Final Notes, Skagit Watershed Council
Monitoring and Adaptive Management Subcommittee
March 27th, 2023, 9:00am to 10:30am via Zoom

(Underline indicates decision; parentheses indicate attachment #; ***bold** indicates action item)

Present: Rick Hartson (co-chair, USIT), Mike LeMoine (co-chair, SRSC), Jeff Fisher (SCL), Richard Brocksmith (SWC), Jen O'Neal (NSD), Jenn Johnson (Skagit County, guest), Catherine Austin (SRSC, guest)

Beginning Business

Introductions: Mike replaced Greg for SRSC, but Greg will be invited to review projects in the future though SRSC will still have only one vote. Jenn J may join the Subcommittee (County Natural Resources Division Director).

Reviewed Draft Agenda. All approve.

Approved notes from February 2023 (#2) **with an addition by Mike yet to come—a summary of his presentation, highlighting next steps, and a copy of the slideshow.**

Presentation from Catherine Austin of SRSC on her 2023 monitoring project proposal:

These notes were taken from a recording and Catherine was inaudible in that recording. Her slides will have to suffice for notes on her presentation. Questions that were audible are listed below:

- Do you think that the upper section will always be steeper than the middle and lower? Fish respond to depth and velocity. Can you collect gradient, and distance from the mouth as well as velocity?
- Lower gradient section is where Illabot hits the Skagit floodplain. Tenas is similar to Illabot. Goddel gradient is not analogous; it has no lower gradient section.
- Try to identify the constraints on Chinook benefits to link back to restoration planning tool.
- Is 2 years enough to get meaningful results with variability?
- Strategic Approach emphasizes spawning as function of alluvial fans. Do you plan to include redd surveys? WDFW may work with you on that. In Goddel most of the redds were near the apex of the fan.
- Catherine will pull together a budget for redd surveys.
- How will 2022 cohort of returning fish impact results?
- 600,000 outmigrants in 2022 (low). These will be returning 2025.
- Do we need to develop a predictive framework for alluvial fan habitats? A longer range goal.
- How long does/will Illabot monitoring go on? You can still use that information.
- Will there be definitions for variables that will define upper, middle and lower fan (i.e. gradient, velocity)?

- Why is this important and what do we want to use the information for?
- Will go back to the literature to define what determines upper, middle and lower fan.
- Think about ways that we could remotely analyze the 14 Tier 2 alluvial fans.
- Why were these sites your top choices?
- Are you relating fish data to cover?

Overview the Process

We will review and discuss the project and discuss conflict of interest. Mike will abstain due to conflict. M&AM has decision making authority for this proposal. It then goes straight to PSEMP. The TWG will be informed, but not approve it. They can make suggestions. This project is a small percentage of the SRFB allocation for Skagit. Asking Catherine to come back with a short brief on how she addressed comments in April. May 12th is regional presentation at PSEMP. Then it goes through the state process. This project will address data gap not discussed in the Recovery Plan.

Motion by Richard, seconded by Jen O'Neal to approve this project for funding and forward on the Puget Sound Partnership Regional process. Approved by all. Mike abstains.

Announcements

Have we heard from WDFW who may be staffing this committee? Jenny and Marcus are still trying to figure out who will be the official vote on TWG. Haven't talked about M&AM. **Mike will ask WDFW**.

