairie Rd	Prairie Creek	Barrier	0%	4	Yes
CD5	CDUS8	1	293	County		3.68	12.5	4.3	Sauk City Rd	Unnamed	Barrier	0%	5	Yes
SP30	SPWK1	1	256	County			12.4	1.5	Crawford Loop Rd	Wakon Creek	Unknown	Unknown	3	No
933580	CRBD2	1	238	County	County	2.06	17.4	2	Cedardale Road	Unnamed	Barrier	33%	1	Yes
JB8	JBUS8	1	135	Private	Private		5.5	1		Unnamed	Unknown	Unknown	1	No
700217	EFNC6	1	134	Private	Private	1.5	6	1.4	Taylor Road (Private)	Unnamed	Barrier	0%	1	No
HC85	HCJC1	1	130	County		1.25	7.5	4.2	Pipeline Rd	Pipeline Creek	Barrier	67%	4	Yes
GR39	GRUS1	1	78	Private	Private	0.5	6.1	0.8	Piscatore Ln	Unnamed	Barrier	33%	2	Yes
994219	CDUS6	1	73	Private	Private	3.5	15.5	2.9	private	Unnamed	Barrier	33%	1	Yes
CD2	CDUS10	1	34	Private	Private		15	5		Unnamed	Unknown	Unknown	1	Yes
JB5	JBUS7	1	34	Private	Private		15	2	E Cascade Dr	Day Creek	Barrier	Unknown	1	Yes
JK4	CDUS3	1	28	Private	Private	2	17.1	2.5	driveway	Unnamed	Barrier	67%	6	No
GN3	GNMC1	1	27	County		1.28	11.4	2.5	Potts Rd	Unnamed	Barrier	67%	1	No
GR55	GRUS2	1	23	Private	Private	1.5	14.1	3.4	Unnamed	Ebing Creek	Barrier	0%	1	Yes

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03.0266	0.00	SFBC1	1	11	Private	Private		18.3	3.7		Brickyard Creek	Barrier	67%	23	Yes
04.0373	0.10	PNUS2	1	0	County		3	20.1	3.1	S Skagit Hwy	Unnamed	Barrier	33%	1	Yes
AR25		ARCC1	1	0	City		3	15.5	4	1st St	Careys Creek	Barrier	67%	10	No
CR225		CRSW1	1	0	Private	Private		18.6	2		Unnamed	Barrier	Unknown	6	Yes
CR70		CRBD3	1	0	Drainage District			0.2			Maddox Creek / Big Ditch	Barrier	0%	8	Unknown
GN38		GNAS1	1	0	Private	Private		7	2		Unnamed	Unknown	Unknown	1	Yes
GR29		GRTL1	1	0	Private	Private		6		Tyee Dr	Unnamed	Barrier	Unknown	1	Yes
GR54		GREC1	1	0	State		4	26.2	4.1	SR 20	Eagle Creek	Barrier	33%	0	Unknown
HC106		HCSS4	1	0	Private	Private					Skiyou Slough	Unknown	Unknown	2	Yes
IL1		ILOC1	1	0	Private	Private		9.2	10		Obrian Creek	Barrier	Unknown	1	Yes
IL24		ILFL1	1	0	City						Lucas Slough	Unknown	Unknown	2	Unknown
IL4		ILOS1	1	0	Private	Private	0.2	6.2	3	private; Rockport Cascade	Obrian Slough	Barrier	67%	0	Yes
NC111		NCUS1	1	0	Private	Private		17.3	2		Unnamed	Barrier	33%	1	Yes
NC143		WFNC12	1	0	Private	Private		12.8	0.91		Unnamed	Barrier	67%	7	Yes
NC67		WFNC4	1	0	Private	Private	4	20	2.8	railroad grade	Unnamed	Barrier	67%	2	No
NC82		WFNC8	1	0	Private	Private		56.8	1.2	private; McLaughlin Rd	Unnamed	Unknown	Unknown	8	Yes
SF41		SFGS1	1	0	City			27	75	Burlington Blvd	Gages Slough	Unknown	Unknown	14	Unknown
600050		GDUS1	1		Federal		3	9.3	2.65	forest road; SR 20	Unnamed	Barrier	0%	3	Unknown
920242		HCUS2	1		City		2.5	25.4	3.7	River Rd	Unnamed	Barrier	67%	1	Unknown
932350		NCKC1	1		State		3	58	6	I-5	Kulshon Creek	Unknown	Unknown	10	Unknown
CR2		CRHD1	1		State		2	10.9	1.3	SR 534	Unnamed	Barrier	33%	16	Unknown
GN36		GNDS1	1		Private	Private	2.01	4.6	4.2		Unnamed	Barrier	33%	3	Unknown
JK2		CDUS2	1		State		2.5	94	4.1	SR 20	Unnamed	Barrier	0%	1	Unknown
IL20		ILBS1	2	73932	Private	Private		5	50		Barnaby Slough	Unknown	Unknown	1	Yes
HC14		HC3	2	39273	Private	Private	1	6.6	5.6		Unnamed	Barrier	33%	7	Yes
AR26		ARCC1	2	23710	Private	Private		9.3	4		Careys Creek	Barrier	67%	9	Yes
IL11		ILFL1	2	19810	County	Skagit County	1.52	11.2	8.4	Martin Ranch Rd	Unnamed	Barrier	67%	1	Yes
03.0181	2.45	CRFC4	2	7158	County		6	22.9		Starbird Rd	Fisher Creek	Barrier	67%	17	Yes
NC89		WFNC5	2	4521	Private	Private	1	12.2	5.7		Trumpeter Creek	Unknown	Unknown	5	Yes
HC63		HCCC1	2	2343	Private	Private	3	7.5	2.7	Unnamed	Unnamed	Unknown	Unknown	8	Yes
NC10		EFNC4	2	1909	Private	Private	1	12	2	Klahowya Rd	Klahowya Creek	Barrier	67%	1	Yes
1320286		EFNC6	2	1860	Private	Private	1.5	9.1	2.2	BPA;Walker Valley Rd	Walker Creek East Fork	Barrier	67%	0	Yes
GN35		GNDS1	2	1791	Private	Private	2.26	6	16.7		Unnamed	Unknown	Unknown	2	Yes
CR58		CRFC2	2	1446	Private	Private	2	11.8	6.2	Clarence Lane	Unnamed	Barrier	67%	6	Yes
IL3		ILOS1	2	1002	County		1.99	15.35	3.04	Rockport Cascade Rd	Unnamed	Barrier	67%	0	No
IL25		ILMA1	2	827	County	Skagit County	2.71	13.6	10	Martin Rd	Unnamed	Unknown	Unknown	0	Yes
SP18		SPPC1	2	663	Private	Private		8.5	2		Prairie Creek	Barrier	Unknown	3	No
HC46		HC4	2	626	County	Skagit County	5.35	21.1	1.1	Fruitdale Rd	Unnamed	Barrier	0%	0	No
JK5		CDUS3	2	584	Private	Private	2	10.1	2.5	driveway	Unnamed	Barrier	0%	5	No
ILSRSC1		ILHS1	2	485	County		1.17	12	4.4	Rockport Cascade Rd.	Unnamed	Barrier	67%	0	Yes
SP16		SPGC1	2	437	County		2.4	11	2.6	Sauk Prairie Rd	Dutch Creek	Unknown	Unknown	0	Yes
NC41		EFNC3	2	360	Private	Private		8.4	1.6		Cold Springs Creek	Barrier	33%	0	Yes
DC5		DCMC1	2	346	Private	Private		6	1.5		Mouse Creek	Unknown	Unknown	0	Yes
HC108		HCSS4	2	329	County					Duffy	Unnamed	Barrier	33%	0	Yes
JB22		JBUS2	2	286	County		0.65	12.9	4.57	Cascade Ridge Rd	Unnamed	Barrier	67%	0	Yes
GR17		GRLC1	2	230	County		1	6.6		Concrete Rd	Lorenzan Creek	Barrier	67%	8	Yes
03.0339A	0.10	ARMC2	2	211	Private	Private				abandoned	Unnamed	Barrier	0%	0	No
933581		CRBD2	2	200	Private	Private	1	6.5	2.7	unnamed	Unnamed	Unknown	Unknown	0	Yes
HC62		HCCC1	2	198	County		2.77	27.7	3.2	Minkler Rd	Little Coal Creek	Unknown	Unknown	0	Yes
JB31		JBHC1	2	196	County		1.71	42.4	5.5	Fish Hatchery Ln	Hatchery Creek	Barrier	Unknown	0	Yes
DB3		DB1	2	169	Private	Private	1.68	12.19	4.79	Dexter Ln	Unnamed	Barrier	33%	0	Yes
995341		WFNC12	2	153	Private	Private	1.5	37.7			Unnamed	Barrier	67%	1	No
GR44		GRUS2	2	140	County		1	11	3.4	Challenger Rd	Ebing Creek	Barrier	0%	0	Yes
CR76		CRFC4	2	134	County		5		2.18	Starbird Rd	Unnamed	Barrier	0%	0	Yes
132101923		CDUS8	2	130	Private	Private	0.8	7.4	1.98	Private;Sauk Store Rd	Unnamed	Barrier	0%	4	Yes
GR9		GRLC1	2	117	State		0.5	23.4	5.2	SR 20	Fish Creek	Barrier	33%	0	Unknown
JB20		JBUS2	2	115	Private	Private	1.21	6.14	4.83	Cascade Ridge Rd	Unnamed	Barrier	67%	0	Yes

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999054	CRFC4	2	103	Private	Private	1.5	10.7	0.6	driveway	Unnamed	Barrier	33%	1	No
GN4	GNMC1	2	59	Private	Private		4.9	0.76		Unnamed	Unknown	Unknown	0	No
DC8	DCMC1	2	54	Private	Private		5.5	1.5		Unnamed	Barrier	Unknown	1	Yes
HC47	HC1	2	52	Private	Private		7.6	1		Unnamed	Barrier	Unknown	2	No
GN14	GNMC2	2	47	Private	Private		4.7	2.5		Unnamed	Barrier	Unknown	1	No
JK3	CDUS2	2	46	Private	Private	2	10	2.5	driveway	Unnamed	Barrier	67%	0	No
995383	WFNC4	2	45	Private	Private	0.3	3.5	1	field access rd	Unnamed	Barrier	0%	1	No
NC212	WFNC12	2	31	Private	Private	0.5	7.6	0.9		Norway Park Creek	Barrier	67%	2	Yes
HC72	HCML1	2	5	County	Skagit County	1.65	12.2	2.18	Lyman-Hamilton Rd	Unnamed	Barrier	67%	1	Yes
HC51	HC1	2	1	Private	Private	2.5	7.8	1.9		Unnamed	Barrier	0%	8	Yes
994218	CDUS6	2	0	County		3.7	12.2	3.4	Sauk Store Rd	Unnamed	Barrier	0%	0	No
CR143	CRBD3	2	0	Drainage District		3	21.4	22		Maddox Creek / Big Ditch	Barrier	0%	7	Unknown
CR222	CRSW1	2	0	Private	Private		6.4	1.5		Unnamed	Barrier	Unknown	5	Yes
CR3	CRHD1	2	0	County		1.11	25.2	2.14	Conway Hill Rd	Unnamed	Barrier	33%	15	No
GN22	GNAS1	2	0	Private	Private					Unnamed	Unknown	Unknown	0	Yes
GN6	GNMC2	2	0	Private	Private	0.5	6.3	4	Private;Potts Rd	Unnamed	Barrier	33%	0	No
HC86	HCJC1	2	0	County	Skagit County	2.88	9.01	3.6	Pipeline Rd	Pipeline Creek	Barrier	0%	3	Yes
IL5	ILOS1	2	0	Private	Private		9.5	6		Obrian Slough	Unknown	Unknown	0	No
IL6	ILOC1	2	0	County		3.29	20	3.2	Rockport Cascade Rd	Obrian Creek	Barrier	0%	0	Yes
JB4	JBUS7	2	0	Private	Private		6	1.5		Day Creek	Barrier	Unknown	0	No
NC115	NCUS1	2	0	Private	Private		6	3		Unnamed	Barrier	67%	0	Yes
NC166	WFNC12	2	0	State		0.5	15.1	1	SR 9	Unnamed	Barrier	0%	0	Unknown
PN11	PNUS2	2	0	Private	Private		9.1	2.2		Unnamed	Barrier	Unknown	0	Yes
SF43	SFGS1	2	0	City		1.5	26.1	20	Anacortes St	Gages Slough	Barrier	33%	13	Unknown
SP23	SPSS1	2	0	County		3.18	16.3	6.56	Dearinger Park Rd.	Unnamed	Barrier	33%	0	No
SP31	SPWK1	2	0	Private	Private		4	1.5		Wakon Creek	Unknown	Unknown	2	No
SP6	SPGC1	2	0	Private	Private		7	2.5		Green Creek	Unknown	Unknown	2	Yes
XID1470	SPEC1	2	0	County		1	7.8	1.83	Sauk Prairie Rd	Unnamed	Unknown	Unknown	0	Yes
600049	GDUS1	2		Federal		2	6	2	forest road; SR 20	Unnamed	Barrier	67%	2	Unknown
990641	WFNC12	2		State		2	12.5	1.6	SR 9	Unnamed	Barrier	67%	0	Unknown
991123	ARUS1	2		State		1	15.5	2.1	SR 20	Unnamed	Barrier	33%	4	Unknown
991148	ARUS1	2		State		1	15.2		SR 20	Unnamed	Unknown	Unknown	0	Unknown
991150	GREC1	2		State		5	29.2	2.1	SR 20	Eagle Creek	Barrier	67%	0	Unknown
997396	GRUS1	2		State		1.5	21.2	2	SR 20	Unnamed	Barrier	67%	1	Unknown
HC.SFEG1	HCUS2	2		City	Sedro Woolley	1.38	6	1.93	Bark Park	Unnamed	Barrier	67%	0	Unknown
IL14	ILHS1	2		City		0.5	5.9	4		Unnamed	Barrier	33%	2	Unknown
NC107	WFNC8	2		City		1	29.8	4	N35th St	Unnamed	Barrier	0%	1	Unknown
NC118	NCKC1	2		City		0.5	20	6.2		Kulshon Creek	Unknown	Unknown	9	Unknown
NC129	WFNC8	2		State		1	31.6	6.6	SR 538	Logan Creek	Barrier	33%	5	Unknown
SF71	SFBC1	2		City		4	18.8	3.7	SR 20	Brickyard Creek	Unknown	Unknown	22	Unknown
AR39	ARCC1	3	33143	City		3.96	16.8	45	Pettit Rd	Careys Slough	Unknown	Unknown	8	Yes
IL12	ILHS1	3	6324	County	Skagit County	1.25	12.3	3.2	Martin Ranch Rd	Unnamed	Barrier	67%	1	Yes
HC16	HC3	3	1982	Private	Private	0.5	5.6	8.5		Unnamed	Barrier	67%	6	Yes
999792	CRFC4	3	1960	Private	Private	1	6	0.6		Unnamed	Barrier	33%	0	Yes
HC41	HC3	3	1893	County		6.78	26		footpath @ N. State	Dairy Creek	Unknown	Unknown	0	No
GR18	GRLC1	3	1162	County		2.5	109.1		Concrete Sauk Valley Rd	Lorenzan Creek	Barrier	33%	7	Yes
NC120	NCKC1	3	1035	Private	Private	1.5	18.5	5.6		Kulshon Creek	Unknown	Unknown	3	Yes
999103	CRFC4	3	803	Private	Private	0.5	4.9	1.4	private	Fisher Creek	Barrier	67%	10	Yes
995382	WFNC4	3	796	Private	Private	1	6.2	1		Unnamed	Barrier	0%	0	No
JB25	JBCC1	3	734	County		2.34	14.6	13.14	Rockport Cascade Rd	Clark Creek	Barrier	67%	5	Yes
HC91	HC1	3	536	County		7	31.5	7.6	Fruitdale Rd	Unnamed	Barrier	0%	7	Yes
SP19	SPPC1	3	529	Private	Private		12	2.5		Prairie Creek	Barrier	Unknown	2	No
IL10	ILFL1	3	517	County		2.52	14.32	4.9	Rockport Cascade Rd	Unnamed	Barrier	67%	0	Yes
HC.SRSC1	HC1	3	473	County		5.8	30.2	1.95	Fruitdale Road	Unnamed	Barrier	33%	0	No
SP8	SPGC1	3	449	Private	Private	1.19	6.2	2.8	Private Road	Everett Lake	Barrier	33%	0	Yes
03.0183 0.70	CRFC2	3	311	County		12.88	66.1	2.33	Bonniewiew Lane	Unnamed	Barrier	33%	5	Yes
992697	CRBD2	3	287	Private	Private	2	5.8	2.6	farm access rd	Maddox Creek / Big Ditch	Barrier	67%	0	Yes

