

2023 Skagit Watershed Council Protection Strategy Update

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Introduction

This report is intended to update and improve the voluntary conservation acquisition components of the Skagit Watershed Council (SWC) Habitat Protection and Restoration Strategy (SWC 1998) and its Application (SWC 2000). The 2017 Protection Strategy update was developed to meet a locally identified need to evolve our local strategy to preserve the remaining high quality habitat in the Skagit Watershed as well as to meet the required outputs of a grant (#13-1425) from the Salmon Recovery Funding Board. This 2022 update adds to the 2017 Protection Strategy a strategy to preserve high quality habitat in the Sauk watershed located in Snohomish County and clarification of a process for acquiring parcels in need of restoration according to thresholds defined in Table 1. The combined product should be considered an addendum to the Skagit Watershed Council's Strategy (SWC 1998). While this product meets these needs at this time, it is also intended to be a vehicle for continued improvement in coming months and years.

With the publication of this document, the SWC finds no current need to adjust the goal of the Strategy to "assist and encourage the voluntary restoration and protection of natural landscape processes that formed and sustained the habitats to which salmonid stocks are adapted." We continue to abide by the Strategy's guiding principles and scientific framework, as well as recognize its limitations within the context of broader salmon recovery in Washington State.

While the basic fundamentals still stand, there has been an evolution in our understanding and management frameworks for salmon and salmon habitat recovery since 1998. For example, the Skagit salmon co-managers (Native American Tribes and Washington Department of Fish and Wildlife) drafted, and the federal government approved, the Skagit Chinook Salmon Recovery Plan (Co-managers 2005) as required by their listing as threatened under the federal Endangered Species Act (ESA). In response, SWC developed the Strategic Approach (SWC 2005) to refine our multi-species focus towards understanding, protecting, and restoring habitat forming processes that would have the most benefit for Skagit Chinook salmon. Over the intervening years as our scientific and local knowledge grew, and implementation progress was made, this Strategic Approach was adaptively managed to focus on priority habitats for increasing Chinook salmon abundance, productivity, and diversity, resulting in updates to the Strategic Approach (SWC 2015 and SWC 2022). Additionally, Puget Sound Steelhead were listed as threatened under the ESA in 2007. In response and as an interim step for voluntary habitat recovery while Skagit co-managers develop a formal steelhead recovery plan, SWC developed and adopted the 2016 Interim Steelhead Strategy (SWC 2016). These advancements continue to refine and focus our voluntary protection strategy toward addressing habitat limiting factors for Chinook salmon and steelhead.

The 1998 Protection Strategy was developed to identify conservation acquisition priorities. Subsequently, an empirical "protection formula" was refined through reach-by-reach assessments to evaluate the relative value of potential conservation parcels. This quantitative assessment method, combined with a parcel-level review by the SWC Protection Subcommittee (reporting to the SWC Technical Working Group and Board of Directors), assured the Washington State Salmon Recovery Funding Board (SRFB) that they could allow SWC members to receive reach-level block grants that serve

as a secured local funding source for acquisition. The common method for purchasing conservation properties with SRFB funds is to identify the properties prior to grant rounds and then seek funding through the regular SRFB process; this can take a year or even longer. The nature of real estate transactions favors the ability to act swiftly when an opportunity is identified. With the funding cache made available through reach-level block grants, conservation organizations operating in the Skagit Watershed have been able to move quickly and efficiently on acquisition opportunity and have been very successful in securing conservation properties in the watershed.

While the current formula has served the SWC well for several years, the method has shortcomings and a need to revamp the Protection Strategy was identified. The method described herein is an update to the Strategy and specifically to the formulaic process used to evaluate the conservation value of acquisition opportunities.

Problem Statements

Specific changes to the SWC Protection Strategy have been driven by the identification of problems or weaknesses in the 1998 Strategy and/or its subsequent implementation and outcomes. The following problem statements were developed and vetted by the SWC Protection Subcommittee, Technical Work Group, and Board of Directors. Each has been addressed to a significant degree by “changes” listed in the next section, and each change to the protection strategy can be linked back to a problem statement.

- A. The current SWC protection strategy’s cost effectiveness (CE) scoring process failed to identify some of the high value fish habitats in functioning floodplains. The CE scoring processes’ focus on costs is one significant driving factor in these failures, which in turn is driven by zoning as well as parcel boundary location and size, not reflecting habitat characteristics.
- B. While past acquisitions meeting CE score thresholds have protected many of the largest remaining high quality habitats in the Skagit floodplain, it has also resulted in a checkerboard ownership pattern rather than contiguous, reach-scale land blocks that function at the scale of habitat-forming processes.
- C. The current weighting of main stem aquatic habitats and floodplains disproportionately undervalues tributaries which have emerged as more important than previously thought for Chinook salmon.
- D. Similarly, SWC’s policy priorities have shifted to include steelhead, furthering our need to increase focus on tributaries.
- E. Connectivity and threat have had very limited impact on CE scores though they are important considerations. Known imminent threats haven’t been addressed in past assessments.
- F. The definition and application of isolated habitat over the years aren’t clear and/or sufficiently detailed.
- G. The current protection strategy does not explicitly incorporate ways to characterize and value areas with potential resilience to climate change such as groundwater/surface water sources.
- H. Properties with significant upland habitats do not “rank,” thus disqualifying the uplands as well as large sections of associated aquatic habitat since they cannot be dissected.

Problem statements that remain significantly unaddressed by this iteration of updates are *identified in italics* below. It is our intent to further consider them in the future.

- I. Not all floodplain habitats are of equal value to Skagit salmonids.
- J. Restoration needs and potential are not evaluated through the current CE scoring process. Modest site degradation such as vegetation clearing may impact relative ranking rather than valuing the site's intrinsic potential for aquatic habitat.
- K. Current guidance is mute with respect to marine nearshore habitats outside of the tidal delta.

Architecture & Authorization

Eligible Area

Thus far, eligible acquisitions in the Skagit Watershed were allowed only in areas with existing conservation assessments limiting acquisition to the Upper Skagit, the Middle Skagit, and the Sauk & Suiattle Rivers. The eligible area for acquisition in the 2017 strategy encompasses all Tier 1, Tier 2, and Tier 2S ("Tier 2 Steelhead Target Areas") areas as identified in the Strategic Approach (SWC 2015) and Interim Steelhead Strategy (SWC 2016) in Skagit County. The 2015 Strategic Approach (SWC) expanded Tier 2 Target Areas into fourteen (14) major tributaries that contain significant rearing habitat. The upstream extent is defined by documented Chinook salmon or steelhead distribution, excluding confined channels with floodplain widths less than two (2) channel widths, channels greater than 6% gradient, and parcels with only sub-tributary habitats. The 2022 Strategic Approach (SWC) adds Whidbey Basin pocket estuaries to Tier 2, however this Protection Strategy does not address nearshore habitats. The 2017 and 2022 Protection Strategies apply to all parcels with freshwater floodplain habitat in Tier 1, Tier 2, and Tier 2S Target Areas. This 2022 Protection Strategy updates the 2017 Protection Strategy by applying the same methodology and addressing the problem statements for the remaining unaddressed parcels in the Sauk watershed in Snohomish County that are Tier 1, Tier 2, and Tier 2s. Parcels outside of floodplains and with riparian areas only are excluded.

Upland portions of parcels (also known as Tier 3 Target Areas) outside of the floodplains and their riparian areas can be acquired in association with high quality salmon habitats if the parcel meets habitat thresholds or if other funding programs are used to offset the cost for the upland land area.

Parcels that are already permanently protected for their salmon habitat values were removed from the eligible area before quantifying habitat, connectivity, and threat scores.

Decision Support Framework

The Habitat Protection and Restoration Strategy (SWC 1998) provides an empirical formula for assessing and prioritizing reach level protection projects by their relative cost effectiveness. The 2017 Protection Strategy Update maintains all of the major parameters (with amendments and/or additions listed below), though instead of a single cost effectiveness score for each parcel, it relies upon a decision support framework (Figure 1) to examine habitat, connectivity, and threat parameters in a stepwise fashion to determine the degree to which parcels meet agreed-upon thresholds. Threshold scores are

established for each step to determine if acquisition should proceed, move to the next assessment step, or terminate.