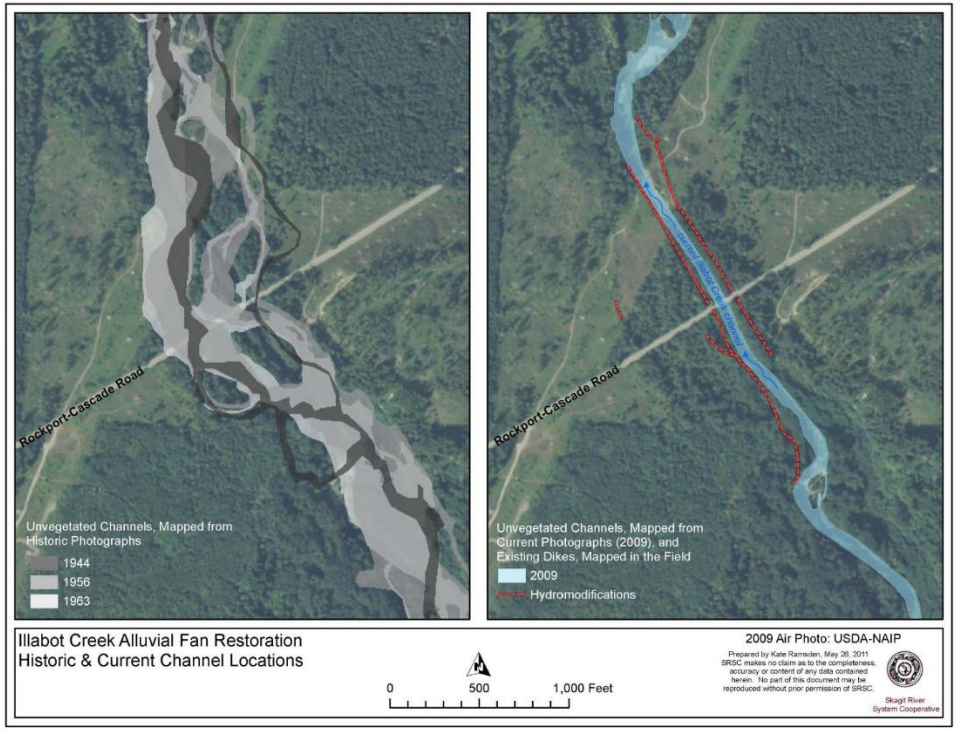
County prosecuting atty named Diking and Drainage District as salmon recovery expert in the watershed. The comanagers need to be recognized as part of the expertise. Mike is giving a training on smolt capacity estimates and will try to give other training to inform folks. There is a lot of misunderstanding and lack of knowledge.

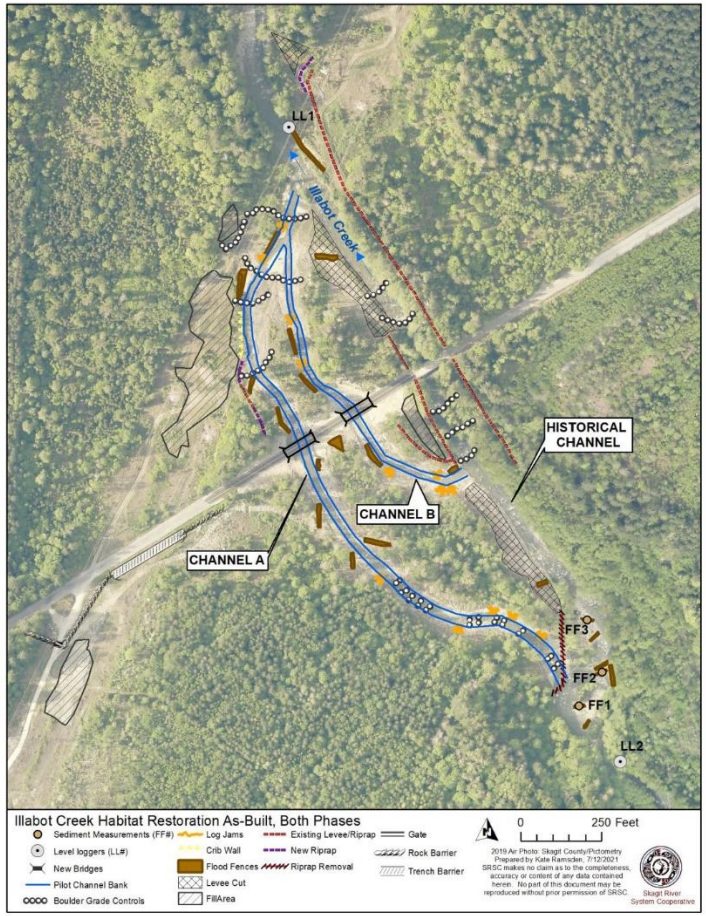
Adjourn

Fish in alluvial fans

Research funding proposal
Skagit River System Cooperative
Catherine Austin and Mike LeMoine
March 2023