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SP17	SPGC1	3	284	Private	Private			3		Unnamed	Unknown	Unknown	0	Yes
NC70	WFNC3	3	274	Private	Private	0	3.2	1.4	Cultus Ct	Gribble Creek	Barrier	67%	4	Yes
HC64	HCCC1	3	268	Private	Private	1.5	8.3	2.7		Unnamed	Unknown	Unknown	7	Yes
HC87	HCJC1	3	261	County	Skagit County	2	9.4	5.2	Pipeline Rd	Pipeline Creek	Barrier	33%	2	Yes
CR77	CRFC4	3	244	County		6	21.4	4.62	Bulson Rd	Starbird Creek	Barrier	33%	4	Yes
HC52	HC1	3	212	County		5.25	26.5	1.39	Fruitdale Rd	Unnamed	Barrier	0%	7	No
ILSRSC2	ILMA1	3	210	Private	Private	1.42	4.85	10			Barrier	33%	0	Yes
M88	MBBL1	3	173	Federal	US Forest	1.15	10.5	6.34		Little Park Creek	Barrier	33%		Unknown
HC49	HC1	3	141	Private	Private	1.15	5.4	3.1	Access trail to powerlines		Barrier	0%	1	No
920341	WFNC5	3	112	Private	Private	1	60.2	1.8		Trumpeter Creek	Barrier	0%	4	Yes
GR10	GRLC1	3	112	County		2.66	12.19	3.83	Cascade Trail	Fish Creek	Barrier	67%		Unknown
GR40	GRUS1	3	107	County		1	10.3	2.55	Challenger Rd	Unnamed	Barrier	0%	0	Yes
995340	WFNC12	3	72	Private	Private	1	10	1.2		Unnamed	Barrier	67%	0	No
NC213	WFNC12	3	28	Private	Private	1.56	11	1.9	Pavilion Drive	Norway Park Creek	Barrier	0%	1	Yes
995440	ARUS1	3	26	County		2.09	12.3	2.95	Cascade Trail	Unnamed	Barrier	33%	2	No
HC48	HC1	3	14	Private	Private	0.67	7.2	1		Unnamed	Barrier	Unknown	0	No
CR153	CRBD3	3	0	Private	Private		9.7	2		Unnamed	Barrier	33%	2	Yes
CR220	CRSW1	3	0	Private	Private	0.2	26.8	1.5		Unnamed	Barrier	Unknown	4	Yes
CR72	CRBD3	3	0	Private	Private		7	0.38		Unnamed	Barrier	Unknown	3	Yes
DC9	DCMC1	3	0	County			15	1.5	Sauk Prairie Rd crossing	Unnamed	Barrier	Unknown	0	Yes
GN12	GNMC2	3	0	Private	Private		5.6	0.9		Unnamed	Unknown	Unknown	0	No
HC120	HC3	3	0	State			20.5	1	SR 20	Unnamed	Unknown	Unknown	0	Unknown
HC121	HC3	3	0	State			23.2	0.75	SR 20	Unnamed	Unknown	Unknown	1	Unknown
MB7	MBBL1	3	0	Federal	US Forest	1.36	13.95		USFS 11	Unnamed	Barrier	33%		Unknown
NC12	EFNC4	3	0	Private	Private	1	8	2.5		Klahowya Creek	Barrier	67%	0	Yes
SP34	SPWK1	3	0	Private	Private		4	1.5		Wakon Creek	Unknown	Unknown	1	No
600051	GDUS1	3		Federal		1.5	6.2	4.85	forest road; SR 20	Unnamed	Barrier	67%	0	Unknown
920286	WFNC8	3		City			350	4	N 35th Pl	Unnamed	Unknown	Unknown	0	Unknown
920306	SFGS1	3		City		2	11.6	15	Sharon St	Gages Slough	Unknown	Unknown	12	Unknown
932472	GDUS1	3		State		3.5	45.9		SR 20	Unnamed	Unknown	Unknown	0	Unknown
991151	GREC1	3		State		1.4	28.3	3.1	SR 20	Eagle Creek	Barrier	0%	2	Unknown
995265	CRHD1	3		State		1.5	67.7	3.1	SR 534	Unnamed	Barrier	0%	14	Unknown
CR28	CR2	3		City	Mount Vernon	7.79	35.05	4.9	E Hickox Rd	Carpenter Creek	Barrier	33%	9	Unknown
NC124	NCKC1	3		City		0.5	14.8	2.7		Unnamed	Unknown	Unknown	1	Unknown
NC125	NCKC1	3		City		1	20.3	8.9	Roosevelt Rd	Unnamed	Unknown	Unknown	2	Unknown
NC138	WFNC8	3		City		1	25.5	5.6	30th St	Logan Creek	Barrier	33%	4	Unknown
SF78	SFBC1	3		City			21.9	3.7	F&S Grade Rd	Brickyard Creek	Unknown	Unknown	21	Unknown
03.0181 4.84	CRFC4	4	5974	Private	Private	0.5	6.2	1.4	private; 36th Ave NW	Fisher Creek	Barrier	67%	9	Yes
CR196	CRFC4	4	4906	Private	Private	2.5	10.3	3.1		Starbird Creek	Barrier	33%	2	Yes
931695	ARCC1	4	2511	Private	Private	0.1	3	16.2		Careys Creek	Barrier	67%	6	Yes
920330	WFNC8	4	2456	Private	Private	1.5	65.9	3.7	Helen Dr	Unnamed	Unknown	Unknown	3	Yes
GN.SFEG1	GNDS1	4	1707	Private	Private	1	6	3.7	NA - Private Farm road	Day Creek Slough	Barrier	Unknown	0	No
HC88	HCJC1	4	1262	County	Skagit County	2.81	10.8	4.9	Pipeline Rd	Pipeline Creek	Barrier	0%	1	Yes
CR100	CR2	4	1115	Private	Private	1.67	5.8	3.77	Private drive off Little	Carpenter Creek	Barrier	33%	6	Yes
NC74	WFNC3	4	1093	Private	Private	1	3.5	2.8	farm rd; SR 9	Gribble Creek	Barrier	67%	3	Yes
03.0183 1.20	CRFC2	4	836	County		15.37	85	3.55	Starbird Road	Unnamed	Barrier	0%	4	Yes
SP20	SPPC1	4	798	Private	Private		22	2.5	Prairie Rd	Prairie Creek	Barrier	Unknown	1	No
IL9	ILHS1	4	659	County		1.31	12.1	3.3	Rockport Cascade Rd	Unnamed	Barrier	33%	0	Yes
HC65	HCCC1	4	347	Private	Private	2	9.8	2.7		Unnamed	Unknown	Unknown	6	Yes
HC53	HC1	4	327	State		1	11.9	0.9	SR 9	Unnamed	Barrier	33%	6	Unknown
SP21	SPPC1	4	289	County			6.3	1.5	E. Sauk Prairie Road	Unnamed	Barrier	Unknown	0	No
HC.SKCO5	HC3	4	256	County		3.65	25	2	Cokedale Ln	Dairy Creek	Barrier	0%		Unknown
999772	CRFC4	4	245	Private	Private	1	6.5	0.55		Unnamed	Barrier	67%	0	Yes
JB34	JBCC1	4	174	County		1.6	9.2	13.4	Clark Rd	Clark Creek	Barrier	67%	1	Yes
CR140	CR2	4	136	Private	Private	1.27	7.6	4.16	Private - farm access	English Creek	Barrier	33%	1	Yes
931570	GREC1	4	99	County		1.5	11.6	2.2	Cascade Trail	Eagle Creek	Barrier	0%	1	Yes
920342	WFNC5	4	58	Private	Private	1	9	1.8		Trumpeter Creek	Barrier	0%	3	Yes

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JB35	JBCC1	4	34	County		1.01	9.61	3	Clark Rd	Clark Creek	Barrier	67%	1	Yes
991924	CRBD2	4	13	Private	Private	3	8.5	0.76	logging rd; English Rd	Unnamed	Barrier	0%	0	No
994213	CDUS8	4	0	County		2	18.7	1.75	Sauk Connection Rd	Unnamed	Barrier	33%	2	Yes
AR28	ARCC1	4	0	County		4.11	22.25	30	Lyman Hamilton Rd	Careys Creek	Unknown	Unknown	0	No
CR166	CRBD3	4	0	Private	Private		9.6	2		Unnamed	Barrier	Unknown	1	Yes
CR216	CRSW1	4	0	County			13.6	1	Pacific Hwy	Unnamed	Barrier	Unknown	3	Yes
JB.SRSC1	JBCC1	4	0	County		1.4	13.3	6	Clark Rd	Unnamed	Barrier	0%	0	Yes
JB.SRSC2	JBCC1	4	0	County		1.24	10.8	2.6	Clark Rd	Unnamed	Barrier	67%	0	Yes
NC123	NCKC1	4	0	City		4	11.4	4.3	Kulshon Trail	Unnamed	Unknown	Unknown	0	Unknown
920285	NCKC1	4		City		1	36.9	6		Unnamed	Barrier	33%	1	Unknown
920287	WFNC8	4		City		1	23.1	2.6	N 30th St	Unnamed	Barrier	0%	0	Unknown
990091	WFNC12	4		State		8	44.6	3.2	SR 9	Norway Park Creek	Barrier	0%	0	Unknown
991142	HC3	4		State		0.3	15.4	1.3	SR 20	Unnamed	Barrier	67%	1	Unknown
991143	HC3	4		State		3	21.7		SR 20	Unnamed	Unknown	Unknown	3	Unknown
991725	CRBD2	4		State		3	51		I-5	Maddox Creek / Big Ditch	Barrier	67%	0	Unknown
995224	CRBD2	4		State		3	71.2	3.3	I-5	Unnamed	Unknown	Unknown	0	Unknown
995225	CRBD2	4		State		2	77.6	1.1	I-5	Unnamed	Unknown	Unknown	0	Unknown
995335	CRHD1	4		Other		3	170.3	0.7		Unnamed	Barrier	0%	13	Unknown
GR19	GRLC1	4		City		1	14.8		Fir St	Lorenzan Creek	Barrier	67%	6	Unknown
NC121	NCKC1	4		City		0.6	18.8	5.6	Parker Way	Kulshon Creek	Unknown	Unknown	0	Unknown
SF82	SFBC1	4		City		3	16	2.4	Jones Rd	Brickyard Creek	Unknown	Unknown	20	Unknown
CR96	CRBD2	5	8668	Private	Private	3	5.9	10	private; Pioneer Hwy	Maddox Creek / Big Ditch	Unknown	Unknown	0	Yes
992698	CRBD2	5	4173	Private	Private	3	231		private	Maddox Creek / Big Ditch	Barrier	Unknown	0	Yes
NC75	WFNC3	5	614	Private	Private	1	10.3	1.9	private; Mt View Rd	Gribble Creek	Barrier	33%	2	Yes
CR60	CRFC2	5	363	County		4.29	39.7	2.67	Pacific Highway	Unnamed	Barrier	33%	1	No
CR128	CR2	5	340	Private	Private	1.46	9.14	5.24	Little Mountain Road	Carpenter Creek	Barrier	33%	0	Yes
920331	WFNC8	5	301	Private	Private	1.5	24.5	3.7	Juanita Pl	Unnamed	Barrier	33%	2	No
CR141	CR2	5	301	Private	Private	1.8	9.7	2.7	Private; Little Mt Rd	English Creek	Barrier	67%	0	Yes
982757	JBCC1	5	277	Private	Private	1.5	4.7	4		Unnamed	Barrier	0%	0	Yes
HC94	HC3	5	244	Private	Private	4	19.4	1	Parker Rd	Unnamed	Barrier	0%	0	Yes
995416	HC1	5	84	Private	Private	0	2.7	1.4		Unnamed	Barrier	67%	10	Yes
CR67	CRBD3	5	82	County		4.23	18.9	0.6	Haugen	Unnamed	Barrier	33%	1	Yes
HC66	HCCC1	5	79	Private	Private	2	13.6	2.7		Unnamed	Unknown	Unknown	5	Yes
920343	WFNC5	5	72	Private	Private	1	32.5	1.8		Trumpeter Creek	Barrier	0%	2	Yes
HC92	HC1	5	66	County		6	19.5	1.7	Mosier Rd	Unnamed	Barrier	0%	5	Yes
931571	GREC1	5	56	Private	Private	2	13.5	2.2		Eagle Creek	Barrier	0%	0	Yes
999104	CRFC4	5	54	Private	Private	1	3	1.5		Fisher Creek	Barrier	33%	8	Yes
931699	CDUS3	5	43	Private	Private	0.5	6.1	3.3	private	Unnamed	Barrier	33%	0	No
931696	CDUS3	5	41	Private	Private	2.5	6.2	3.2		Unnamed	Barrier	0%	1	No
995337	CRHD1	5	37	Private	Private	0.5	12	1.5	East Conway Hill Lane	Unnamed	Barrier	33%	12	Yes
HC90	HCJC1	5	34	County	Skagit County	1.46	7	1.7	Pipeline Rd	Unnamed	Barrier	33%	0	Yes
HC57	HC1	5	16	Private	Private	0.3	3.9	1.6		Unnamed	Barrier	67%	6	Yes
920340	NCKC1	5	0	Private	Private		23.9			Unnamed	Barrier	0%	0	No
AR33	ARCC1	5	0	Private	Private		11.1		Crown Pacific 800 Rd	Unnamed	Unknown	Unknown	4	Yes
AR34	ARCC1	5	0	Private	Private		9.2	0.9	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	3	Yes
AR35	ARCC1	5	0	Private	Private		9.5	0.9	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	2	Yes
AR36	ARCC1	5	0	Private	Private		9.7	1	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	1	Yes
AR37	ARCC1	5	0	Private	Private		11.7	1	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	0	Yes
CR144	CRSW1	5	0	County			11		Logen Rd	Unnamed	Unknown	Unknown	0	Yes
CR162	CRBD3	5	0	Private	Private		9	2		Unnamed	Barrier	Unknown	0	Yes
CR219	CRSW1	5	0	County		1	20.7	1	Dettling Rd	Unnamed	Unknown	Unknown	2	Yes
HC18	HC3	5	0	Private	Private		5.2	1.6		Unnamed	Unknown	Unknown	2	Yes
SF45	SFGS1	5	0	City		1.5	19	12	E Rio Vista Blvd	Gages Slough	Barrier	67%	10	Unknown
991149	ARUS1	5		State		1	13.6	0.9	SR 20	Unnamed	Unknown	Unknown	0	Unknown
995242	CRFC2	5		State		7	182.9	1	I-5; NB Ext 218	Unnamed	Barrier	33%	1	Unknown
995436	ARCC1	5		State		4	30.5	1.9	SR 20	Unnamed	Unknown	Unknown	0	Unknown
CR79	CRFC4	5		Private	Private	1.93	9.95	4.14	Fremali Ln	Starbird Creek	Barrier	0%		Unknown