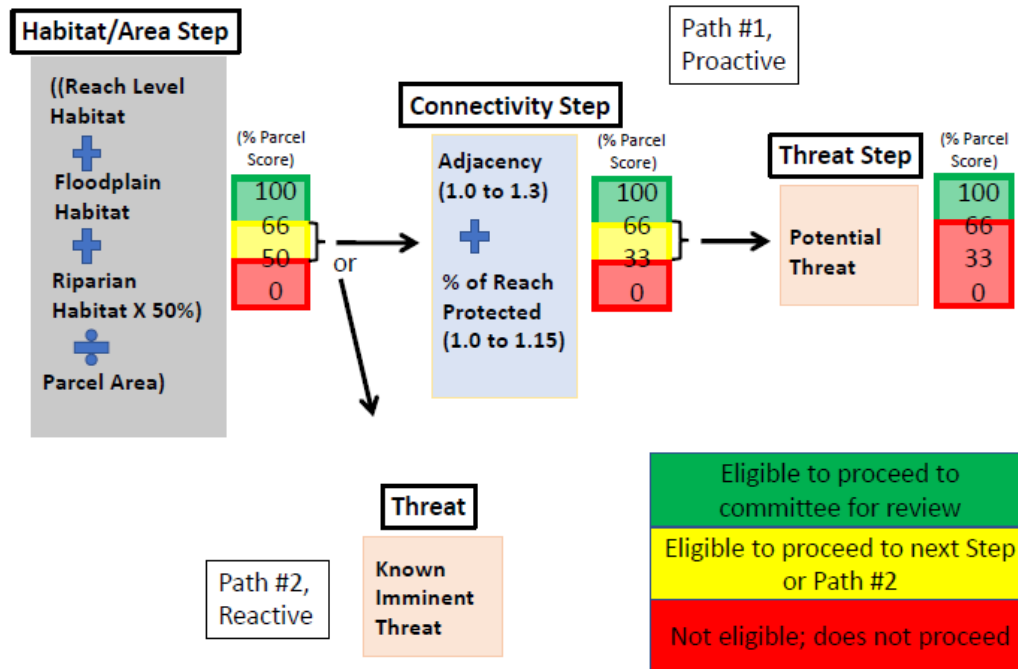


Figure 1. Decision Support Framework for 2017 Skagit Watershed Council Protection Strategy Update

In Figure 1, the top third (>66%) of the evaluated parcels are above the “high” quality habitat threshold and are eligible for acquisition. Parcels ranking in the top half (>50%) but less than the top third, are above the “medium” quality habitat threshold and are eligible to go on to the second ranking step of evaluating their relative connectivity. Parcels ranking in the bottom half (<50%) are considered “low” value habitat and are no longer considered for acquisition.

Parcels that are highly connected and thus rank in the top third of the second ranking step are eligible for acquisition. Parcels that rank above 33% but below the top third during the connectivity step are eligible to go on to the third ranking step of evaluating their relative threat. Parcels ranking in the bottom third (<33%) are considered low value in connectivity and are no longer considered for acquisition.

Parcels that were characterized as medium quality habitat and medium quality connectivity will be further evaluated in the final step of Path #1 for their relative potential threat. Such parcels that are highly threatened and thus rank in the top third of the third ranking step are eligible for acquisition. Parcels ranking in the bottom two-thirds (<66%) are considered low potential threat and are no longer considered for acquisition via Path #1.

An additional pathway (Path #2) through the decision support framework has been developed to reconsider acquisition of parcels with a known imminent threat on a reactive, case-by-case basis. Details are discussed below.

Authorization

Any parcel that meets criteria for being high quality salmon habitat as outlined herein is eligible for purchase with reach-level acquisition grants once a parcel-level review and consent is provided by the SWC Protection Subcommittee, Technical Work Group, and/or Board of Directors as indicated below (known cumulatively to SWC members as “greenlighted”). The Subcommittee maintains a responsibility to report greenlight decisions (with their parcel-level information) to the TWG at the TWG’s next available meeting, as well as provide summaries of purchased lands no less than every six months to the TWG and Board of Directors.

Before considering greenlighting parcels, the Protection Subcommittee Chair or SWC staff shall provide agenda items and review materials including a parcel tracking form and parcel map (Appendix D) with at least 5 days notification to members of the Protection Subcommittee. The Protection Subcommittee shall greenlight or reject the proposed parcel for purchase if within their range of habitat degradation thresholds (Table 1) or recommend the proposed parcel for purchase to the Technical Work Group if in the TWG range according to Table 1.

If parcels are recommended for approval to the TWG, the Protection Subcommittee Chair or SWC staff shall follow the Approval Process for Acquiring Restorable Lands in Appendix B. Review materials (tracking form, maps, restoration assessment and commitment letters) will be provided to the TWG at least 7 days before a TWG meeting. If no regularly scheduled TWG meeting occurs within 4 weeks of the Protection Subcommittee meeting, then a special TWG meeting will be scheduled within 4 weeks. Because protection projects have little time for delay, a quorum for purposes of implementing the Protection Strategy is defined as those voting TWG members in attendance at the special meeting. The TWG shall greenlight or reject the proposed parcel for purchase if within their range of habitat degradation thresholds (Table 1) or recommend the proposed parcel for purchase to the Board of Directors if in the Board’s range. The Board of Directors shall consider the proposed parcel acquisition at their next regularly scheduled meeting only if recommended by the TWG, and with listed review materials provided in a timely manner (Appendix B).

Table 1. Range of Habitat Degradation Thresholds Eligible for Approval by Type.

Degradation Type Within Priority Fish Habitat Area	Protection Subcommittee	Technical Work Group	Board of Directors
Flood Protection Levees (length to edge)	0 to 0%	0 to 10%	10 to 100%
Hydromodification (length to edge)	0 to 0%	0 to 35%	35 to 100%
Vegetation Clearing (area)	0 to 50%	50 to 70%	70 to 100%

Acquisition costs from non-SRFB funding sources can be used for matching reach level grants once review and consent is provided by the SWC Protection Subcommittee using the approved Guidelines for Qualifying SWC Acquisition Match Properties (Appendix B).

Monitoring and Adaptive Management and Assessment Updates

Data layers utilized by the Protection Strategy will be updated to incorporate recommendations flowing from the monitoring of habitat status and trends as well as implementation of the Protection Strategy. Timing of this M&AM process can be recommended on an as-needed basis by any committee or subcommittee, and must be reviewed by the Technical Work Group and approved by the SWC Board of Directors.

Before greenlighting a parcel for acquisition, habitat and connectivity attributes and scores will be updated with site-scale information to validate its qualifications. Additionally, large-scale physical (e.g. channel avulsions) or planning-level (e.g. steelhead recovery research) events significantly changing strategic priorities may trigger systemic review and update of the stepwise assessments.

Methodology for Calculating Parcel Scores

Habitat Parameter

A new metric was developed for habitat scores, where habitat score =

$$\frac{\text{Reach Level Habitat Area} + \text{Floodplain Habitat Area} + (\text{Riparian Habitat Area} \times 50\%)}{\text{Total Parcel Area}}$$

Total Parcel Area

Reach, floodplain, and riparian habitat areas are made up of several components and weighted as described below.

Reach Level Habitat

The reach level or aquatic habitat score for the mainstem Skagit and Sauk rivers is the sum of the channel habitat area, backwater or off channel habitat area minus a percentage for hydromodifications. Reach level habitat area is equal to channel edge length multiplied by an edge-type-specific channel width from the Skagit Chinook Recovery Plan (Hayman 1996, co-managers 2005). This approach best approximates juvenile salmonid rearing habitat within a wide river channel. Reach level main stem habitat has been quantified using the 2015 edge type habitat lines for bar and bank habitat developed by Skagit River System Cooperative (SRSC) following the protocols in Beechie et al (2005). Backwater, braid, and sidechannel habitat areas were directly quantified via the polygon data from SRSC 2015. See detailed methods guide in Appendix C.

- Mainstem hydromodifications were included using inventory data provided by the Upper Skagit Indian Tribe (USIT, 2015). Following observations of decreased fish densities in modified versus natural edge habitats documented in the Skagit Chinook Recovery Plan (Co-managers, 2005), edge habitat area amount was reduced by 66% for these modified bars, banks, and backwaters.

Reach level tributary habitat has been quantified via the area occupied by a modeled 2-year flow event, which is a polygon modeled by SWC following a methodology in Vondrasek (2015). See Figure 1 in Appendix C.

Sub-tributary confluences provide unique high quality habitat for salmonids (Kiffney et al 2006). To acknowledge the increased habitat value of sub-tributaries, credit for additional habitat area has been given. The score was created by multiplying the width of the channel (X) at its confluence with the sub-tributary by a length of two channel widths downstream of the sub tributary; $X*2X$ (or $2x^2$) and adding this to the reach habitat score (Figure 2).