Illabot Creek alluvial fan restoration





Habitat conditions

	Channel length (m)	Bankfull area (m^2)
Observed pre-project (Beamer et al. 1998)	510	6,924
Hypothesized post-project (Smith and Ramsden 2006)	-	18,452
Observed one year post-project	1,447	14,842
Observed two years post-project	1,507	18,944

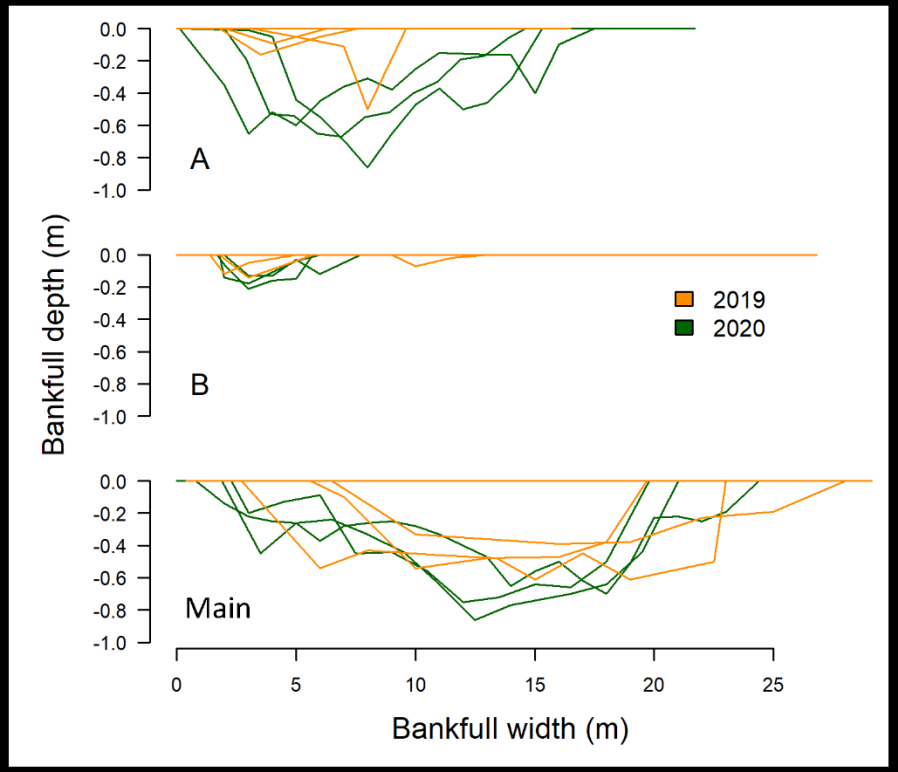
Channel development

Channel depth profiles

Wood accumulation at ELJs

Sediment accumulation at flood fences

	Number of fully wetted channels – summer
Pre-project	1
One year post-project	1
Two years post-project	2



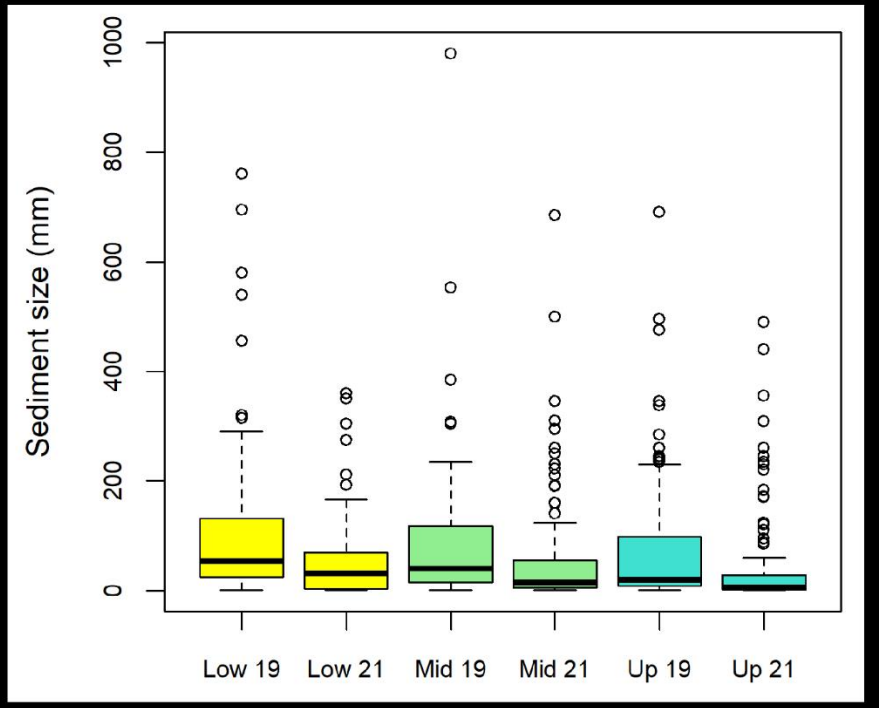
Bankfull cross sections at haphazard locations, three channels, one year and two years post-restoration.