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GR20	GRLC1	5		City		1	31.3		S Park Ave	Lorenzan Creek	Barrier	67%	5	Unknown
NC122	NCKC1	5		City		2.5	25.1	7.1	18th St	Kulshon Creek	Barrier	33%	1	Unknown
SF83	SFBC1	5		City			14.8	2.4	Sapp Rd	Brickyard Creek	Unknown	Unknown	19	Unknown
CR131	CR2	6	21380	Private	Private	1.18	12.5	3.6		Unnamed	Barrier	33%	0	Yes
HC93	HC1	6	4259	State		4	12.5	2.9	SR 9	Unnamed	Barrier	0%	4	Unknown
CR84	CRFC4	6	2884	County		2	10.2	3.46	Brandstrom Rd	Fisher Creek	Barrier	Unknown	7	Yes
990608	CRSW1	6	1281	County					Pioneer Hwy	Unnamed	Barrier	0%	0	Yes
GR22	GRLC1	6	1281	City		1	27.3		Superior Ave	Lorenzan Creek	Barrier	33%	4	Unknown
920332	WFNC8	6	1005	Private	Private	1.5	18.2	3.7	Martha Dr	Unnamed	Barrier	67%	1	No
CR61	CRFC2	6	954	Private	Private		12.2	1	Bruun Rd	Unnamed	Barrier	Unknown	0	No
932312	HCCC1	6	922	Private	Private	1.5	11.4	2.7		Unnamed	Unknown	Unknown	4	Yes
CR66	CRBD3	6	776	County			16	2.3	Countyline Rd	Unnamed	Barrier	Unknown	0	Yes
CR197	CRFC4	6	702	Private	Private	0.3	3	1		Unnamed	Barrier	33%	0	Yes
SF92	SFBC1	6	611	Private	Private		6	2.5		Brickyard Creek	Unknown	Unknown	10	Yes
930950	CRFC2	6	482	Private	Private	0.5	4	3.5		Unnamed	Barrier	33%	0	Yes
920345	WFNC5	6	358	Private	Private	0.5	18.9	1.8		Trumpeter Creek	Barrier	0%	1	Yes
931697	CDUS3	6	298	Private	Private	1	6.6	3.2		Unnamed	Barrier	67%	0	No
HC58	HC1	6	284	Private	Private	0.2	9.4	2.4	Cordy Ln	Unnamed	Barrier	33%	5	Yes
930822	CRHD1	6	34	Private	Private	0.2	8.1	4.9		Unnamed	Barrier	0%	11	Yes
HC54	HC1	6	31	Private	Private	0.2	3.8	1.4		Unnamed	Barrier	33%	2	Yes
CR80	CRFC4	6	0	County		8	43.6	2.51	Starbird Rd	Unnamed	Barrier	0%	0	Yes
HC19	HC3	6	0	Private	Private		11	1.6		Unnamed	Barrier	Unknown	1	Yes
NC128	NCKC1	6	0	City		0.5	60.7	1.2	N 19th St	Kulshon Creek	Unknown	Unknown	0	Unknown
920308	SFGS1	6		City		2	15.4	10	Hawthorne St	Gages Slough	Unknown	Unknown	9	Unknown
920732	CRBD2	6		City		5	363	7.1	Anderson Rd	Martha Washington Creek	Barrier	33%	0	Unknown
991125	CDUS8	6		State		5	59.2	1	SR 20	Unnamed	Barrier	0%	0	Unknown
SF87	SFBC1	6		City		3	21.2	2.95	Sapp Rd	Unnamed	Unknown	Unknown	6	Unknown
SF88	SFBC1	6		City		1.5	20.8	1.5	Sapp Rd	Unnamed	Unknown	Unknown	0	Unknown
NC136	WFNC3	7	52298	County	Skagit County	6.85	23.3	4	Mountain View Rd	Unnamed	Barrier	67%	0	Yes
CR65	CRFC2	7	15352	County			12.6	1	324th St NW	Unnamed	Unknown	Unknown	0	No
03.0196 0.10	CRFC4	7	1098	County		2	12.4	2.2	324th St NW	Unnamed	Barrier	33%	1	Yes
SF93	SFBC1	7	673	City		1.5	15.9	3.3	Fruitdale Rd	Brickyard Creek	Barrier	67%	7	Unknown
SF107	SFBC1	7	547	Private	Private		6	2		Willard Creek	Barrier	Unknown	5	Yes
NC137	WFNC8	7	309	City		1.5	24.3	4	Alison Ave	Logan Creek	Barrier	33%	0	Unknown
SF108	SFBC1	7	258	Private	Private	0.3	6.4	1.2		Unnamed	Barrier	67%	1	Yes
GR23	GRLC1	7	227	State		6.5	32		SR 20	Lorenzan Creek	Barrier	0%	3	Unknown
CR88	CRFC4	7	182	Private	Private	1	5	1.6		Unnamed	Barrier	33%	0	Yes
995338	CRHD1	7	175	Private	Private	0.2	6.8	2.1	East Conway Hill Lane	Unnamed	Barrier	0%	10	Yes
HC59	HC1	7	141	Private	Private	0.2	4.4	2.2		Unnamed	Barrier	67%	4	No
CR136	CR2	7	120	Private	Private	2.25	7.3	3.1	Ervine Lane	Carpenter Creek	Barrier	33%	1	Yes
03.0181 5.76	CRFC4	7	97	County		2	11.6	2.22	English Grade Rd	Fisher Creek	Barrier	33%	2	Yes
931896	HC1	7	32	Private	Private	1.5	7.1	1.8		Unnamed	Barrier	33%	3	Yes
HC55	HC1	7	32	Private	Private	0.3	9.1	1.4		Unnamed	Barrier	33%	1	Yes
999388	CRFC4	7	0	Private	Private	1	5.3	0.6		Unnamed	Barrier	67%	0	No
CR122	CRBD2	7	0	State		5	100	7.1	I-5	Martha Washington Creek	Barrier	33%	0	Unknown
HC20	HC3	7	0	Private	Private		10.4	1.6		Unnamed	Barrier	Unknown	0	Yes
HC71	HCCC1	7	0	Private	Private		11	1		Unnamed	Barrier	Unknown	0	Yes
SF47	SFGS1	7	0	City			17	6	Monroe St	Gages Slough	Unknown	Unknown	8	Unknown
920346	WFNC5	7		City		1	16	2.3	Shoshone Dr	Trumpeter Creek	Barrier	0%	0	Unknown
920454	CRBD2	7		City		1.5			Cederdale Rd	Flowers Creek	Unknown	Unknown	0	Unknown
991547	HCCC1	7		State		3	27.3	2.7	SR 20	Unnamed	Barrier	33%	3	Unknown
SF104	SFBC1	8	17907	County		6.91	32.36	2.4	Bassett Rd	Unnamed	Barrier	33%	4	Yes
930823	CRHD1	8	111	Private	Private	0	6.2	1.5		Unnamed	Barrier	33%	9	Yes
930935	HC1	8	77	Private	Private	0.2	7	1		Unnamed	Barrier	33%	0	Yes
HC60	HC1	8	19	County		1.06	12.6	1.5	Mosier Rd	Unnamed	Barrier	67%	3	No
920453	CRBD2	8	0	Private	Private	1.5	19	3.3		Unnamed	Unknown	Unknown	0	No
CR124	CRBD2	8	0	City		2	75.7	7.5	Henson Rd	Martha Washington Creek	Barrier	33%	0	Unknown

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SF109	SFBC1	8	0	Private	Private	0.2	7.2	1.2		Unnamed	Barrier	33%	0	Yes
SF49	SFGS1	8	0	State		2	34.8		SR 20	Gages Slough	Barrier	33%	7	Unknown
931579	GRLC1	8		City		1.5	223		Main St	Lorenzan Creek	Barrier	0%	2	Unknown
930824	CRHD1	9	313	Private	Private	0.2	19.1	1.2		Unnamed	Barrier	33%	8	Yes
920300	CRBD2	9	43	Private	Private	1	170			Martha Washington Creek	Unknown	Unknown	0	Yes
930849	HC1	9	0	Private	Private	1	6.1	1.5	Unnamed	Unnamed	Barrier	0%	2	No
999107	CRFC4	9	0	Private	Private		9.5	0.95		Fisher Creek	Barrier	33%	0	No
HC70	HCCC1	9	0	Private	Private		5	1		Unnamed	Barrier	Unknown	0	Yes
SF112	SFBC1	9	0	County		4.5	18	1	Fredrickson Rd	Unnamed	Barrier	67%	0	Yes
SF114	SFBC1	9	0	County		1	12	1.3	Fredrickson Rd	Unnamed	Barrier	33%	2	Yes
03.2970 0.00	CRBD2	9		City		3	50.4	3.6	Blodgett Rd	Flowers Creek	Barrier	33%	0	Unknown
931354	GRLC1	9		City		1	9.6	2.3		Lorenzan Creek	Barrier	33%	1	Unknown
931899	HC1	10	78	Private	Private		10.9			Unnamed	Barrier	67%	0	Yes
SF96	SFBC1	10	34	State			19	2.5		Brickyard Creek	Barrier	Unknown	4	Unknown
930934	HC1	10	20	Private	Private	0.2	3.4	1.3		Unnamed	Barrier	0%	1	Yes
920302	CRBD2	10	12	Private	Private	1	20.8			Martha Washington Creek	Barrier	33%	0	Yes
SF115	SFBC1	10	0	Private	Private	0.8	36	1.3		Unnamed	Barrier	33%	1	Yes
SF52	SFGS1	10	0	City			23	21	Peacock Rd	Gages Slough	Unknown	Unknown	5	Yes
931355	GRLC1	10		City		3	106.4		Limestone St	Lorenzan Creek	Barrier	0%	0	Unknown
930870	HC1	11	195	Private	Private	0.2	3.9	1.7		Unnamed	Barrier	67%	0	Yes
SF110	SFBC1	11	158	Private	Private	4	23	2	access rd; Fruitdale Rd		Barrier	67%	3	Yes
930826	CRHD1	11	27	Private	Private	0.2	6.5	3.4		Unnamed	Barrier	0%	6	Yes
930827	CRHD1	12	65	Private	Private	0.4	6.7	3.2		Unnamed	Barrier	33%	5	Yes
SF97	SFBC1	12	14	Private	Private			2.5		Brickyard Creek	Barrier	Unknown	2	Unknown
930828	CRHD1	13	17	Private	Private	1.5	3.9	2		Unnamed	Barrier	33%	4	Yes
SF98	SFBC1	13	17	County				2.5	Fruitdale Rd	Brickyard Creek	Barrier	Unknown	1	Yes
SF55	SFGS1	13	0	State		1	31.1	2.1	SR 20	Gages Slough	Unknown	Unknown	2	Unknown
930829	CRHD1	14	585	Private	Private	1	6	2		Unnamed	Barrier	33%	3	Yes
SF99	SFBC1	14	517	Private	Private			2.5		Brickyard Creek	Barrier	Unknown	0	Yes
SF61	SFGS1	14	0	Private	Private		13	5		Gages Slough	Unknown	Unknown	1	Yes
930830	CRHD1	15	217	Private	Private	0.5	76.7	0.9		Unnamed	Barrier	0%	2	No
930831	CRHD1	16	0	County		1	10.8	2.3	Bulson Rd	Unnamed	Barrier	33%	1	No
930832	CRHD1	17	96	Private	Private	0.2	18.6	2.3		Unnamed	Barrier	33%	0	No

Table 10: Intersection with Injunction List Culverts

Twenty-eight state injunction list culverts have other upstream or downstream barriers present on the same stream system.