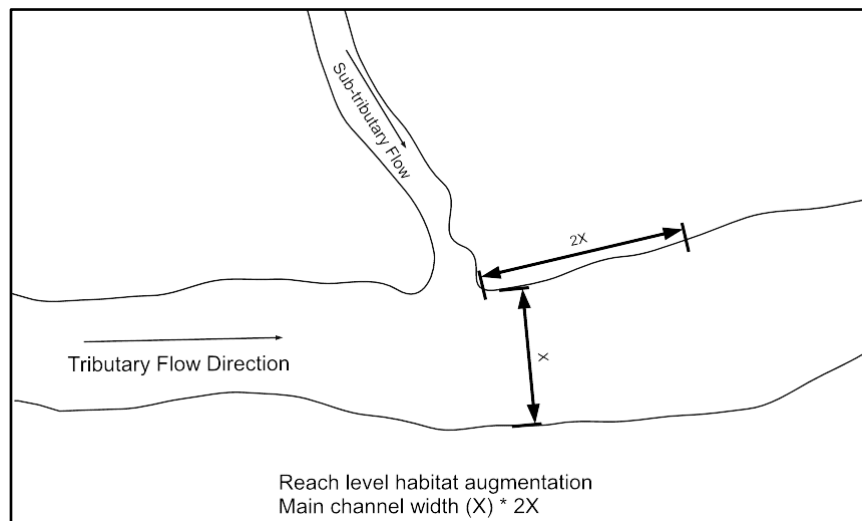


Figure 2. Habitat Gains from Inputs of Sub-tributary Streams

Floodplain Habitat

Non-channel floodplain habitat in the main stems has been quantified via the existing SWC floodplain polygon until updated floodplain layers become available.

Isolated and shadowed habitat have been further defined and delineated, with current definitions and multipliers shown in Table 1. The term isolation remains as defined in 1998 as the lack of anadromous access and has a multiplier of zero (0). Shadowing however reflects muted but existing functions that should not be subject to the same multiplier of zero (0), and thus receives a multiplier of one-half (0.5).

Non-channel floodplain habitat in the tributaries has been quantified via the area occupied by a modeled 100-year peak flow, which is a polygon modeled by the SWC following a methodology in Vondrasek (2015).

Criteria for floodplain categories (Table 2) of moderately impaired and functioning have changed from median tree size < or > twelve (12) inches diameter breast height (dbh) to < or > fifty (50) feet to facilitate remote sensing analyses.

Table 2. Floodplain and Riparian Category Criteria and Multipliers.

Floodplain & Riparian Category	Floodplain & Riparian Land Cover Criteria	Multiplier
Isolated	Isolated from anadromy	0
Shadowed	Muted floodplain or riparian functions.	0.5
Impaired	No forest cover due to human activity	1
Moderately impaired	Median tree height <50 feet due to human activity	2
Functioning	Median tree height <50 feet due to natural processes (e.g. fire, flood)	3
Functioning	Median tree height >50 feet	3

Riparian Habitat

Riparian areas outside of ‘non-channel floodplain habitats’ have been included up to two site potential tree heights beyond the floodplain boundary (defined as 300 feet total in each direction outward and throughout the larger Skagit watershed). No additional area (beyond floodplain habitat area already valued) was assigned for riparian areas inside of the floodplain.

Riparian habitat quality categories have been aligned with floodplain quality conditions, using the same categories and multipliers (Table 2). For example, riparian area functions isolated by a road or levee received zero habitat value.

Given the relatively lower contributions of floodplain boundary riparian areas to habitat forming processes compared to reach level, floodplain or streamside riparian habitats, floodplain boundary riparian habitat values have been discounted by 50% when calculating the base habitat score.

Given the reduced contributions of shadowed riparian areas to fish habitat, these values have been discounted an additional 50% when calculating the base habitat score.

Connectivity Parameter

Connectivity as it is used here pertains to the principal that the habitat value of conservation lands is greater for joined or more connected conservation areas than the sum of several smaller individual or isolated conservation areas making up the same acreage. Consistent with the 1998 Strategy, two types of connectivity were quantified: the adjacency of a parcel to conservation lands and the total amount of conservation lands in the reach where the parcel resides. A parcel listed in conservation status includes only those lands that are intended to be managed primarily for the benefit of fish & wildlife and where

the property's ecological habitat values, processes, and functions are conserved currently and into the foreseeable future.

Given significant progress of on-going conservation actions via fee simple and conservation easement acquisition, connectivity scores were updated to reflect current conditions. SWC has worked with many landowner organizations to both update and evolve the County's protected lands database with protected lands that meet the definition above. This list of groups includes but is not limited to Seattle City Light; Skagit Land Trust; The Nature Conservancy; Puget Sound Energy; the Town of Hamilton; WA Departments of Natural Resources, Fish & Wildlife, and Parks; US Forest Service; and National Park Service. SWC and its partners will maintain this database as lands are protected into the future. Tributaries were included. Agricultural easements that do not protect functional habitat were not eligible for inclusion. Lands protected for utilities such as pipelines were not included, though fish and wildlife mitigation lands such as for Seattle City Light and Puget Sound Energy were.

If the parcel is adjacent to protected land on only one side it would get an adjacency variable of 1.20, on two sides it would get 1.25, and on three or more sides it would get 1.30. No adjacency gets assigned an adjacency variable of 1.

Reach level protection weights were kept the same as in the 1998 Strategy at 15% times the percent of the reach already protected.

Threat Parameter

Consistent with our Strategy (SWC 1998), threat will be categorized in two ways; potential threat and known imminent threat. Potential threat refers to non-immediate habitat threats posed to a parcel based on the parcel's zoning or land use designation. Known imminent threat refers to threats posed to a parcel by highly certain, planned activities. Each of these factors is considered in its own pathway as referenced above under the decision support framework section and shown in Figure 1. The threat assessment step has not been fully developed or needed to date.

Threat Path #1 assesses potential threat similarly to the 1998 Protection Strategy, with Table 3 comparing the 1998 and 2017 method side-by-side. Only parcels zoned in county comprehensive plans defined as medium to high density development would be eligible for greenlighting up to 33% of the population of parcels moving to the threat step. Proposed zoning is defined as those development rights/area at or greater than 1 unit per 5 acres in Skagit County and 1 unit per 4.6 acres in Snohomish County. If more eligible parcels exist in these designations than the 33% threshold, they will be further screened by prioritizing zoning further via increasing development rights/area. Conservation and Reserve Development (CaRD) options will be considered on a case-by-case basis. Rezoning or application of CaRDs may require rescoring via Path #1. Finally, if additional screening is necessary, habitat scores will be used as tie-breakers.

Threat path #2 is a secondary, reactive re-assessment of previously scored parcels that are identified on a case-by-case basis due to a proposed action by the landowner. Table 4 provides examples of types of relevant development activities and relevant documentation that may be included in the Threat and Impact Memo, though is not a comprehensive list. Once a known imminent threat to a parcel that

scored in the 16% of medium-high habitat/area step is identified, documentation of the proposed development activity and its impacts should be provided by the project proponent in a “Threat and Impact Memo.” This memo should include comparable examples of impacts from nearby areas where available. The Protection Subcommittee will review the memo and verify the likelihood of threat to habitat quality as meeting or not the threshold of a known imminent threat. If qualifying as a known imminent threat, they will then estimate the extent and magnitude of likely impacts of the development proposal by rescoring the parcel’s habitat/area. If the new habitat score falls below the 50% threshold, or is reduced by more than 10%, then the Protection Subcommittee may recommend to the TWG and Board of Directors that SWC greenlight the parcel for acquisition.

Table 3. Comparison of 1998 and 2017 Approaches to Assessing Potential Threat of Development.

Land Use/Zoning Designation	% Effective Impervious Area Possible	1998 Inflation Factor	2017 Skagit and Snohomish Comprehensive Plan Zoning Designations
Wilderness Area/ Protected Area	0% to 2%	0%	Not eligible via Potential Threat
Forest/Agriculture/ Recreation Area/Parks with Developed Areas/ Low Density Residential	1% to 4%	4%	Not eligible via Potential Threat
Medium-High Density Residential/Urban/ Industrial	10% to 86%	10%	<u>Skagit County</u> : Rural Intermediate, Rural Village/Residential, Rural Cluster, Urban Growth, Urban Reserve Residential, City. <u>Snohomish County</u> : Rural Diverse, Rural Cluster; Conservation & Reserve Development (CaRD)

Table 4. Examples of Known Imminent Threats and Documentation for 2017 Protection Strategy.