State Injunction Culvert ID	Upstream Culvert IDs	Downstream Culvert IDs	Other State Upstream	Other State Downstream
990091	---	NC212, NC213	---	---
991122	NC136, NC70, NC74, NC75	NC217	---	---
991123	991149, 995440, 995442	---	---	---
991125	---	994213, 994218, CD5	---	---
991126	---	CD4	---	---
991142	HC94	HC14, HC16	---	---
991150	931570, 931571	---	991151	GR54
991151	931570, 931571	---	---	991150, GR54
991547	HC71	932312, 03.0279 0.10, HC62, HC64, HC65, HC66	---	---
991707	---	994216	---	---
991710	---	994219	---	---
991725	920453, 992698, 03.2970 0.00	992697	---	---
995242	930950	03.0183 1.20, 03.0183 0.10, 03.0183 0.70, CR58	995221	---
995265	930822, 930823, 930824, 930826, 930827,	---	---	CR2
995436	---	931695, AR25, AR26, AR39	---	---
997396	GR40	GR39	---	---
CR122	CR124, CR126	920302, 920732	---	---
CR2	930822, 930823, 930824, 930826, 930827,	---	995265	---
GR23	---	04.0434A 0.00, GR17, GR18, GR19, GR20, GR22	---	---
GR54	931570, 931571	---	991150, 991151	---
GR9	GR10	04.0434A 0.00	---	---
HC53	930870, 930934, 930935, 995416, HC54, HC55,	930848, HC51, HC52	---	---
HC93	931896	930848, HC91, HC92	---	---
JK2	931696, 931697, 931699, JK3, JK4, JK5	---	---	---
NC129	920330, 920331, 920332, NC137, NC138	---	---	---
NC158	---	995340, 995341	---	---
NC69	---	995382, 995383, NC67	---	---
SF49	SF52, SF55, SF61	920306, 920308, SF41, SF43, SF45, SF47	---	---

APPENDIX B: Potential Projects for Chinook and Steelhead

Overview

We present here a series of tables that are subsets of our full culvert database to assist organizations with developing fish passage improvement projects that may be eligible for Salmon Recovery Funding Board (SRFB) funding in the Skagit River Basin. The Skagit Watershed Council (SWC) is the designated lead entity organization with responsibility to solicit for and provide local review of proposed salmon habitat restoration projects. To be eligible for SRFB funding, projects need to first be reviewed and supported through the SWC process. The SWC currently only considers projects that benefit Chinook salmon (*Oncorhynchus tshawytscha*) as eligible, but has been considering expanding eligibility to also include steelhead (*O. mykiss*). Methods for initial list development, barrier and habitat surveys, and GIS habitat estimates all follow those described in the main body of the Skagit Basin Barrier Culvert Analysis, but we have selected subsets of the full culvert database here to identify potential restoration projects that may benefit Chinook or steelhead as described below.

Chinook

The SWC has produced a Strategic Approach document (SWC 2015) that outlines a plan for focusing recovery efforts on meeting goals laid out in the Skagit Chinook Recovery Plan (SRSC and WDFW 2005). To target habitats thought to be most important for Chinook recovery, the SWC has developed a three-tiered system of target areas to assist with evaluating projects for potential Chinook benefit. The Strategic Approach states that “while projects in all tiers are consistent with the Chinook Recovery Plan, projects within Tier 1 and 2 target areas are the primary focus as they are the habitats with the greatest potential to increase Chinook salmon populations” (SWC 2015). In following with this rationale, we have stratified our barrier culvert list here by floodplain areas identified as SWC Tier 1 and 2 target areas. The Baker River watershed is excluded from the tier system, and is generally excluded from the SWC strategic approach (SWC 2015).

Within the tier system, the Strategic Approach also identifies 14 major tributaries for Chinook recovery (SWC 2015, Figure 1). No identified barrier culverts are located on the mainstem of any of these tributaries. While it is possible that some barriers exist on tributaries or side channels within the floodplains of these tributaries and would be eligible for funding, we do not have an existing GIS layer of these areas, so they are not presented here.

Within our database, we have records of 26 barrier removal projects completed in the Skagit Basin since 2000, 3 of which are located in Tier 1 target areas. An additional 3 Tier 1 barriers are funded for barrier removal design, directly as a result of this project, and 3 more Tier 1 sites currently have funding proposals in process. Outside of Tier 1, 3 additional projects are currently funded for barrier removal design.

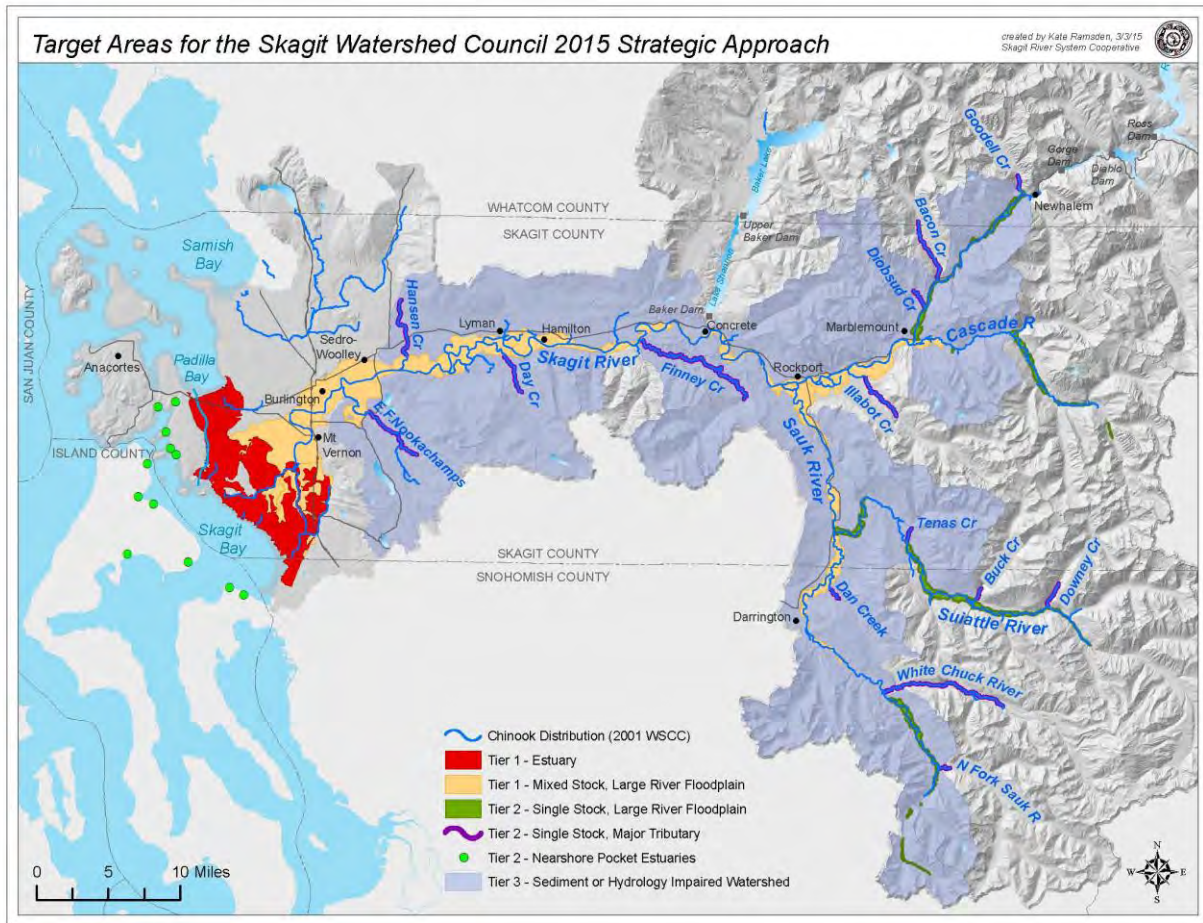


Figure 1. Map of project tiers and tributaries from the Skagit Watershed Council Year 2015 Strategic Approach. Identified major Chinook tributaries are shown in purple, and include the East Fork Nookachamps, Hansen Creek, Day Creek, Finney Creek, Diobsud Creek, Bacon Creek, Goodell Creek, Ilabot Creek, Tenas Creek, Buck Creek, Downey Creek, Dan Creek, the Whitechuck River, and the North Fork Sauk River.

Steelhead

While there is no finalized steelhead recovery plan specific to the Skagit basin, in 2016 the SWC published an interim Steelhead Strategy that builds upon the 2015 Strategic Approach and has been considering expanding eligibility to include projects that benefit steelhead. The interim strategy “explicitly incorporates steelhead and bull trout into our strategic habitat priorities... making them eligible for habitat grants and incorporating them into other planning and monitoring activities” (SWC 2016). In anticipation of this expansion in eligibility, we have selected from our list culverts believed to be located on steelhead habitat. Many projects targeted at Chinook will also benefit steelhead, but steelhead distribution can extend further up tributary streams. Accordingly, the SWC has extended upon and added to their key Chinook tributaries to include steelhead habitat, which can extend into higher gradient reaches (Figure 2). As with Chinook, for steelhead the Baker River watershed is excluded from the tier system, and is generally excluded from the SWC interim Steelhead Strategy (SWC 2016).

There are no barrier culverts identified on the steelhead tributaries, so we chose to simply select barrier culverts from the database that are likely impairing fish passage for steelhead. To do this, we used a draft WDFW fish distribution GIS layer to note culverts on streams with known or modeled steelhead use (WDFW 2018). It is important to note that fisheries co-managers have not officially adopted this layer, but it is currently our best available option for delineating steelhead usage throughout the study area. We recognize that revisions to these steelhead use determinations may be required.

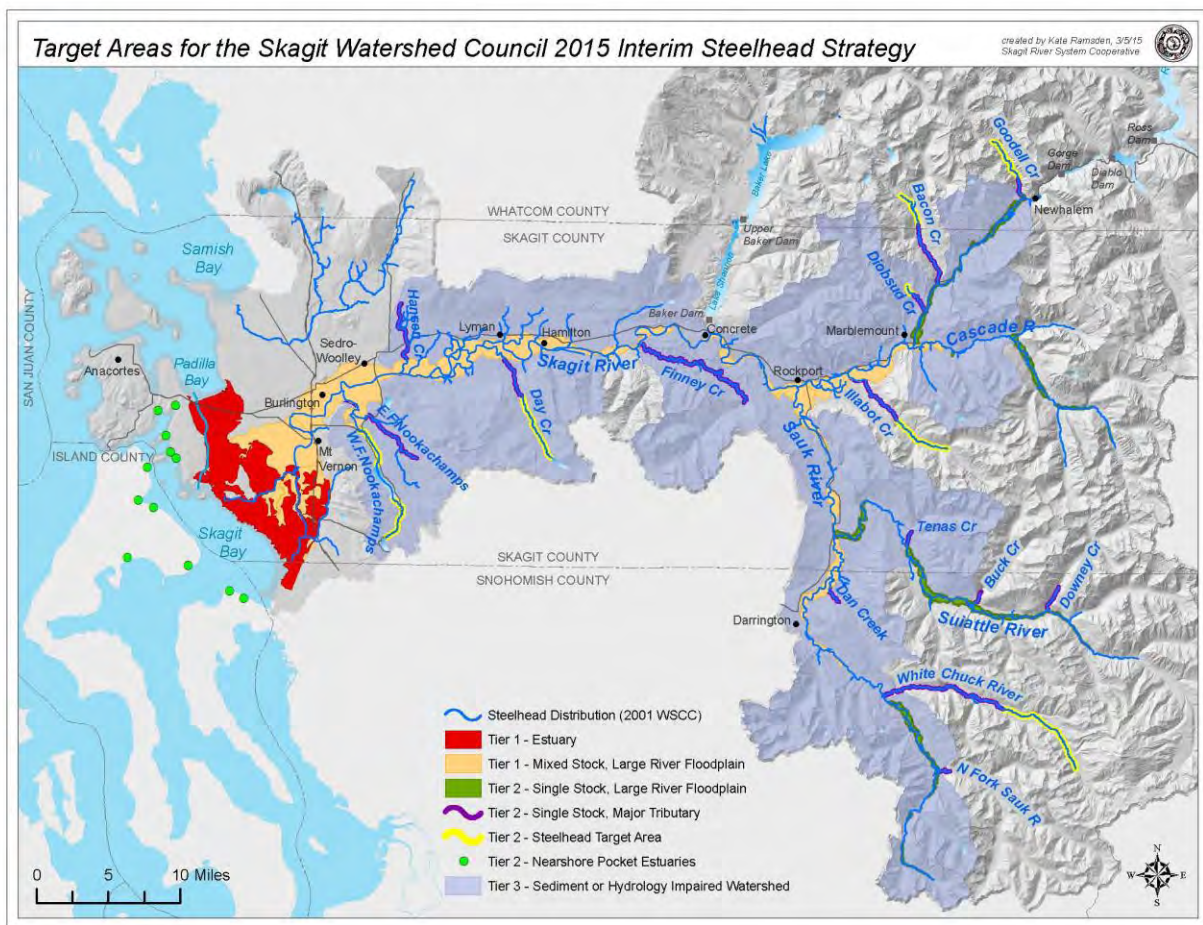


Figure 2. Map of project tiers and tributaries from the Skagit Watershed Council Year 2015 Strategic Approach. Identified major Steelhead tributaries are shown in yellow, and include the East and West Forks of Nookachamps Creek, Hansen Creek, Day Creek, Finney Creek, Diobsud Creek, Bacon Creek, Goodell Creek, Ilabot Creek, Tenas Creek, Buck Creek, Downey Creek, Dan Creek, the Whitechuck River, and the North Fork Sauk River.

RESULTS

Tier 1 and 2 Culverts

In the portion of the Skagit Basin encompassed by the SWC Strategic Approach, there are 66 barriers and 41 unknown status culverts in Tier 1. Twenty eight barrier or unknown culverts are County-owned, 39 are private, and 40 are under other public ownership. Four culverts have a weighted upstream habitat estimate (per Smith and Waldo 2003) greater than 10,000 m², 19 have between 1,000 and 10,000 m², 9 have between 200 and 1,000 m², and 13 have between 0 and 200 m² of upstream habitat. 40 culverts are estimated to have no upstream habitat, and no habitat estimate is available for an additional 22 culverts.

In Tier 2, there are 6 barriers and 3 unknown culverts. None of them are County-owned, while 1 is private and 8 are under other public ownership. Two culverts have between 200 and 1,000 m² of upstream habitat area, 1 has no upstream habitat, and no estimate is available for the remaining 6 crossings.

[See Appendix B, Table 1]

Culverts on Known and Modeled Steelhead Streams

In the portion of the basin covered by the SWC Strategic Approach and Steelhead Update (SWC 2016), there are 205 barrier culverts and 38 with unknown barrier status located on streams known or modeled to have steelhead use. 89 of these are County-owned, 152 are private, and 2 are under other public ownership. Eleven crossings have a weighted upstream habitat estimate greater than 10,000 m², 49 have between 1,000 and 10,000 m², 60 have between 200 and 1,000 m², and 61 have between 0 and 200 m² of upstream habitat. 62 crossings are estimated to have no upstream habitat.

[See Appendix B, Table 2]

REFERENCES

Skagit River System Cooperative and Washington Department of Fish and Wildlife. 2005. Skagit Chinook Recovery Plan. La Conner, Washington.

Skagit Watershed Council. 2016. Interim Steelhead Strategy. Mount Vernon, Washington.

Skagit Watershed Council. 2015. Year 2015 Strategic Approach. Mount Vernon, Washington.

Washington Department of Fish and Wildlife. 2018. Statewide Washington Integrated Fish Distribution. GIS layer. Accessed online via Washington State Fish Passage Web App.

Table 1: Skagit Watershed Council Tier 1 and 2 Barrier Culvert Overview

Barrier Status:

SWC Tier	Barriers	Unknown Barrier Status
Tier 1	66	41
Tier 2	6	3

Weighted Habitat Area (Smith and Waldo 2003)

SWC Tier	> 10,000 M ²	1,000 to 10,000 M ²	200 to 1,000 M ²	0 to 200 M ²	0 M ²	No Habitat Estimate Available
Tier 1	4	19	9	13	40	22
Tier 2	0	0	2	0	1	6

Owner Type

SWC Tier	County	Private	Other Public
Tier 1	28	39	40
Tier 2	0	1	8

Individual Details for Culverts (n = 116):

Site ID	Road Name	Stream Name	Barrier Status	% Passability	Barrier Reason	SWC Tier	Weighted Habitat
IL20		Barnaby Slough	Unknown	Unknown	Insufficient Data	1	73,932
AR39	Pettit Rd	Careys Slough	Unknown	Unknown	Level B - Slough	1	33,143
AR26		Careys Creek	Barrier	67%	Velocity	1	23,710
IL11	Martin Ranch Rd	Unnamed	Barrier	67%	Drop and Slope	1	19,810
CR96	private; Pioneer Hwy	Maddox Creek / Big Ditch	Unknown	Unknown	Level B - Survey Needed	1	8,668
IL26	Martin Rd	Martin Slough	Barrier	0%	Slope	1	7,376
IL12	Martin Ranch Rd	Unnamed	Barrier	67%	Drop and Slope	1	6,324
SP4		Green Creek	Barrier	67%	Drop	1	5,620
GN18	S Skagit Hwy	Gilligan Creek	Barrier	33%	Slope	1	4,729
DC2		Mouse Creek	Barrier	Unknown	Slope	1	4,530
992698	private	Maddox Creek / Big Ditch	Barrier	Unknown	Depth	1	4,173
933794	Debays Isle Road	Debays Slough	Unknown	Unknown	Level B - Slough	1	2,721
931695		Careys Creek	Barrier	67%	Velocity	1	2,511
DC15	N Sauk River Rd	Unnamed	Unknown	Unknown	Unknown	1	2,310
04.0434A 0.00	Dalles Rd	Lorenzan Creek	Barrier	67%	Drop	1	2,040
JB38	South Cascade Rd	Clark Creek	Barrier	33%	Slope	1	1,884
04.0675 0.54	Concrete-Sauk Valley Rd	Rudd Creek	Barrier	33%	Drop	1	1,844
GN35		Unnamed	Unknown	Unknown	Level B - Survey Needed	1	1,791
GN.SFEG1	NA - Private Farm road	Day Creek Slough	Barrier	Unknown	Judgement Call - See Notes	1	1,707
RC4	Concrete Sauk Valley Rd.	Hobbit Creek	Barrier	0%	Drop and Slope	1	1,546
RC5	Concrete-Sauk Valley Rd	Osterman Creek	Barrier	0%	Drop and Slope	1	1,293
HC110	Hoehn Rd	Unnamed	Barrier	67%	Depth	1	1,174
NC120		Kulshon Creek	Unknown	Unknown	Level B - Survey Needed	1	1,035
IL25	Martin Rd	Unnamed	Unknown	Unknown	Level B - Slough	1	827
JB25	Rockport Cascade Rd	Clark Creek	Barrier	67%	Slope	1	734
RC7	Old Concrete-Sauk Valley	Flume Creek	Unknown	Unknown	Level B - Survey Needed	1	436
FC14	Cedar Grove Rd	Unnamed	Unknown	Unknown	Level B - Slough	1	289
992697	farm access rd	Maddox Creek / Big Ditch	Barrier	67%	Slope	1	287
982757		Unnamed	Barrier	0%	Other	1	277
933580	Cedardale Road	Unnamed	Barrier	33%	Depth	1	238
ILSRSC2			Barrier	33%	Slope	1	210
03.0280 0.00	Utopia Rd	Wiseman Creek	Barrier	0%	Tidegate	1	204
933581	unnamed	Unnamed	Unknown	Unknown	Level B - Survey Needed	1	200
JB31	Fish Hatchery Ln	Hatchery Creek	Barrier	Unknown	Undersized	1	196
JB34	Clark Rd	Clark Creek	Barrier	67%	Velocity	1	174
DC14	N Sauk River Rd	Unnamed	Barrier	Unknown	Slope	1	155
JB8		Unnamed	Unknown	Unknown	Unknown	1	135
JB20	Cascade Ridge Rd	Unnamed	Barrier	67%	Velocity and Slope	1	115
GR39	Piscatore Ln	Unnamed	Barrier	33%	Undersized	1	78
JB16		Boulder Creek	Barrier	Unknown	Unknown	1	50
920300		Martha Washington Creek	Unknown	Unknown	Insufficient Data	1	43
CD2		Unnamed	Unknown	Unknown	Unknown	1	34
JB35	Clark Rd	Clark Creek	Barrier	67%	Drop	1	34
991924	logging rd; English Rd	Unnamed	Barrier	0%	Drop	1	13
03.0266 0.00		Brickyard Creek	Barrier	67%	Drop	1	11
04.0644 0.20	Concrete Sauk	Unnamed	Barrier	0%	Drop and Slope	1	0
920340		Unnamed	Barrier	0%	Debris	1	0
AR25	1st St	Careys Creek	Barrier	67%	Velocity	1	0
AR28	Lyman Hamilton Rd	Careys Creek	Unknown	Unknown	Level B - Slough	1	0
AR36	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	Drop	1	0
CR122	I-5	Martha Washington Creek	Barrier	33%	Other	1	0
CR124	Henson Rd	Martha Washington Creek	Barrier	33%	Slope	1	0
CR143		Maddox Creek / Big Ditch	Barrier	0%	Tidegate	1	0
CR153		Unnamed	Barrier	33%	Tidegate	1	0
CR162		Unnamed	Barrier	Unknown	Tidegate	1	0
CR166		Unnamed	Barrier	Unknown	Unknown	1	0
CR70		Maddox Creek / Big Ditch	Barrier	0%	Tidegate	1	0
GN22		Unnamed	Unknown	Unknown	Unknown	1	0
GN38		Unnamed	Unknown	Unknown	Unknown	1	0
GR54	SR 20	Eagle Creek	Barrier	33%	Velocity	1	0
HC106		Skiyou Slough	Unknown	Unknown	Unknown	1	0
IL1		Obrian Creek	Barrier	Unknown	Debris	1	0
IL2		Marblegate Slough	Barrier	Unknown	Unknown	1	0
IL24		Lucas Slough	Unknown	Unknown	Unknown	1	0
IL4	private; Rockport Cascade	Obrian Slough	Barrier	67%	Slope	1	0
IL5		Obrian Slough	Unknown	Unknown	Unknown	1	0
IL6	Rockport Cascade Rd	Obrian Creek	Barrier	0%	Drop and Slope	1	0
JB.SRSC1	Clark Rd	Unnamed	Barrier	0%	Debris	1	0
JB.SRSC2	Clark Rd	Unnamed	Barrier	67%	Slope	1	0
LA2	S Skagit Hwy	Unnamed	Barrier	Unknown	Drop	1	0
LA5	South Skagit Highway	Nettles Pond	Barrier	67%	Drop	1	0
NC111		Unnamed	Barrier	33%	Tidegate	1	0
NC115		Unnamed	Barrier	67%	Velocity	1	0
NC123	Kulshon Trail	Unnamed	Unknown	Unknown	Insufficient Data	1	0
NC128	N 19th St	Kulshon Creek	Unknown	Unknown	Level B - Survey Needed	1	0
NC141		Unnamed	Barrier	33%	Tidegate	1	0
NC82	private; McLaughlin Rd	Unnamed	Unknown	Unknown	Insufficient Data	1	0
SF41	Burlington Blvd	Gages Slough	Unknown	Unknown	Level B - Survey Needed	1	0
SF43	Anacortes St	Gages Slough	Barrier	33%	Slope	1	0
SF45	E Rio Vista Blvd	Gages Slough	Barrier	67%	Slope	1	0
SF47	Monroe St	Gages Slough	Unknown	Unknown	Unknown	1	0
SF49	SR 20	Gages Slough	Barrier	33%	Slope	1	0
SF52	Peacock Rd	Gages Slough	Unknown	Unknown	Unknown	1	0
SF55	SR 20	Gages Slough	Unknown	Unknown	Level B - Awaiting Results	1	0

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SF61		Gages Slough	Unknown	Unknown	Unknown	1	0
920242	River Rd	Unnamed	Barrier	67%	Slope	1	
920285		Unnamed	Barrier	33%	Depth	1	
920306	Sharon St	Gages Slough	Unknown	Unknown	Insufficient Data	1	
920308	Hawthorne St	Gages Slough	Unknown	Unknown	Level B - Survey Needed	1	
920454	Cederdale Rd	Flowers Creek	Unknown	Unknown	Insufficient Data	1	
920732	Anderson Rd	Martha Washington Creek	Barrier	33%	Other	1	
932350	I-5	Kulshon Creek	Unknown	Unknown	Insufficient Data	1	
990885	SR 530	Unnamed	Barrier	Unknown	Depth	1	
991133	I-5	Unnamed	Unknown	Unknown	Insufficient Data	1	
991725	I-5	Maddox Creek / Big Ditch	Barrier	67%	Depth	1	
995224	I-5	Unnamed	Unknown	Unknown	Insufficient Data	1	
995225	I-5	Unnamed	Unknown	Unknown	Level B - Survey Needed	1	
995436	SR 20	Unnamed	Unknown	Unknown	Level B - Survey Needed	1	
997712	SR 530	Unnamed	Barrier	0%	Drop	1	
HCSFEG1	Bark Park	Unnamed	Barrier	67%	Slope	1	
IL14		Unnamed	Barrier	33%	Undersized	1	
NC118		Kulshon Creek	Unknown	Unknown	Level B - Survey Needed	1	
NC121	Parker Way	Kulshon Creek	Unknown	Unknown	Level B - Survey Needed	1	
NC122	18th St	Kulshon Creek	Barrier	33%	Slope	1	
NC124		Unnamed	Unknown	Unknown	Level B - Survey Needed	1	
NC125	Roosevelt Rd	Unnamed	Unknown	Unknown	Level B - Survey Needed	1	
SF71	SR 20	Brickyard Creek	Unknown	Unknown	Level B - Survey Needed	1	
TC4	FR 26 Rd	Doe Creek	Barrier	67%	Slope	2	284
DM2		Babcock Creek	Unknown	Unknown	Level B - Survey Needed	2	226
FC8	CP 1400 Rd	Unnamed	Barrier	Unknown	Slope	2	0
600049	forest road; SR 20	Unnamed	Barrier	67%	Depth	2	
600050	forest road; SR 20	Unnamed	Barrier	0%	Slope	2	
600051	forest road; SR 20	Unnamed	Barrier	67%	Slope	2	
600052	forest road; SR 20	Unnamed	Unknown	Unknown	Level B - Survey Needed	2	
932472	SR 20	Unnamed	Unknown	Unknown	Level B - Survey Needed	2	
994947	SR 20	Unnamed	Barrier	0%	Drop	2	

Table 2: Barrier and Unknown Culverts on Known and Modeled Steelhead Streams

Barrier Status:

Barriers	Unknown Barrier Status
205	38

Weighted Habitat Area (Smith and Waldo 2003)

> 10,000 M ²	1,000 to 10,000 M ²	200 to 1,000 M ²	0 to 200 M ²	0 M ²	No Habitat Estimates Available
11	49	60	61	62	0

Owner Type:

County	Private	Other Public
89	152	2

Individual Details for Culverts (n = 243):