Examples of Relevant Development Activities Qualifying as Known Imminent Threats	Examples of Documentation in Memo
Timber harvest within CMZ or specified buffer width for adequate protection of stream type	Forest Practice Application; Regulatory Agency Opinion of Likelihood of Approval
Zoning change or conversion to a more intensive land use	Rezone Application; Past Examples of Similar Rezones
Parcel for sale with potential to reduce existing impacts	Real Estate Listing or For Sale By Owner (FSBO); Regulatory Agency Opinion of Likelihood of Approval
Parcel for sale with building or clearing in floodplain or riparian area allowed	Real Estate Listing or FSBO and Regulatory Agency Opinion of Likelihood of Approval
Parcel for sale with additional buildable lots	Real Estate Listing or FSBO and Current Zoning Designation

Proposed rip-rapping, diking, or other hydromodifications	Permit Application; Regulatory Agency Opinion of Likelihood of Approval
Proposed dredging	Permit Application; Regulatory Agency Opinion of Likelihood of Approval
Road building within floodplain or 200 feet of salmon bearing water	Permit Application; Regulatory Agency Opinion of Likelihood of Approval

Other Parameters

Cost

The emphasis on cost has been reduced in favor of a stronger habitat focus, but will remain an important attribute. Parcel size will serve as the primary indicator of property costs.

The cost modifier of the original formula has never been used for correcting real versus modeled cost effectiveness as envisioned and so is dropped from further consideration in the 2017 Protection Strategy Update.

Results and Discussion

This analysis incorporates practical knowledge gained through 18 years of implementation of voluntary acquisition, an inventory of 3700 acres of lands acquired in that time, new remote sensing completed by our members and SWC staff, and new hydraulic modeling in Skagit tributaries also completed by SWC staff. New methods were developed to better account for how juvenile fish use mainstem and tributary edge habitats, the positive effects of tributary inputs such as climate resilience, the provision of resources from riparian habitats inside and outside of the floodplain, the value provided by aggregating lands to benefit reach-scale processes, and the threat of potential and known development impacts. And importantly, an updated and common understanding was developed among 40 members of the Skagit Watershed Council about what constitutes high quality habitat that is deemed of sufficient value to put into permanent protection for the benefit of salmon and our community's future generations.

Multiple parameters outlined above were objectively quantified for 3388 Skagit River mainstem parcels, 278 Sauk River parcels, and 275 tributary parcels. The results of these analyses have been compiled into spreadsheets of empirical information and six map layers (mainstem, Sauk, and tributary versions for habitat and connectivity) that provide insights into relative conditions across habitat, and connectivity including each of their sub-parameters so that a more nuanced understanding can be derived in a step by step analysis across this expansive and diverse watershed.

In the mainstem, the habitat scores range between 8.6692 and 0, with the top 33% (1152 of 3388 parcels) scoring greater than 0.98903 and the next 33.01% to 50% (543 parcels) scoring between 0.98902 and 0.45593. In the Sauk, habitat scores range from 5.4986 to 0, with the top 33% (95 of 278 parcels) scoring greater than 2.7100 and the next 33.01% to 50% (44 parcels) scoring between 2.7099 and 1.9848. In the tributary parcels, the habitat scores range between 7.8332 and 0.0123, with the top 33% (94 of 275 parcels) scoring greater than 2.0572 and the next 33.01% to 50% (an additional 43

parcels) scoring greater than 1.3469. These scores become the thresholds for determining when to consider greenlighting, moving to the next stepwise assessment, or removing from further consideration.

About 543 mainstem, 44 Sauk parcels, and 43 tributary parcels with moderate habitat value are eligible to be assessed for connectivity. A subset of those parcels are eligible for greenlighting based on our site-scale assessment. In the mainstem, the connectivity scores range from 2.4011 to 2.0034, with the top 33% scoring greater than 2.0741. In the Sauk, connectivity scores range from 2.394 to 2.114, with the top 33% scoring greater than 2.2525. In the tributary parcels, the connectivity scores range between 2.437 and 2.019, with the top 33% scoring greater than 2.0681. Again, these scores become the thresholds for determining when to consider greenlighting, move to the next stepwise assessment, or remove from further consideration.

Table 5. Break points for Decision Framework

	Green Habitat Scores (>66 th percentile)	Yellow Habitat Scores (66 th to 50 th percentile)	Red Habitat Scores (<50 th percentile)	Green Connectivity Scores (> 66 th percentile)	Yellow Connectivity Scores (66 th to 33 rd percentile)	Red Connectivity Scores (<33 rd percentile)	# of Parcels Assessed	Range of Habitat Scores
Mainstem	> 0.98903	< 0.98903 > 0.45593	< 0.45593	> 2.0741	< 2.0741 > 2.0377	< 2.0377	3388	8.6692 - 0
Sauk	> 2.7100	< 2.7100 > 1.9848	< 1.9848	> 2.394	< 2.394 > 2.114	< 2.114	278	5.4986 - 0
Tributaries	> 2.0572	< 2.0572 > 1.3469	< 1.3469	> 2.0681	< 2.0681 > 2.0564	< 2.0564	275	7.8332-0.0123

Finally, another 200 or so parcels of moderate habitat value and moderate connectivity could be screened for potential threat based on their specific zoning if necessary according to the step-wise decision making tool. This step has not been implemented thus far.

The results of all these stepwise assessments have been mapped in green, yellow, and red symbology to correspond to Figure 1 thresholds, and are available to SWC members and members of the public upon request.

This assessment identified 1074 “piano key” parcels, which as the name suggests, are small, narrow parcels lined up adjacent to each other and often fronting aquatic habitats. Habitat scores for these piano keys ranged from very low to very high. However, given their high cost, difficulty to manage (e.g. homeowner associations), and interrelated character of these parcels, SWC has chosen to exclude 9 of these piano key areas from being considered for voluntary acquisition in the near future. This assessment confirms, though, that these areas do still include important habitats that should continue to be protected through other means.

This assessment also produced a handful of parcel scores that were inconsistent with our conceptual model of lands worth protecting through acquisition, which isn’t surprising given the landscape scale of

this effort. In particular, several parcels appeared to have become “lost” to riverine erosional processes, leaving too little edge, floodplain or riparian habitat to raise their score above established thresholds for greenlighting. These parcels were removed from the assessment given this unique condition and would thus have to be considered in the future on a case-by-case basis. It follows that if this analysis has missed eligible parcels in this landscape scale analysis that they too can be considered at some future point on a case-by-case analysis using the thresholds established herein.

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Appendix A: Approval Process for Acquiring Restorable Lands v8.11.2022 final

Our primary purpose in acquiring land for salmon has been, and will continue to be, to prevent further impacts to landscape processes by protecting lands that are currently functioning. The method for prioritizing and acquiring these types of acquisitions is documented in the Skagit Watershed Council (SWC) 1998 Habitat Protection and Restoration Strategy (SWC 1998) and Protection Strategy Update (SWC 2017). The Approval Process for Acquiring Restorable Lands is an addendum to these and included in this 2023 Protection Strategy update, intended to establish a method by which less-functioning impacted properties with high intrinsic habitat value are evaluated and prioritized for purchase using the SRFB reach-level grants. Restoring natural landscape processes that create and sustain salmon habitat will be the primary long-term stewardship goal for such properties.

To increase fish habitat there is a need to purchase high intrinsic-habitat-value properties that need restoration. The term “impacted” for the purposes of this addendum refers to properties that significantly lack native vegetation and/or lack floodplain function because of hydromodifications or levees. The ability to restore natural processes depends on landowner permission or public ownership to enable restoration and achieve salmon recovery goals. Because restoration is part of the objective in purchasing these impacted properties, the method outlined herein necessarily involves not only conservation practitioners in the Protection Subcommittee but also restoration practitioners, including the Technical Work Group (TWG) and the Board of Directors of the Skagit Watershed Council. The primary target of reach level grants remains functioning properties purchased with the goal to protect intact habitat. If this process is used to allocate protection funding for restorable lands, there must be a highly certain commitment and resulting plan that the property will be both protected for its current values and restored to the highest degree possible for salmon recovery benefit.

In the current method for prioritizing and implementing acquisitions there are degradation thresholds for triggering involvement by the Technical Working Group and Skagit Watershed Council Board of Directors (Board) in the decision-making process (see degradation thresholds below and in 2017 SWC Protection Strategy). While triggering those thresholds has been a rarity in the past, it is becoming more common. The Protection Subcommittee, TWG, and Board have identified the need to develop a predictable process for moving forward with key acquisitions that need restoration and that are not feasible as stand-alone grant requests due to time sensitivity or size, for instance. This document defines those cross-committee interactions to make the best possible decision for salmon. Objectives of an effective method shall include:

- A nimble and timely process that considers the constraints of real estate markets and transactions (thus reach-level grant rather than stand-alone grant proposal),

- An ability to consider any parcel identified in the 2017 Protection Strategy as potentially greenlightable,
- A commitment to and thus understanding of management and restoration implications in advance, including early engagement with restoration partners,
- A clearly established restoration pathway with no significant barriers or constraints to restore lands in a timely manner, or at a minimum that those barriers or constraints are known and their risks are acceptable to the Skagit Watershed Council,
- A method of identifying and engaging the appropriate ultimate landowner, and
- Clear and substantial benefits to salmon preferably tied to existing assessments and plans.