Site ID	Road	Stream	Barrier Status	% Passability	Barrier Reason	Steelhead Presence	SWC Tier	Weighted Habitat Area M ²
NC9	Challenge Rd	Klahowya Creek	Barrier	67%	Slope	Yes	Tier 3	111,454
IL20		Barnaby Slough	Unknown	Unknown	Insufficient Data	Yes	Tier 1	73,932
NC136	Mountain View Rd	Unnamed	Barrier	67%	Velocity	Yes	Tier 3	52,298
HC14		Unnamed	Barrier	33%	Depth	Yes	Tier 3	39,273
AR39	Pettit Rd	Careys Slough	Unknown	Unknown	Level B - Slough	Yes	Tier 1	33,143
AR26		Careys Creek	Barrier	67%	Velocity	Yes	Tier 1	23,710
CR131		Unnamed	Barrier	33%	Slope	Yes	Tier 3	21,380
IL11	Martin Ranch Rd	Unnamed	Barrier	67%	Drop and Slope	Yes	Tier 1	19,810
AR9	Hamilton Cemetary Rd	Red Cabin Creek	Barrier	33%	Velocity	Yes	Tier 3	19,654
SF104	Bassett Rd	Unnamed	Barrier	33%	Drop and Slope	Yes	Tier 0	17,907
03.0181 0.55	Cedardale Rd	Fisher Creek	Barrier	67%	Drop	Yes	Tier 3	12,924
CR26	Cascade Ridge Rd	Carpenter Creek	Barrier	33%	Velocity	Yes	Tier 3	8,745
CR96	private; Pioneer Hwy	Maddox Creek / Big Ditch	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 1	8,668
MO4	Mountain Loop Hwy	Unnamed	Barrier	Unknown	Slope	Yes	Tier 3	7,463
IL26	Martin Rd	Martin Slough	Barrier	0%	Slope	Yes	Tier 1	7,376
03.0181 2.45	Starbird Rd	Fisher Creek	Barrier	67%	Drop	Yes	Tier 3	7,158
NC6		Klahowya Creek	Barrier	67%	Slope	Yes	Tier 3	6,925
IL12	Martin Ranch Rd	Unnamed	Barrier	67%	Drop and Slope	Yes	Tier 1	6,324
03.0181 4.84	private; 36th Ave NW	Fisher Creek	Barrier	67%	Depth	Yes	Tier 3	5,974
SP4		Green Creek	Barrier	67%	Drop	Yes	Tier 1	5,620
CR196		Starbird Creek	Barrier	33%	Velocity	Yes	Tier 3	4,906
GN18	S Skagit Hwy	Gilligan Creek	Barrier	33%	Slope	Yes	Tier 1	4,729
DC2		Mouse Creek	Barrier	Unknown	Slope	Yes	Tier 1	4,530
NC89		Trumpeter Creek	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	4,521
NC60		Cold Springs Creek	Barrier	67%	Slope	Yes	Tier 3	4,498
MO5	Mountain Loop Hwy	Unnamed	Barrier	Unknown	Drop	Yes	Tier 3	4,384
992698	private	Maddox Creek / Big Ditch	Barrier	Unknown	Depth	Yes	Tier 1	4,173
CR142	Bulson Rd	Bulson Creek	Barrier	33%	Slope	Yes	Tier 3	3,337
CR84	Brandstrom Rd	Fisher Creek	Barrier	Unknown	Depth	Yes	Tier 3	2,884
SP10		Everett Creek	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	2,783
933794	Debays Isle Road	Debays Slough	Unknown	Unknown	Level B - Slough	Yes	Tier 1	2,721
931695		Careys Creek	Barrier	67%	Velocity	Yes	Tier 1	2,511
920330	Helen Dr	Unnamed	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	2,456
HC63	Unnamed	Unnamed	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	2,343
04.0434A 0.00	Dalles Rd	Lorenzan Creek	Barrier	67%	Drop	Yes	Tier 1	2,040
HC16		Unnamed	Barrier	67%	Slope	Yes	Tier 3	1,982
999792		Unnamed	Barrier	33%	Drop	Yes	Tier 3	1,960
NC10	Klahowya Rd	Klahowya Creek	Barrier	67%	Slope	Yes	Tier 3	1,909
PN5		Unnamed	Barrier	Unknown	Slope	Yes	Tier 3	1,887
JB38	South Cascade Rd	Clark Creek	Barrier	33%	Slope	Yes	Tier 1	1,884
1320286	BPA;Walker Valley Rd	Walker Creek East Fork	Barrier	67%	Drop	Yes	Tier 3	1,860
04.0675 0.54	Concrete-Sauk Valley Rd	Rudd Creek	Barrier	33%	Drop	Yes	Tier 1	1,844
GN35		Unnamed	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 1	1,791
03.0182 1.85		Milltown Creek	Barrier	67%	Velocity and Depth	Yes	Tier 3	1,738
AR8	Hamilton Cemetery Rd	Mannser Creek	Barrier	33%	Slope	Yes	Tier 3	1,724
RC4	Concrete Sauk Valley Rd.	Hobbit Creek	Barrier	0%	Drop and Slope	Yes	Tier 1	1,546
CR58	Clarence Lane	Unnamed	Barrier	67%	Slope	Yes	Tier 3	1,446
GN16	South Skagit Highway	Sorenson Creek	Barrier	0%	Drop and Slope	Yes	Tier 3	1,311
RC5	Concrete-Sauk Valley Rd	Osterman Creek	Barrier	0%	Drop and Slope	Yes	Tier 1	1,293
990608	Pioneer Hwy	Unnamed	Barrier	0%	Velocity	Yes	Tier 3	1,281
HC88	Pipeline Rd	Pipeline Creek	Barrier	0%	Drop and Slope	Yes	Tier 3	1,262
NC147	Otter Pond Rd	Unnmed	Barrier	33%	Drop	Yes	Tier 3	1,259
HC110	Hoehn Rd	Unnmed	Barrier	67%	Depth	Yes	Tier 1	1,174
GR18	Concrete Sauk Valley Rd	Lorenzan Creek	Barrier	33%	Velocity	Yes	Tier 3	1,162
CR100	Private drive off Little Mountain	Carpenter Creek	Barrier	33%	Drop	Yes	Tier 3	1,115
03.0196 0.10	324th St NW	Unnmed	Barrier	33%	Depth	Yes	Tier 3	1,098
NC74	farm rd; SR 9	Gribble Creek	Barrier	67%	Depth	Yes	Tier 3	1,093
AR4	pvt; Hamilton Cemetary Rd	Unnmed	Barrier	33%	Slope	Yes	Tier 3	1,080
HC44		Unnmed	Barrier	Unknown	Unknown	Yes	Tier 3	1,063
NC120		Kulshon Creek	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 1	1,035
932312		Unnmed	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	922
GN19	South Skagit Highway	Stevens Creek	Barrier	33%	Slope	Yes	Tier 3	889
03.0183 1.20	Starbird Road	Unnmed	Barrier	0%	Drop and Slope	Yes	Tier 3	836
IL25	Martin Rd	Unnmed	Unknown	Unknown	Level B - Slough	Yes	Tier 1	827
999103	private	Fisher Creek	Barrier	67%	Velocity	Yes	Tier 3	803
CR66	Countyline Rd	Unnmed	Barrier	Unknown	Unknown	Yes	Tier 3	776
HC103		Unnmed	Barrier	Unknown	Undersized	Yes	Tier 3	737
JB25	Rockport Cascade Rd	Clark Creek	Barrier	67%	Slope	Yes	Tier 1	734
MO1		Skull Creek	Barrier	Unknown	Slope	Yes	Tier 3	717
NC88	private	Trumpeter Creek	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	717
CR197		Unnmed	Barrier	33%	Slope	Yes	Tier 3	702
IL9	Rockport Cascade Rd	Unnmed	Barrier	33%	Drop	Yes	Tier 3	659
CR188	Cascade Ridge Rd	Unnmed	Barrier	67%	Drop and Slope	Yes	Tier 3	622
NC75	private; Mt View Rd	Gribble Creek	Barrier	33%	Slope	Yes	Tier 3	614
SF92		Brickyard Creek	Unknown	Unknown	Unknown	Yes	Tier 3	611
930848		Unnmed	Barrier	67%	Drop	Yes	Tier 3	596
991913	private; English Rd	Unnmed	Barrier	0%	Drop	Yes	Tier 3	596
930829		Unnmed	Barrier	33%	Slope	Yes	Tier 3	585
NC217		Gribble Creek	Barrier	67%	Slope	Yes	Tier 3	580
SF107		Willard Creek	Barrier	Unknown	Drop	Yes	Tier 0	547
HC91	Fruitdale Rd	Unnmed	Barrier	0%	Slope	Yes	Tier 3	536
IL10	Rockport Cascade Rd	Unnmed	Barrier	67%	Slope	Yes	Tier 3	517
SF99		Brickyard Creek	Barrier	Unknown	Unknown	Yes	Tier 3	517
04.0659 0.31	Concrete Sauk Valley	Aldon Creek	Barrier	33%	Drop	Yes	Tier 3	487
ILSRSC1	Rockport Cascade Rd.	Unnmed	Barrier	67%	Slope	Yes	Tier 3	485
930950		Unnmed	Barrier	33%	Other	Yes	Tier 3	482
991915	private; English Rd	Unnmed	Barrier	0%	Slope	Yes	Tier 3	477
SP8	Private Road	Everett Lake	Barrier	33%	Velocity	Yes	Tier 3	449
03.0183 0.10	Franklin Rd	Unnmed	Barrier	33%	Drop	Yes	Tier 3	437
SP16	Sauk Prairie Rd	Dutch Creek	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	437
GN8		Unnmed	Unknown	Unknown	Unknown	Yes	Tier 3	422
SP1	E Sauk Prarie Rd	Prairie Creek	Barrier	0%	Drop and Slope	Yes	Tier 3	406

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NC41		Cold Springs Creek	Barrier	33%	Slope	Yes	Tier 3	360	
920345		Trumpeter Creek	Barrier	0%	Slope	Yes	Tier 3	358	
HC65		Unnamed	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	347	
DC5		Mouse Creek	Unknown	Unknown	Unknown	Yes	Tier 3	346	
CR128	Little Mountain Road	Carpenter Creek	Barrier	33%	Velocity	Yes	Tier 3	340	
HC108	Duffy	Unnamed	Barrier	33%	Drop	Yes	Tier 3	329	
930824		Unnamed	Barrier	33%	Drop	Yes	Tier 3	313	
03.0183	0.70	Bonnieview Lane	Unnamed	Barrier	33%	Velocity and Depth	Yes	Tier 3	311
CR141	Private;Little Mt Rd	English Creek	Barrier	67%	Drop	Yes	Tier 3	301	
CD5	Sauk City Rd	Unnamed	Barrier	0%	Drop	Yes	Tier 3	293	
FC14	Cedar Grove Rd	Unnamed	Unknown	Unknown	Level B - Slough	Yes	Tier 1	289	
992697	farm access rd	Maddox Creek / Big Ditch	Barrier	67%	Slope	Yes	Tier 1	287	
JB22	Cascade Ridge Rd	Unnamed	Barrier	67%	Velocity and Depth	Yes	Tier 3	286	
HC58	Cordy Ln	Unnamed	Barrier	33%	Slope	Yes	Tier 3	284	
SP17		Unnamed	Unknown	Unknown	Unknown	Yes	Tier 3	284	
982757		Unnamed	Barrier	0%	Other	Yes	Tier 1	277	
NC70	Cultus Ct	Gribble Creek	Barrier	67%	Slope	Yes	Tier 3	274	
HC64		Unnamed	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	268	
HC87	Pipeline Rd	Pipeline Creek	Barrier	33%	Slope	Yes	Tier 3	261	
SF108		Unnamed	Barrier	67%	Slope	Yes	Tier 3	258	
999772		Unnamed	Barrier	67%	Slope	Yes	Tier 3	245	
CR77	Bulson Rd	Starbird Creek	Barrier	33%	Other	Yes	Tier 3	244	
HC94	Parker Rd	Unnamed	Barrier	0%	Drop	Yes	Tier 3	244	
933580	Cedardale Road	Unnamed	Barrier	33%	Depth	Yes	Tier 1	238	
GR17	Concrete Rd	Lorenzan Creek	Barrier	67%	Velocity	Yes	Tier 3	230	
CC11	Clear Creek Rd	Unnamed	Barrier	0%	Drop	Yes	Tier 3	228	
ILSRSC2			Barrier	33%	Slope	Yes	Tier 1	210	
03.0280	0.00	Utopia Rd	Wiseman Creek	Barrier	0%	Tidegate	Yes	Tier 1	204
933581	unnamed	Unnmad	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 1	200	
CD4	Sauk City Rd	Unnamed	Barrier	33%	Slope	Yes	Tier 3	199	
HC62	Minkler Rd	Little Coal Creek	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	198	
JB31	Fish Hatchery Ln	Hatchery Creek	Barrier	Unknown	Undersized	Yes	Tier 1	196	
930870		Unnamed	Barrier	67%	Drop	Yes	Tier 3	195	
991914	private; English Rd	Unnamed	Barrier	0%	Drop	Yes	Tier 3	190	
CR88		Unnamed	Barrier	33%	Slope	Yes	Tier 3	182	
995338	East Conway Hill Lane	Unnamed	Barrier	0%	Slope	Yes	Tier 3	175	
JB34	Clark Rd	Clark Creek	Barrier	67%	Velocity	Yes	Tier 1	174	
DB3	Dexter Ln	Unnamed	Barrier	33%	Slope	Yes	Tier 3	169	
SF110	access rd; Fruitdale Rd		Barrier	67%	Drop	Yes	Tier 3	158	
DC14	N Sauk River Rd	Unnamed	Barrier	Unknown	Slope	Yes	Tier 1	155	
GR44	Challenger Rd	Ebing Creek	Barrier	0%	Drop	Yes	Tier 3	140	
CR140	Private - farm access	English Creek	Barrier	33%	Velocity and Depth	Yes	Tier 3	136	
CR76	Starbird Rd	Unnamed	Barrier	0%	Slope	Yes	Tier 3	134	
132101923	Private;Sauk Store Rd	Unnamed	Barrier	0%	Slope	Yes	Tier 3	130	
HC85	Pipeline Rd	Pipeline Creek	Barrier	67%	Velocity	Yes	Tier 3	130	
CR136	Ervine Lane	Carpenter Creek	Barrier	33%	Slope	Yes	Tier 3	120	
JB20	Cascade Ridge Rd	Unnamed	Barrier	67%	Velocity and Slope	Yes	Tier 1	115	
920341		Trumpeter Creek	Barrier	0%	Slope	Yes	Tier 3	112	
930823		Unnamed	Barrier	33%	Drop	Yes	Tier 3	111	
GR40	Challenger Rd	Unnamed	Barrier	0%	Slope	Yes	Tier 3	107	
931570	Cascade Trail	Eagle Creek	Barrier	0%	Drop	Yes	Tier 3	99	
03.0181	5.76	English Grade Rd	Fisher Creek	Barrier	33%	Drop	Yes	Tier 3	97
995416		Unnamed	Barrier	67%	Slope	Yes	Tier 3	84	
CR67	Haugen	Unnmad	Barrier	33%	Drop and Slope	Yes	Tier 3	82	
HC66		Unnamed	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	79	
931899		Unnamed	Barrier	67%	Slope	Yes	Tier 3	78	
GR39	Piscatore Ln	Unnamed	Barrier	33%	Undersized	Yes	Tier 1	78	
930935		Unnamed	Barrier	33%	Slope	Yes	Tier 3	77	
994219	private	Unnamed	Barrier	33%	Undersized	Yes	Tier 3	73	
920343		Trumpeter Creek	Barrier	0%	Slope	Yes	Tier 3	72	
HC92	Mosier Rd	Unnmad	Barrier	0%	Slope	Yes	Tier 3	66	
930827		Unnamed	Barrier	33%	Slope	Yes	Tier 3	65	
920342		Trumpeter Creek	Barrier	0%	Slope	Yes	Tier 3	58	
931571		Eagle Creek	Barrier	0%	Drop	Yes	Tier 3	56	
999104		Fisher Creek	Barrier	33%	Slope	Yes	Tier 3	54	
DC8		Unnamed	Barrier	Unknown	Unknown	Yes	Tier 3	54	
JB16		Boulder Creek	Barrier	Unknown	Unknown	Yes	Tier 1	50	
920300		Martha Washington Creek	Unknown	Unknown	Insufficient Data	Yes	Tier 1	43	
995337	East Conway Hill Lane	Unnmad	Barrier	33%	Slope	Yes	Tier 3	37	
930822		Unnamed	Barrier	0%	Slope	Yes	Tier 3	34	
CD2		Unnamed	Unknown	Unknown	Unknown	Yes	Tier 1	34	
HC90	Pipeline Rd	Unnmad	Barrier	33%	Drop and Slope	Yes	Tier 3	34	
JB35	Clark Rd	Clark Creek	Barrier	67%	Drop	Yes	Tier 1	34	
JB5	E Cascade Dr	Day Creek	Barrier	Unknown	Drop	Yes	Tier 3	34	
931896		Unnamed	Barrier	33%	Other	Yes	Tier 3	32	
HC55		Unnamed	Barrier	33%	Slope	Yes	Tier 3	32	
HC54		Unnamed	Barrier	33%	Slope	Yes	Tier 3	31	
NC212		Norway Park Creek	Barrier	67%	Slope	Yes	Tier 3	31	
NC213	Pavilion Drive	Norway Park Creek	Barrier	0%	Drop and Slope	Yes	Tier 3	28	
930826		Unnamed	Barrier	0%	Slope	Yes	Tier 3	27	
GR55	Unnamed	Ebing Creek	Barrier	0%	Drop	Yes	Tier 3	23	
930934		Unnamed	Barrier	0%	Slope	Yes	Tier 3	20	
930828		Unnamed	Barrier	33%	Drop	Yes	Tier 3	17	
SF98	Fruitdale Rd	Brickyard Creek	Barrier	Unknown	Unknown	Yes	Tier 3	17	
HC57		Unnamed	Barrier	67%	Slope	Yes	Tier 3	16	
920302		Martha Washington Creek	Barrier	33%	Slope	Yes	Tier 3	12	
03.0266	0.00	Brickyard Creek	Barrier	67%	Drop	Yes	Tier 1	11	
HC72	Lyman-Hamilton Rd	Unnmad	Barrier	67%	Slope	Yes	Tier 3	5	
HC51		Unnamed	Barrier	0%	Drop	Yes	Tier 3	1	
03.0196	0.68	Pleasant Hill Rd	Unnmad	Barrier	0%	Drop	Yes	Tier 3	0
04.0373	0.10	S Skagit Hwy	Unnmad	Barrier	33%	Slope	Yes	Tier 3	0
994213	Sauk Connection Rd	Unnmad	Barrier	33%	Slope	Yes	Tier 3	0	
AR33	Crown Pacific 800 Rd	Unnmad	Unknown	Unknown	Unknown	Yes	Tier 3	0	
AR34	Crown Pacific 800 Rd	Unnmad	Barrier	Unknown	Drop	Yes	Tier 3	0	
AR35	Crown Pacific 800 Rd	Unnmad	Barrier	Unknown	Other	Yes	Tier 3	0	
AR36	Crown Pacific 800 Rd	Unnmad	Barrier	Unknown	Drop	Yes	Tier 1	0	
AR37	Crown Pacific 800 Rd	Unnmad	Barrier	Unknown	Drop	Yes	Tier 3	0	
CC10	Mountain Loop Hwy	Unnmad	Barrier	67%	Slope	Yes	Tier 3	0	
CR144	Logen Rd	Unnmad	Unknown	Unknown	Unknown	Yes	Tier 3	0	
CR153		Unnamed	Barrier	33%	Tidegate	Yes	Tier 1	0	
CR162		Unnmad	Barrier	Unknown	Tidegate	Yes	Tier 1	0	
CR166		Unnmad	Barrier	Unknown	Unknown	Yes	Tier 1	0	
CR201	private; English Rd	Unnmad	Barrier	33%	Drop	Yes	Tier 3	0	
CR216	Pacific Hwy	Unnmad	Barrier	Unknown	Slope	Yes	Tier 3	0	
CR219	Detting Rd	Unnmad	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	0	
CR220		Unnmad	Barrier	Unknown	Drop	Yes	Tier 3	0	
CR222		Unnmad	Barrier	Unknown	Slope	Yes	Tier 3	0	
CR225		Unnmad	Barrier	Unknown	Tidegate	Yes	Tier 3	0	
CR72		Unnmad	Barrier	Unknown	Drop	Yes	Tier 3	0	
CR80	Starbird Rd	Unnmad	Barrier	0%	Drop	Yes	Tier 3	0	
DC9	Sauk Prairie Rd crossing	Unnmad	Barrier	Unknown	Slope	Yes	Tier 3	0	
GN22		Unnmad	Unknown	Unknown	Unknown	Yes	Tier 1	0	
GN38		Unnmad	Unknown	Unknown	Unknown	Yes	Tier 1	0	
GR29	Tyee Dr	Unnmad	Barrier	Unknown	Other	Yes	Tier 3	0	
HC106		Skiyou Slough	Unknown	Unknown	Unknown	Yes	Tier 1	0	
HC18		Unnmad	Unknown	Unknown	Unknown	Yes	Tier 3	0	
HC19		Unnmad	Barrier	Unknown	Drop	Yes	Tier 3	0	

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HC20		Unnamed	Barrier	Unknown	Unknown	Yes	Tier 3	0
HC70		Unnamed	Barrier	Unknown	Drop	Yes	Tier 3	0
HC71		Unnamed	Barrier	Unknown	Drop	Yes	Tier 3	0
HC86	Pipeline Rd	Pipeline Creek	Barrier	0%	Drop and Slope	Yes	Tier 3	0
IL1		Obrian Creek	Barrier	Unknown	Debris	Yes	Tier 1	0
IL2		Marblegate Slough	Barrier	Unknown	Unknown	Yes	Tier 1	0
IL4	private; Rockport Cascade	Obrian Slough	Barrier	67%	Slope	Yes	Tier 1	0
IL6	Rockport Cascade Rd	Obrian Creek	Barrier	0%	Drop and Slope	Yes	Tier 1	0
JB.SRSC1	Clark Rd	Unnamed	Barrier	0%	Debris	Yes	Tier 1	0
JB.SRSC2	Clark Rd	Unnamed	Barrier	67%	Slope	Yes	Tier 1	0
JB11	E Cascade Dr	Unnamed	Barrier	Unknown	Slope	Yes	Tier 3	0
JB12	E Cascade Dr	Unnamed	Barrier	Unknown	Other	Yes	Tier 3	0
LA11	South Skagit Hwy	Unnamed	Barrier	0%	Slope	Yes	Tier 3	0
LA2	S Skagit Hwy	Unnamed	Barrier	Unknown	Drop	Yes	Tier 1	0
MO7	Mountain Loop Hwy	Unnamed	Barrier	Unknown	Slope	Yes	Tier 3	0
NC111		Unnamed	Barrier	33%	Tidegate	Yes	Tier 1	0
NC115		Unnamed	Barrier	67%	Velocity	Yes	Tier 1	0
NC12		Klahowya Creek	Barrier	67%	Slope	Yes	Tier 3	0
NC13	Challenge Rd	Unnamed	Barrier	67%	Slope	Yes	Tier 3	0
NC141		Unnamed	Barrier	33%	Tidegate	Yes	Tier 1	0
NC143		Unnamed	Barrier	67%	Undersized	Yes	Tier 3	0
NC196		Unnamed	Barrier	33%	Drop	Yes	Tier 3	0
NC211		Unnamed	Barrier	0%	Slope	Yes	Tier 3	0
NC82	private; McLaughlin Rd	Unnamed	Unknown	Unknown	Insufficient Data	Yes	Tier 1	0
PN11		Unnamed	Barrier	Unknown	Unknown	Yes	Tier 3	0
RC6	Concrete-Sauk Valley Rd	Osterman Creek East	Barrier	33%	Drop and Slope	Yes	Tier 3	0
SF109		Unnamed	Barrier	33%	Slope	Yes	Tier 3	0
SF112	Fredrickson Rd	Unnamed	Barrier	67%	Slope	Yes	Tier 0	0
SF114	Fredrickson Rd	Unnamed	Barrier	33%	Drop	Yes	Tier 0	0
SF115		Unnamed	Barrier	33%	Drop	Yes	Tier 0	0
SF52	Peacock Rd	Gages Slough	Unknown	Unknown	Unknown	Yes	Tier 1	0
SF61		Gages Slough	Unknown	Unknown	Unknown	Yes	Tier 1	0
SP6		Green Creek	Unknown	Unknown	Unknown	Yes	Tier 3	0
XID1470	Sauk Prairie Rd	Unnamed	Unknown	Unknown	Level B - Survey Needed	Yes	Tier 3	0

APPENDIX C: Baker River and Downstream Areas

Overview

A portion of the funding for the Skagit Barrier Culvert Analysis came from Puget Sound Energy through the Baker Hydroelectric Project Aquatic Riparian Habitat SA 505 process (PSE 2010). The main objective of this funding was to identify potential barrier projects in the geographic area that includes the Baker River watershed and the middle Skagit River (and tributaries) immediately downstream of the Baker River to the pipeline crossing at River Mile 24.3 (Figure 1). Methods for initial list development, barrier and habitat surveys, and GIS habitat estimates all follow those described in the main body of the Skagit Basin Barrier Culvert Analysis, but we have further narrowed the study area here to this region.

For this project, a crew from the Upper Skagit Indian Tribe conducted barrier surveys at 9 sites within the Baker River Watershed, and our partner organizations surveyed an additional 42 sites in the middle Skagit reach. Coupled with surveys by WDFW, a total of 104 barrier and unknown culverts are present within the study area for the grant (Figure 2). We present here a list of culvert crossings within the Baker River/Middle Skagit study area, first sorted by GIS-derived upstream habitat area, and next by Priority Index calculated from physical habitat surveys.

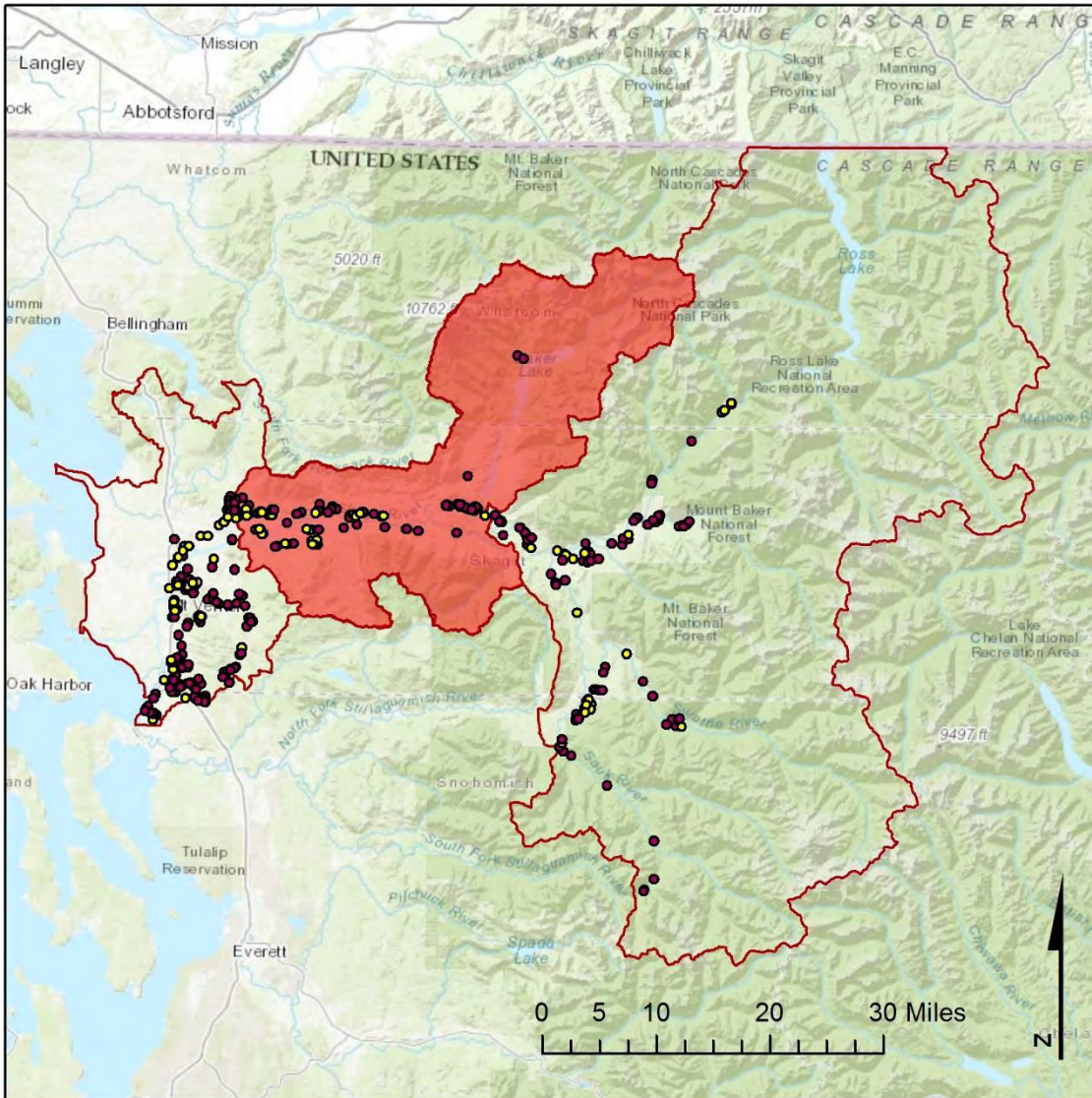


Figure 1. Geographic study area for the Baker Hydroelectric Project Aquatic Riparian Habitat SA 505 process. Baker River watershed and Middle Skagit tributary watersheds are highlighted in red within the broader Skagit River Basin. Barrier and Unknown culvert distribution for the overall Skagit Basin is shown.

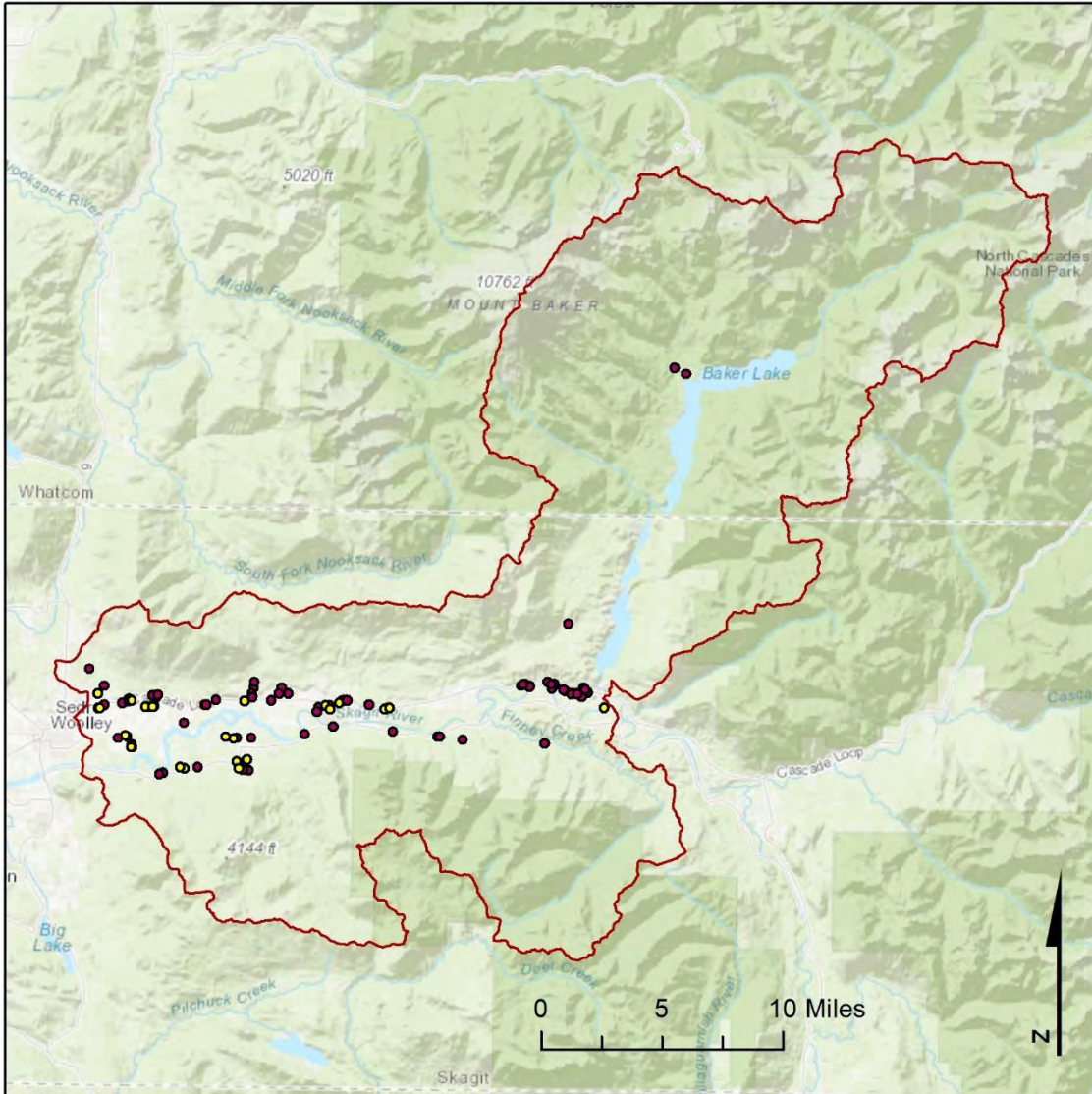


Figure 2. Barrier and Unknown culverts within the Baker River and downstream Middle Skagit study area. There are a total of 104 barrier and unknown culverts in this area (Barriers: 77, Unknown = 27).