Towards meeting these objectives, the following process will be implemented for proposed acquisitions that exceed the existing thresholds for Protection Subcommittee approval and therefore require TWG and Board involvement:

Step 1: If recommended by the Protection Subcommittee (PS), greenlightable (green but not yet greenlit), mostly floodplain properties that exceed restoration need thresholds will be referred first to the TWG for approval and then possibly to the Board according to the following table:

<u>% HYDROMOD</u> <u>(length to edge)</u>	<u>% FLOOD PROTECTION</u> <u>LEVEES (length to edge)</u>	<u>% VEGETATION</u> <u>CLEARING (area)</u>
0%=PS; >0-35%=TWG; >35-100%=Board	0%=PS; >0-10%=TWG; >10-100%=Board	0-50%=PS; >50-70%=TWG; >70-100%=Board

Step 2: TWG chair and PS chair **confirm timelines** established in the most current Protection Strategy for cross-committee process based on urgency of purchase and threats.

Step 3: Potential restoration **partners are identified** based on scale and type of restoration project, experience in the area, and availability.

Step 4: Project Sponsor **collaborates** with restoration partners to complete 4 outcomes that commit to restoring the property (when/if purchased) within a few years:

- Conduct a **field visit with restoration partners** to assess restoration needs, or an alternative, agreed-upon approach.
- Draft a **short-term restoration planting plan** to meet minimum SWC buffer-width requirements, with rough cost estimates based on comparables and best professional judgement.

- c. Submit a **letter of commitment and cooperation from sponsor**/future conservation property owner addressed to restoration partner and SWC, affirming the project sponsor's intent and **level of willingness** to host and participate in restoration actions when property is purchased. or post-acquisition additional scoping as soon as possible and as fiscally practicable after due diligence, or agreement to transfer the property to an appropriate landowner, given specific, inherent risks.
- d. Submit a **letter of commitment and cooperation from restoration partner**, addressed to project sponsor and SWC, or possibly joint letter with project sponsor, outlining
 - i. The restoration partners **level of willingness** to work to expeditiously restore degrading elements that contribute to degradation thresholds in partnership with owner/sponsor, as fiscally practicable after due diligence given specific, inherent risks, and
 - ii. Likely mid- and long-term restoration needs and, if appropriate, a **rough plan** outlining how to meet minimum restoration need thresholds not already addressed in the short-term restoration planting plan, including rough cost estimates, timeline, and any potential barriers. When the property is purchased, if such an assessment will require significant time and costs, restoration partner's costs may be reimbursable by project sponsor at an agreed upon not-to-exceed (NTE) amount based on the scope and complexity of the assessment.

Step 5: TWG and/or the Board will **evaluate** the proposed acquisition in a meeting based on (in order of importance):

- a. The importance of the property for salmon benefit both with and without restoration.
- b. The relationship of the acquisition to existing restoration plans and prioritizations such as the Skagit Chinook Recovery Plan, the SWC 4 Year Work Plan, reach-scale feasibility studies, and others. Additional factors can be considered, including if a property is a "key" acquisition, meaning it is the first in a priority area, a purchase that facilitates the acquisition of other key parcels, or helps complete area acquisitions.
- c. The likely success of the draft restoration plan to benefit salmon and to be implemented.
- d. The level of commitment provided by the project sponsor and willingness of a restoration partner to do restoration work if the property is purchased.

Step 6: The project will be **greenlighted, or not**, for purchase. If the acquisition project sponsor cannot reach agreement to proceed with the current landowner within one year, the authorization to proceed expires.

Step 7: If the property is purchased:

- a. It will be reported to the Protection Subcommittee, TWG and Board of Directors at their next meetings and recorded in the acquisition database for follow up.
- b. The status of restoration planning shall be reported to the Protection Subcommittee and TWG as soon as possible and no less often than every 6 months following that first report until completed.
- c. While building demolitions and smaller revegetation are often funded via the reach-level grants, prioritization of larger restoration projects will happen through the usual project ranking process. If the restoration needs to be funded, the restoration project will be added to the 4 Year Work Plan (if not already on it) as a project in feasibility or design phase.

Appendix B. Guidelines for Qualifying SWC Acquisition Match Properties

At the June 26, 2012 Skagit Watershed Council (SWC) Protection Subcommittee (PS) meeting, the PS decided that if it supports and approves applying SRFB funds toward the acquisition of a property then, regardless of the proportion of SRFB funding and other funding sources, all non-SRFB funds expended for that property purchase may count fully towards SRFB match provided that the Deed of Right is placed on the whole property. On September 25, 2012 the PS also approved the following guidelines for “stand alone” properties where 100% of the purchase price comes from other sources and the property is offered as match:

1. A property is eligible to be used as match if it meets or exceeds one or more thresholds established in the 2017 SWC Protection Strategy Update (unless PS determines that there is a valid reason to disallow it).
2. If the CE score for a property does not meet any of those thresholds, the property can be eligible to be used as match IF the PS concludes that conservation ownership of the property would allow for significant protection or enhancement of ecosystem processes important for creating and sustaining river and floodplain ecosystems and salmonid habitat. To be eligible for use as match the PC must agree that based on quantitative data and best professional judgment many of following criteria are met:
 - a. The property contains or borders intact salmon habitat that may include:
 - i. **Middle Skagit** – high-value habitat or priority protection sites defined as mainstem backwater, mainstem secondary channel, off-channel and at tributary junctions with the mainstem;
 - ii. **Sauk River** – properties susceptible to erosion from active migration
 - iii. Other salmon-bearing mainstem, off channel, or tributary stream habitat.
 - b. The property includes functional floodway or floodplain habitat.
 - c. The property may include some upland that contributes functional riparian forest or is at risk of short-term development that would degrade adjacent priority habitat or functional floodplain. (Explain how the acquisition of the uplands is essential for protecting salmonid habitat through protection of watershed processes, channel migration, or water quality).
 - d. If the property includes some degraded floodway, floodplain, or significant riparian habitat within 300 feet of existing mainstem, tributary, and floodplain habitat or within area inundated at 2-year flow (frequently flooded areas) it can be restored with replanting or as part of a potential larger restoration project.
 - e. Acquisition of the property has a current or potential benefit of connecting adjacent conservation properties and fits in with a realistic strategy for accumulation of important properties.
 - f. The property does not include any structures or “improvements” that are an inordinate percentage of the sales price.
 - g. Other criteria or considerations not included above deemed appropriate by the committee

Appendix C. Methods for 2017 and 2023 Protection Strategy Update

Introduction

Two assessment methods were used to provide a list of conservation parcels ranked by habitat and connectivity: one for parcels in the mainstem and Sauk River and one for parcels in the tributaries. These methods outlined in the 2017 Protection Strategy Update and this 2023 Protection Strategy Update are a major revision of the prioritization method originally outlined in the 1998 Habitat Protection and Restoration Strategy, shifting from a cost-benefit analysis to a habitat quality assessment. Methods described herein determine relative habitat quality at the reach scale for acquirable parcels. These ranked parcels are eligible for purchase using the Salmon Recovery Funding Board (SRFB) block grants according to the Skagit Watershed Council's Protection Strategy decision support framework.

The tributary assessment of 275 parcels was completed first, in 2017. The initial work in the tributaries allowed a test of the step-wise approach of the Decision Support Framework on a smaller but more diverse set of parcels and habitats. The mainstem assessment of 3388 parcels was completed second, in 2017. The Sauk Assessment for parcels in Snohomish County was completed in 2022. All three assessments use largely the same data inputs.

Tributary Assessment Methods

The 275 parcels analyzed represent all the privately owned, potentially acquirable parcels with the 8 Tier 1 and 2 tributaries flowing through them (Nookachamps, Hansen, Day, Finney, Illabot, Dan, Diobsud, and Bacon creeks), up to the limits of documented steelhead distribution or to the limit of the 2006 LiDAR data (in the Nookachamps and EF Nookachamps). All publicly owned parcels or already protected parcels (such as Skagit Land Trust (SLT), The Nature Conservancy (TNC), and Seattle City Light (SCL) owned) were removed from the ranking. The other 6 Tier 1 and 2 tributaries flow through public, mostly National Forest & National Park lands (Goodell, Texas, Buck, Downey, White Chuck, and the North Fork Sauk) and were excluded. Also excluded from the possible tributary parcels are parcels above Big Lake in the Nookachamps and a few parcels in the industrial forest lands far up Day Creek where the valley confined the creek (the hydraulic modeling upon which the determination of floodplain habitats was based did not continue up there).

Habitat Score Calculations

The habitat score for a parcel is equal to the sum of weighted habitat areas within that parcel divided by the total parcel area in square feet. Habitat types comprising the score include reach level or wetted habitats, floodplain habitat, and riparian habitat within two site potential tree heights of the floodplain edge (estimated to be 300 feet). The calculations capture reach-level habitats and sub-tributary inputs, and the function or level of impairment of floodplain and riparian forests according to metrics developed by the Protection Subcommittee and reviewed by the SWC Technical Work Group (TWG). (Note "Decision Framework section" in Strategy Update Document).

Reach Level Habitat

Reach level tributary habitat was quantified via the area within a parcel occupied by a modeled 2 year flow event, which is a polygon delineated according to a methodology in Vondrasek (2015) (Figure 1).

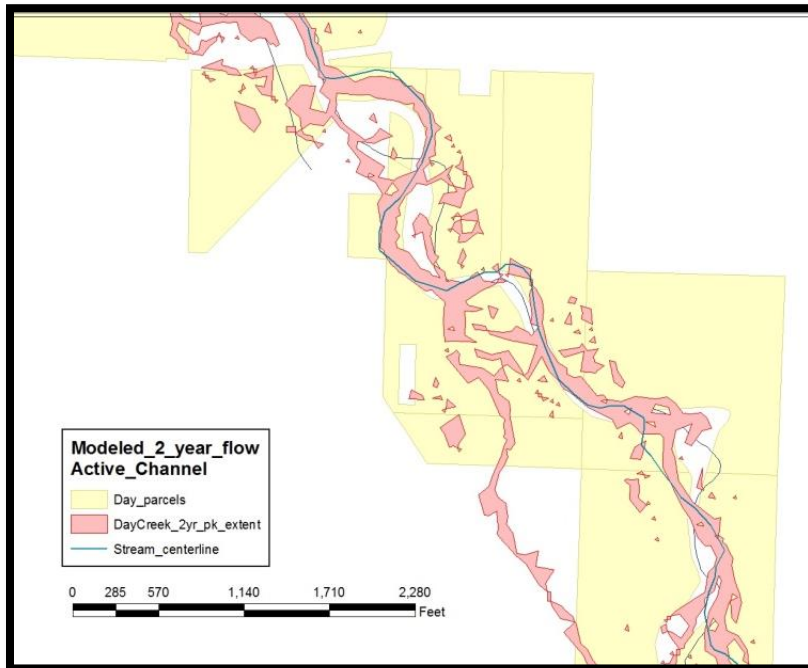


Figure 1. Modeled 2-year flow areas with parcels. Example: Day Creek

Where a lower order stream (a “sub-tributary”) input into the tributary occurred, an additional reach level habitat area in the parcel was added to the habitat area total. The additional area was calculated as the product of multiplying two (2) by the main tributary channel width by the main channel width found where the lower order stream flows into the tributary. This auxiliary area accounts for an area of enhanced fish use and benefits immediately downstream from tributary inputs documented in Kiffney et.al., 2006.

Floodplain and Riparian Habitat

Areas of non-channel floodplain habitat in the tributaries were quantified via the area occupied by a modeled 100 year peak flow, which is a polygon modeled following a methodology in Vondrasek (2015). The area of riparian habitats outside of ‘non-channel floodplain habitats’ included up to two site potential tree heights beyond the floodplain boundary (300 feet). In both areas, the “floodplain” polygon and the “riparian buffer” polygon beyond the floodplain, the habitats were calculated according to the forest function or impairment. The condition or function of the forest was assessed from aerial imagery, and classified into “functioning”, “moderately impaired”, and “impaired”. Polygons of forest condition were hand delineated in GIS. The imagery used included NAIP 2013 and 2015, and a 2007 Skagit County image set.

The top 33% exceeded the high quality habitat threshold and are eligible to be greenlighted (approved) for protection acquisition following the Decision Support Framework. Parcels ranking above 50% but that did not rank above the high quality habitat threshold are considered to have exceeded the medium habitat threshold and will be evaluated for connectivity.

Connectivity Score Calculations

The connectivity step in the step-wise decision support framework seeks to capture the importance of habitat connectivity between protected parcels for the medium habitat quality parcels. The connectivity assessment score incorporates a variable for a parcel's adjacency to other protected parcels (If the parcel is adjacent on only one side it would be assigned 1.20, on two sides it would get 1.25, and on three or more sides it would get 1.30. No adjacency has a value of 1) and a variable for the percent of the tributary or reach in protected and public ownership. An additional multiplier of 15% was applied to the percent of the reach where the parcel occurs that is in protected and public ownership: $\text{adjacency} + \% \text{protected} * 0.15 + 1 = \text{connectivity score}$ The assessment added the variables for adjacency and percent protected to get a connectivity score. Parcels with connectivity scores in the top third are considered eligible for purchase.

Mainstem and Sauk Assessment Methods

Habitat Score Calculations

A parcel habitat assessment was completed on 3388 mainstem floodplain parcels and the 278 Sauk Snohomish County parcels using the habitat area calculations outlined in the step-wise approach of the Decision Support Framework. Table 1 outlines the mainstem method for GIS analysis used in generating data for the Sauk reaches as an example of the process.

Assessed parcels represent all of the privately owned, potentially acquirable parcels in the Tier 1 and Tier 2 floodplains of the watershed. All publicly owned parcels or already protected parcels (such as SLT, TNC, and SCL owned) were removed from the ranking calculations in the floodplains.

The habitat score for a mainstem parcel is equal to the sum of weighted habitat areas within that parcel divided by the total parcel area in square feet. Habitat types comprising the score include reach level or wetted habitats, floodplain habitat and riparian habitat within two site potential tree heights of the floodplain edge (estimated to be 300 feet). The calculations capture reach-level habitats and sub-tributary inputs, and the function or level of impairment of floodplain and riparian forests according to metrics developed by the Protection Subcommittee and reviewed by the TWG.

Reach Level Habitats

Reach level habitat (open water) area for the river edge of a parcel was calculated using a length of river edge categorized by habitat type times a width for that habitat type within each parcel (Figure 2). Reach level mainstem habitat was quantified via the 2015 edge habitat polylines drawn and classified by Skagit River System Cooperative (SRSC) following the protocols in Beechie et al 2005. The width multipliers for edge habitat used were: 2.6m for "banks" including hydromodified banks, 15.6m for bar, and 7.8m for backwaters (Hayman et.al., 1996 and Beamer et. al., 2000). These widths represent the relative habitat availability for juvenile salmon rearing in the larger river

channels (Hayman et.al, 1996 and Beamer et. al, 2000). Any parcel adjacent to the river was assigned an amount of reach habitat extending into the river based on this formula.

Table 1. Sauk Protection Strategy Data Development

Identifying Eligible Parcels to Score

Selected non-tax-exempt parcels from Snohomish County parcels (fee simple parcels potentially available for purchase *Sauk_Scored_Parcels*)
Clipped and retained non-exempt parcels that intersected the broadest extent of salmon habitats (geomorphic floodplain *SWC_Tiers1and2_upstreamSedro*)

Calculating Edge Habitat Square Feet (mainstem model)

Clipped Edge habitat lines *SkagitSystemEdge2015_final* with *Sauk_Scored_Parcels*
Spatially joined clipped edge habitats with parcels to assign parcel numbers to edge habitat segments. Verified accurate assignments.
Calculated total edge type (bank, bar, backwater) length by parcel number in Excel using a pivot table (*Sauk_Edge_Calculations4*).
Multiplied each edge type by the habitat area/fish density factors from the Chinook Recovery Plan (bank = 8.53ft, bar = 51.8ft, backwater = 25.59ft).
Summed all three types to get edge habitat square feet per parcel.
Joined results into *Sauk_Scored_Parcels* shapefile (temporarily) and *Sauk_Parcel_Scoring-2020* spreadsheet.

Calculating Side Channel and Backwater Square Feet (mainstem model)

Clipped side channel, braid, and backwater (habitat) polygons from *SkagitSystem2015_final* to *Sauk_Scored_Parcels*.
Unioned with parcels to attach parcel IDs to habitat polygons.
Calculated total side channel and backwater (and braid) habitat in Excel by parcel using a pivot table (*SideCh_Backwater_Calculations*).
Joined results into *Sauk_Scored_Parcels* shapefile (temporarily) and *Sauk_Parcel_Scoring-2020* spreadsheet.

Identifying Isolated Reach Habitat Square Feet

There is no isolated reach habitat (no channel, side channels, backwaters, or braids overlay isolated habitat from *floodplain_impairment_2015*). There is isolated floodplain (covered below) but no isolated channel.