RESULTS

GIS-Derived Upstream Habitat Estimates

Estimates of habitat area that could be made available upstream of each barrier culvert within the Baker/Middle Skagit study area were taken from Smith and Waldo (2003) or were developed for the purpose of this analysis using similar methods, so this information is available for 86 of 104 barrier or unknown culverts, including all County and private culverts. These estimates are provided for each culvert upstream to the next natural or artificial (human made) barrier.

Of the 104 barrier and unknown culverts within our study area, 35 are County owned, 42 are privately owned, and 27 are under other public ownership. Four culverts have weighted habitat area estimates greater than 10,000 m², 19 have between 1,000 and 10,000 m², 16 have 200 to 1,000 m², and 18 have from 0 to 200 m². An additional 29 culverts showed no upstream habitat, and no habitat estimates were available for 18 culverts.

[See Appendix C, Table 1]

Field-Based Upstream Habitat Surveys

Collectively, our group completed habitat assessments for 11 sites in the Baker/Middle Skagit study area. Together with surveys conducted by WDFW and other groups, a total of 31 sites in the study area have physical habitat survey data available. For each of these sites, we calculated Priority Index values for habitat from a given crossing upstream to the end of potential habitat, i.e. to the natural fish barrier, regardless of whether other blocking crossings were present. Spawning area, rearing area, and lineal gain are also shown. Sites for which a physical habitat survey has not yet been conducted are left off of this list.

[See Appendix C, Table 2]

REFERENCES

Puget Sound Energy. 2010. Aquatic Riparian Habitat Protection, Restoration, and Enhancement Plan. Baker River Hydroelectric Project, FERC No. 2150. Bellevue, Washington.

Table 1: Habitat Estimates for Barrier and Unknown Culverts in the Baker/Middle Skagit Study Area

Barrier Status:

Barriers	Unknown Barrier Status
77	27

Weighted Habitat Area (Smith and Waldo 2003)

> 10,000 M ²	1,000 to 10,000 M ²	200 to 1,000 M ²	0 to 200 M ²	0 M ²	No Habitat Estimates Available
4	19	16	18	29	18

Owner Type:

County	Private	Other Public
35	42	27

Individual Details for Culverts (n = 104):

Site ID	Road	Stream	Barrier Status	% Passability	Barrier Reason	Weighted Habitat
HC14		Unnamed	Barrier	33%	Depth	39,273
AR39	Pettit Rd	Careys Slough	Unknown	Unknown	Level B - Slough	33,143
AR26		Careys Creek	Barrier	67%	Velocity	23,710
AR9	Hamilton Cemetary Rd	Red Cabin Creek	Barrier	33%	Velocity	19,654
03.0279 0.10	Hoehn Rd	Coal Creek	Unknown	Unknown	Level B - Awaiting Results	8,564
GN18	S Skagit Hwy	Gilligan Creek	Barrier	33%	Slope	4,729
931695		Careys Creek	Barrier	67%	Velocity	2,511
HC63	Unnamed	Unnamed	Unknown	Unknown	Level B - Survey Needed	2,343
04.0434A 0.00	Dalles Rd	Lorenzan Creek	Barrier	67%	Drop	2,040
HC16		Unnamed	Barrier	67%	Slope	1,982
HC41	footpath @ N. State	Dairy Creek	Unknown	Unknown	Level B - Survey Needed	1,893
PN5	Unnamed	Unnamed	Barrier	Unknown	Slope	1,887
GN35	Unnamed	Unnamed	Unknown	Unknown	Level B - Survey Needed	1,791
AR8	Hamilton Cemetery Rd	Mannser Creek	Barrier	33%	Slope	1,724
GN.SFEG1	NA - Private Farm road	Day Creek Slough	Barrier	Unknown	Judgement Call - See Notes	1,707
HC109	Duffy	Unnamed	Barrier	33%	Drop	1,647
GN16	South Skagit Highway	Sorenson Creek	Barrier	0%	Drop and Slope	1,311
GR22	Superior Ave	Lorenzan Creek	Barrier	33%	Slope	1,281
HC88	Pipeline Rd	Pipeline Creek	Barrier	0%	Drop and Slope	1,262
HC110	Hoehn Rd	Unnamed	Barrier	67%	Depth	1,174
GR18	Concrete Sauk Valley Rd	Lorenzan Creek	Barrier	33%	Velocity	1,162
AR4	pvt; Hamilton Cemetary Rd	Unnamed	Barrier	33%	Slope	1,080
HC44		Unnamed	Barrier	Unknown	Unknown	1,063
932312		Unnamed	Unknown	Unknown	Level B - Survey Needed	922
GN19	South Skagit Highway	Stevens Creek	Barrier	33%	Slope	889
HC103		Unnamed	Barrier	Unknown	Undersized	737
03.0278 0.10	Hoehn Rd	Fender Creek	Barrier	0%	Slope	692
GN8	Unnamed	Unnamed	Unknown	Unknown	Unknown	422
HC65		Unnamed	Unknown	Unknown	Level B - Survey Needed	347
HC108	Duffy	Unnamed	Barrier	33%	Drop	329
FC14	Cedar Grove Rd	Unnamed	Unknown	Unknown	Level B - Slough	289
HC64		Unnamed	Unknown	Unknown	Level B - Survey Needed	268
HC87	Pipeline Rd	Pipeline Creek	Barrier	33%	Slope	261
HC.SKCO5	Cokedale Ln	Dairy Creek	Barrier	0%	Drop and Slope	256
HC94	Parker Rd	Unnamed	Barrier	0%	Drop	244
GR17	Concrete Rd	Lorenzan Creek	Barrier	67%	Velocity	230
GR23	SR 20	Lorenzan Creek	Barrier	0%	Slope	227
03.0339A 0.10	abandoned	Unnamed	Barrier	0%	Velocity	211
03.0280 0.00	Utopia Rd	Wiseman Creek	Barrier	0%	Tidegate	204
HC62	Minkler Rd	Little Coal Creek	Unknown	Unknown	Level B - Survey Needed	198
MB8		Little Park Creek	Barrier	33%	Slope	173
GR44	Challenger Rd	Ebing Creek	Barrier	0%	Drop	140
HC85	Pipeline Rd	Pipeline Creek	Barrier	67%	Velocity	130
GR9	SR 20	Fish Creek	Barrier	33%	Velocity	117
GR10	Cascade Trail	Fish Creek	Barrier	67%	Depth	112
GR40	Challenger Rd	Unnamed	Barrier	0%	Slope	107
931570	Cascade Trail	Eagle Creek	Barrier	0%	Drop	99
HC66		Unnamed	Unknown	Unknown	Level B - Survey Needed	79
GR39	Piscatore Ln	Unnamed	Barrier	33%	Undersized	78
GN4	Unnamed	Unnamed	Unknown	Unknown	Unknown	59
931571		Eagle Creek	Barrier	0%	Drop	56
GN14		Unnamed	Barrier	Unknown	Debris	47
HC90	Pipeline Rd	Unnamed	Barrier	33%	Drop and Slope	34
GN3	Potts Rd	Unnamed	Barrier	67%	Slope	27
995440	Cascade Trail	Unnamed	Barrier	33%	Slope	26
GR55	Unnamed	Ebing Creek	Barrier	0%	Drop	23
HC72	Lyman-Hamilton Rd	Unnamed	Barrier	67%	Slope	5
04.0373 0.10	S Skagit Hwy	Unnamed	Barrier	33%	Slope	0
AR25	1st St	Careys Creek	Barrier	67%	Velocity	0
AR28	Lyman Hamilton Rd	Careys Creek	Unknown	Unknown	Level B - Slough	0
AR33	Crown Pacific 800 Rd	Unnamed	Unknown	Unknown	Unknown	0
AR34	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	Drop	0
AR35	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	Other	0
AR36	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	Drop	0
AR37	Crown Pacific 800 Rd	Unnamed	Barrier	Unknown	Drop	0
FC8	CP 1400 Rd	Unnamed	Barrier	Unknown	Slope	0
GN12		Unnamed	Unknown	Unknown	Unknown	0
GN22		Unnamed	Unknown	Unknown	Unknown	0
GN38		Unnamed	Unknown	Unknown	Unknown	0
GN6	Private;Potts Rd	Unnamed	Barrier	33%	Slope	0
GR29	Tyee Dr	Unnamed	Barrier	Unknown	Other	0
GR54	SR 20	Eagle Creek	Barrier	33%	Velocity	0
HC106		Skiyou Slough	Unknown	Unknown	Unknown	0
HC120	SR 20	Unnamed	Unknown	Unknown	Unknown	0
HC121	SR 20	Unnamed	Unknown	Unknown	Unknown	0
HC18		Unnamed	Unknown	Unknown	Unknown	0
HC19		Unnamed	Barrier	Unknown	Drop	0
HC20		Unnamed	Barrier	Unknown	Unknown	0

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HC70		Unnamed	Barrier	Unknown	Drop	0
HC71		Unnamed	Barrier	Unknown	Drop	0
HC86	Pipeline Rd	Pipeline Creek	Barrier	0%	Drop and Slope	0
LA11	South Skagit Hwy	Unnamed	Barrier	0%	Slope	0
LA2	S Skagit Hwy	Unnamed	Barrier	Unknown	Drop	0
LA5	South Skagit Highway	Nettles Pond	Barrier	67%	Drop	0
MB7	USFS 11	Unnamed	Barrier	33%	Drop	0
PN11		Unnamed	Barrier	Unknown	Unknown	0
931354		Lorenzan Creek	Barrier	33%	Slope	
931355	Limestone St	Lorenzan Creek	Barrier	0%	Drop	
931579	Main St	Lorenzan Creek	Barrier	0%	Slope	
991123	SR 20	Unnamed	Barrier	33%	Velocity	
991142	SR 20	Unnamed	Barrier	67%	Slope	
991143	SR 20	Unnamed	Unknown	Unknown	Insufficient Data	
991146	SR 20	Childs Creek	Barrier	67%	Velocity	
991148	SR 20	Unnamed	Unknown	Unknown	Insufficient Data	
991149	SR 20	Unnamed	Unknown	Unknown	Insufficient Data	
991150	SR 20	Eagle Creek	Barrier	67%	Velocity	
991151	SR 20	Eagle Creek	Barrier	0%	Slope	
991547	SR 20	Unnamed	Barrier	33%	Slope	
995434	SR 20	Unnamed	Unknown	Unknown	Insufficient Data	
995436	SR 20	Unnamed	Unknown	Unknown	Level B - Survey Needed	
997396	SR 20	Unnamed	Barrier	67%	Velocity	
GN36		Unnamed	Barrier	33%	Slope	
GR19	Fir St	Lorenzan Creek	Barrier	67%	Depth	
GR20	S Park Ave	Lorenzan Creek	Barrier	67%	Depth	

Table 2: Field-Based Habitat Surveys in the Baker/Middle Skagit Study Area

Barrier Status:

<i>Barriers</i>	<i>Unknown Barrier Status</i>
30	1

Individual Details for Culverts (n = 31):

Site ID	Road	Stream	Barrier Status	% Passability	Barrier Reason	Weighted Habitat Area M ²	PI
GN18	S Skagit Hwy	Gilligan Creek	Barrier	33%	Slope	4,729	38.54
AR9	Hamilton Cemetary Rd	Red Cabin Creek	Barrier	33%	Velocity	19,654	34.57
991146	SR 20	Childs Creek	Barrier	67%	Velocity		34.3
GN16	South Skagit Highway	Sorenson Creek	Barrier	0%	Drop and Slope	1,311	31.13
AR8	Hamilton Cemetary Rd	Mannser Creek	Barrier	33%	Slope	1,724	28.84
GR54	SR 20	Eagle Creek	Barrier	33%	Velocity	0	26.65
931695		Careys Creek	Barrier	67%	Velocity	2,511	26.18
GN19	South Skagit Highway	Stevens Creek	Barrier	33%	Slope	889	25.68
AR25	1st St	Careys Creek	Barrier	67%	Velocity	0	25.52
AR39	Pettit Rd	Careys Slough	Unknown	Unknown	Level B - Slough	33,143	25.52
AR26		Careys Creek	Barrier	67%	Velocity	23,710	23.65
991150	SR 20	Eagle Creek	Barrier	67%	Velocity		19.78
HC94	Parker Rd	Unnamed	Barrier	0%	Drop	244	15.59
991151	SR 20	Eagle Creek	Barrier	0%	Slope		13.04
GR18	Concrete Sauk Valley Rd	Lorenzan Creek	Barrier	33%	Velocity	1,162	12.83
GR22	Superior Ave	Lorenzan Creek	Barrier	33%	Slope	1,281	12.56
GR17	Concrete Rd	Lorenzan Creek	Barrier	67%	Velocity	230	12.13
931570	Cascade Trail	Eagle Creek	Barrier	0%	Drop	99	12.03
931571		Eagle Creek	Barrier	0%	Drop	56	11.79
GR55	Unnamed	Ebing Creek	Barrier	0%	Drop	23	11.57
931355	Limestone St	Lorenzan Creek	Barrier	0%	Drop		11.56
GR44	Challenger Rd	Ebing Creek	Barrier	0%	Drop	140	11.42
GR9	SR 20	Fish Creek	Barrier	33%	Velocity	117	11.36
931354		Lorenzan Creek	Barrier	33%	Slope		11.23
GR23	SR 20	Lorenzan Creek	Barrier	0%	Slope	227	11.03
GR19	Fir St	Lorenzan Creek	Barrier	67%	Depth		10.94
GR20	S Park Ave	Lorenzan Creek	Barrier	67%	Depth		10.91
931579	Main St	Lorenzan Creek	Barrier	0%	Slope		10.62
991142	SR 20	Unnamed	Barrier	67%	Slope		9.94
GR40	Challenger Rd	Unnamed	Barrier	0%	Slope	107	7.37
997396	SR 20	Unnamed	Barrier	67%	Velocity		4.46