Calculating Sub-tributary Junction Area

Identified junctions at the intersections of *SWIFD_ALL_LLID* lines and *SkagitSystemEdge2015_final* lines (*Sauk_trib_junctions*).
Spatially joined junctions to *Sauk_Scored_Parcels*. There are 8 tributaries that enter mainstem edge habitats within scored parcels (*Sauk_trib_junctions_SpatialJ*).
Calculated square feet of reach habitat bonus using the formula of 2 times the width of the tributary times the edge type width factors from the Chinook Recovery Plan (bank = 8.53ft, bar = 51.8ft, backwater = 25.59ft). However, the tributary width could not be measured because of tree cover. I made a best guess of widths based on vague shadowy glimpses of channels I got at breaks in the trees and used the average of those measurements for all streams unless I could see otherwise. This meant all streams except Falls Creek were given a width of 10 feet. Falls Creek could be measured in a few places and was given an average width of 20 ft.

Mapping Functioning, Moderately Impaired, and Impaired Forest

Clipped *Sauk_Scored_Parcel*s with *SWC_Tiers1and2_buffered* (the extent of salmon habitat) to create *Sauk_Forest_Cover_clip*.

Digitized functioning (mature, closed canopy or naturally disturbed and regenerating) forest, moderately impaired (immature, median tree bole diameter <12", and/or < 50% cover due to human activity, or recently replanted) forest, and Impaired (no forest cover) forest polygons within the clipped parcel footprint (*Sauk_Forest_Cover_clip*).

Found 32 polygons that did not get selected and added to *Sauk_Forest_Cover_clip* during QA. Added these (labeled addendum in comments) and categorized as above.

Unioned forest cover by parcel (*Sauk_Forest_Cover_clip*) with the floodplain to classify forest as riparian or floodplain (*Forest_Cover_Union*).

Combining Forest Cover with Connected and Shadowed Floodplain

Cleaned up and then unioned *Forest_Cover_Union* with *floodplain_impairment_2015* to get final classification for the master calculations table: shadowed and connected areas by forest cover for the floodplain and for riparian area.

Calculated the sum of habitat types by parcel in *Cover_Impairment_Union_calculations*.

Creating the master table and GIS layer for mapping the model

Pasted habitat areas into *Sauk_Parcel_Scoring_Master_final* Excel workbook and calculate habitat scores according to the Protection Strategy model.

Joined habitat scores to parcels in *Sauk_Habitat_Scores_DRAFT* feature layer.

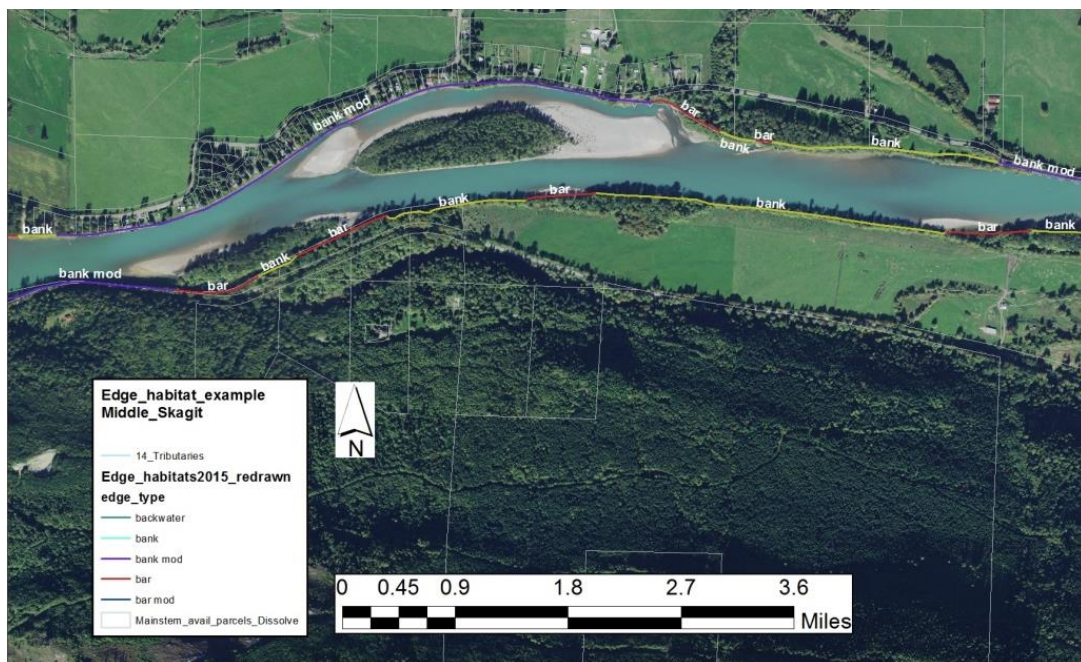


Figure 2. Mainstem edge habitats example. Savage Reach

In addition to the reach areas derived from edge habitat types, places where a lower order stream (a “sub-tributary”) input into the mainstem river was assigned an additional reach level habitat area in the parcel and added to the habitat area total. The area was defined by multiplying the

width of the channel (X) at its confluence with the tributary by a length of two channel widths downstream of the sub tributary; $X*2X$ (or $2x^2$). Figure 3 illustrates the method for quantifying inputs for tributaries. This auxiliary area amount accounts for an area of enhanced fish use and benefits immediately downstream from tributary inputs, as documented in Kiffney et.al. 2006.

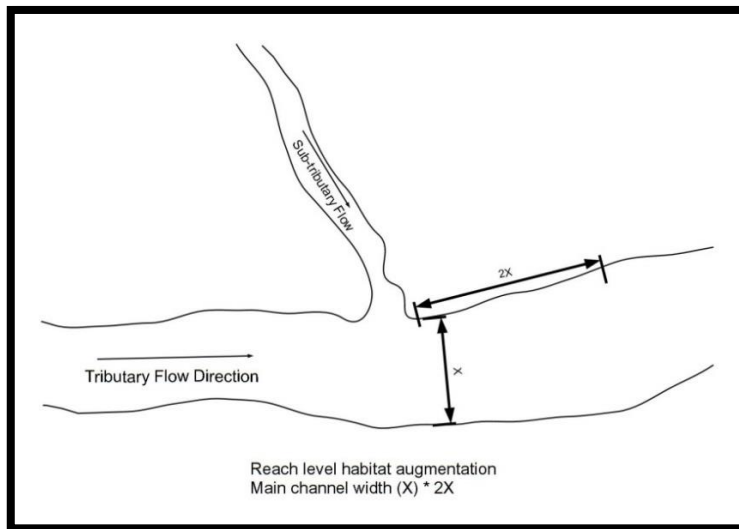


Figure 3. Illustration of method for calculating the area of habitat benefits at the inputs of lower order streams (sub-tributaries).

Floodplain and Riparian Habitat

Areas of non-channel floodplain habitat in the mainstem were quantified using the existing SWC floodplain polygon mapped in 1999, assumed to be the geomorphic floodplain. The floodplain was divided into connected, shadowed, and isolated areas. Shadowed and connected polygons were mapped by SRSC in 2015 based on the presence of hydromodifications and roads. Polygons along the Skagit mainstem were then divided into the categories of 'mainstem functioning', 'mainstem moderately impaired', 'mainstem impaired', 'shadowed functioning', 'shadowed moderately impaired', and 'shadowed impaired' based on forest habitats. Forest conditions were manually interpreting using 3 image data sets: the 2007 Skagit County imagery, and 2013 and 2015 NAIP imagery. Snohomish County Sauk parcels were categorized the same way using 2017 imagery. Once delineated, areas were weighted by multiplying the area of classified polygons by the multiplier specific to each of the categories (Table 2).

The area of riparian habitats adjacent to floodplain habitats were included in a "riparian buffer" polygon, up to two site potential tree heights beyond the floodplain boundary, assumed to be 300 feet. The riparian buffer polygon beyond the floodplain was subdivided and weighted the same way as the floodplain habitats, according to the forest function or impairment and weighted according to Table 2.

Table 2. Weighted areas for floodplain and riparian habitats.

functioning forest	Area*3
moderately impaired forest	Area*2
impaired forest	Area*1
shadowed functioning forest	Area*1.5
shadowed moderately impaired forest	Area*1
shadowed impaired forest	Area*.5
riparian buffer functioning forest	Area*1.5
riparian buffer moderately impaired forest	Area*1
riparian buffer impaired forest	Area*.5
riparian buffer shadowed functioning forest	Area*.75
riparian buffer shadowed moderately impaired forest	Area*.5
riparian buffer shadowed impaired forest	Area*.25
isolated	Zero habitat area valuation

“Isolated” areas were not counted as contributing habitat value in the mainstem floodplain or riparian buffer. The ‘isolated’ floodplain polygon layers used in this habitat assessment comes from earlier work in the watershed (from the 2010 Middle Skagit Assessment or 1998 Chinook Strategy documents).

Additional guidelines to delineate and count the riparian buffer habitats due to data gaps in “isolated” floodplain impairment polygons and “isolating” features:

- We did not count the riparian buffer (or floodplain) habitat anywhere in the mainstem or the tributaries where there were “isolating” features in the floodplain between the Skagit or tributary and the riparian buffer.
- We did not count habitats in the riparian buffer beyond “shadowed” polygons, as “shadowed” riparian habitats. In theory, although there will be long areas of the mainstem floodplain without any riparian buffer areas counted, there will be fewer mainstem “shadowing” or “isolating” areas further upriver.
- There are areas where the existing data (the “isolated” polygons from the 1998 Strategy work or the 2010 Middle Skagit Assessment) does not extend beyond the floodplain and into the riparian buffer. However, in these places where the infrastructure polyline or polygon (the road or hydromodifications) that creates or causes the isolation does continue, the isolation impact of the structures was considered to continue. In places where there is an ‘isolated’ polygon in the floodplain (within the data from Middle Skagit Assessment or 1998 Strategy) ends, but where the landscape feature causing the “isolated” polygon (a road or hydromodification) continues, it is assumed that the isolating feature will continue to act on the river and the landscape. Habitat in the riparian buffer beyond this continuation of the “isolating” feature was also not counted.

Connectivity Score Calculations

The mainstem connectivity score calculations were done similarly to the tributary connectivity assessment. The decision support framework seeks to capture the importance of connectivity to other protected parcels for the parcels ranking above 50% but that did not rank above the high-

quality habitat threshold (66th percentile). In the mainstem assessment this totaled 575 parcels. In the Sauk assessment it totaled 44 parcels. The calculation used a variable for a parcel's adjacency depending on the number of adjacent protected and public parcels; (1 for zero adjacent protected parcels, 1.2 for one adjacent parcel, 1.25 for two adjacent, and 1.3 for three or more adjacent). An additional multiplier of 15% was applied to the percent of the reach where the parcel occurs that is in protected and public ownership. Following the method tested in the tributary assessment, we added the variables for adjacency and percent protected times 0.15 and reordered these parcels: $\text{adjacency} + \% \text{protected} * 0.15 + 1 = \text{connectivity score}$

Special Cases

- Channel Movement

Channel movement causing erosion, accretion, or avulsion has resulted in parcels losing land and ending up mid-channel. Although these parcels would logically be thought of as fish habitat they both assess poorly with new methodology (as they lack edge or floodplain in the 2015 SRSC habitat layers to quantify), and they might not be necessary to acquire as the channel movement may result in their having become State aquatic lands. These parcels will be marked as reviewable on a case-by-case basis and be removed from the assessment results. A new, separate shapefile was developed to catalog these parcels.

- Piano Key Parcels

Small “piano key” parcels in the mainstem floodplains (Figure 4) present potential acquisitions that will gain small and disconnected amounts of habitat often with difficult structure or restoration problems associated with them.

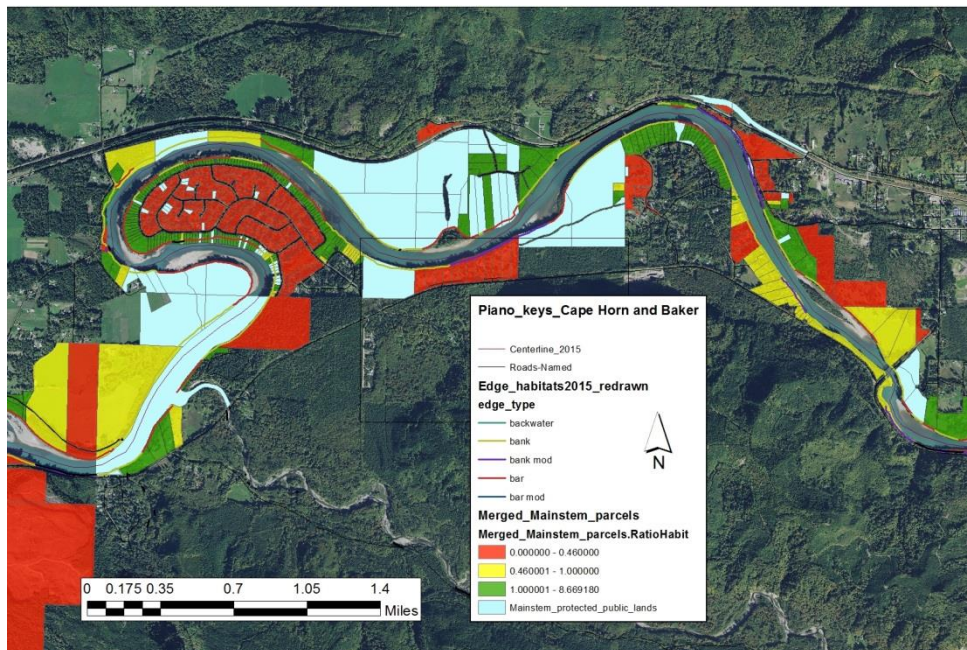


Figure 4. “Piano keys” example with scored and ranked parcels: Cape Horn and Baker Reaches

These parcels have been specifically identified, kept in the assessment results (as they include both large numbers of potentially greenlighted parcels and also large numbers of rejected parcels well below the 50% threshold, often due to isolating infrastructure features), but excluded from further consideration for use of SRFB reach level block grants. A new, separate shapefile was created to catalog these parcels.

The complete assessment results will still be available for use by other Protection Subcommittee members considering actions with other funding.

Appendix D: Tracking Form

Habitat Protection and Acquisition Form (03.21.2023)



SPONSOR INFORMATION

Organization Name	Contact Person
Restoration Partner/s if applicable	Property Avatar:

GENERAL PROJECT INFORMATION

LOCATION (water body; address, description of the portion of property proposed for acquisition using SRFB funds)

Attach Vicinity Map
 Attach Parcel Map/Air Photo
 Attach LiDAR Map
 Attach photos

PROTECTION STRATEGY SCORES

PARCEL #	ACRES	RIVER FT	HABITAT SCORE	CONNECTIVITY SCORE	Habitat Thresholds		Connectivity Thresholds	
					Main	Tributary	Main	Tributary
					>0.98903	>2.0572	>2.0741	>2.0681
					>0.45593	>1.3469	>2.0377	>2.0564
					<0.45593	<1.3469	<2.0377	<2.0564

Tier 1
 Tier 2
 Tier 2 Steelhead Only
 Multiple Tiers (explain below)

HABITAT BENEFITS (describe channels, wetlands, vegetation, benefits to fish (before and after restoration if applicable) and other justifications for purchase.)

POTENTIAL RESTORATION ISSUES

% HYDROMODIFICATION (length to edge) 0%=PS; 0-35%=TWG;	% FLOOD PROTECTION LEVEES (length to edge) 0%=PS; 0-10%=TWG; 10-100%=Board	% VEGETATION CLEARING (area) 0-50%=PS; 50-70%=TWG; 70-100%=Board	ASSOCIATED WITH PREVIOUS RESTORATION PROJECT? (in which plan and which project?)
0	0	0	
Hydromod # from USIT database:		Eventual property holder:	

ADDENDUM FOR PROPERTIES IN NEED OF RESTORATION IN ADDITION TO PROTECTION

Field Visit Conducted By:	Date:
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Remote Sensing Methods and Source:

SUMMARY OF FIELD VISIT AND REMOTE RECONNAISSANCE WITH RESTORATION PARTNERS: (Describe consensus on restoration needs (planting acres, feet of hydromod removal, number of culvert removals, amount of fill removal, etc.), list rough restoration scope and tasks for the near-term and long-term (with timeline) and provide best guess cost estimates (order of magnitude). It is understood these are best professional judgement predictions, not commitments.)

Attach draft near-term planting plan

Attach letters of support from potential restoration partners

PARCEL TRACKING:

	Steps in the Process	Date	Notes
Protection Subcommittee Process	Parcel information form received by SWC	3/7/23	
	Parcel information distributed to Protection Subcommittee (PS)		
	Reviewed by PS		
	PS greenlighted		
	Referred to TWiG		
	Referred to Board		
Cross-committee collaborative process (Protection Subcommittee and TWiG)	Initiate cross-committee process		TWiG chair and PS chair meet to agree on timeline for cross-committee process based on urgency of purchase
	Identify restoration and land holder partners		
	Preliminary field visit		
	Restoration scope of work outlined		
	Materials delivered to TWiG and/or Board		1 week prior to meeting; partner support letters, restoration plans and costs, this form, supporting maps and photos
	Reviewed by TWiG		
	Greenlighted by TWiG		
	Reviewed by Board		
	Greenlighted by Board		
	Added to 4 Year Workplan if applicable (restoration planned)		
	Follow up on conditions		