Channel development

ELJ formed pool with wood accumulation, channel A, July 2021.

Pre-project reach wood= **5.7 pieces/100 m**

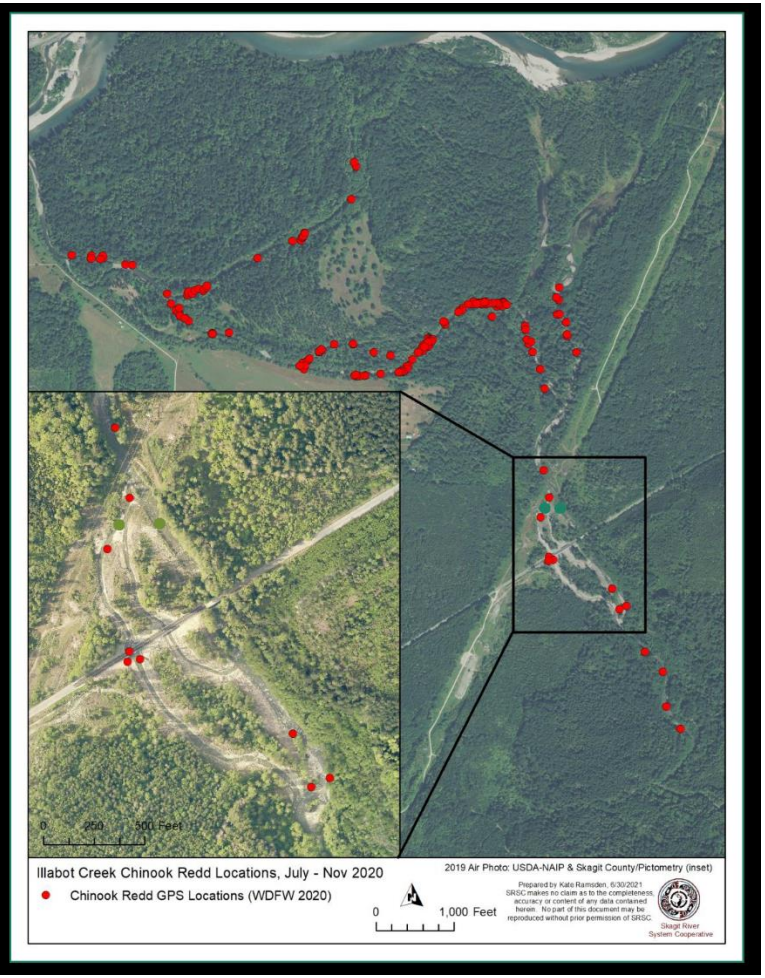
Post-project reach wood= **16.9 pieces/100 m**



Three monitored flood fences, main channel, 2019 and 2021.

Chinook spawning

	Redds in project reach	Redds/km in project reach	Redds in Illabot Creek	Redds in project reach/redds in Illabot Creek
Pre-project	3	6	223	0.013
One year post-project	0	0	35	0
Two years post-project	8	5.3	170	0.047



Juvenile salmon rearing estimates & densities

Chapman modified Lincoln-Peterson estimates and densities (fish/m^2 ± SD) from mark-recapture data expanded to the project reach based on measured habitat area

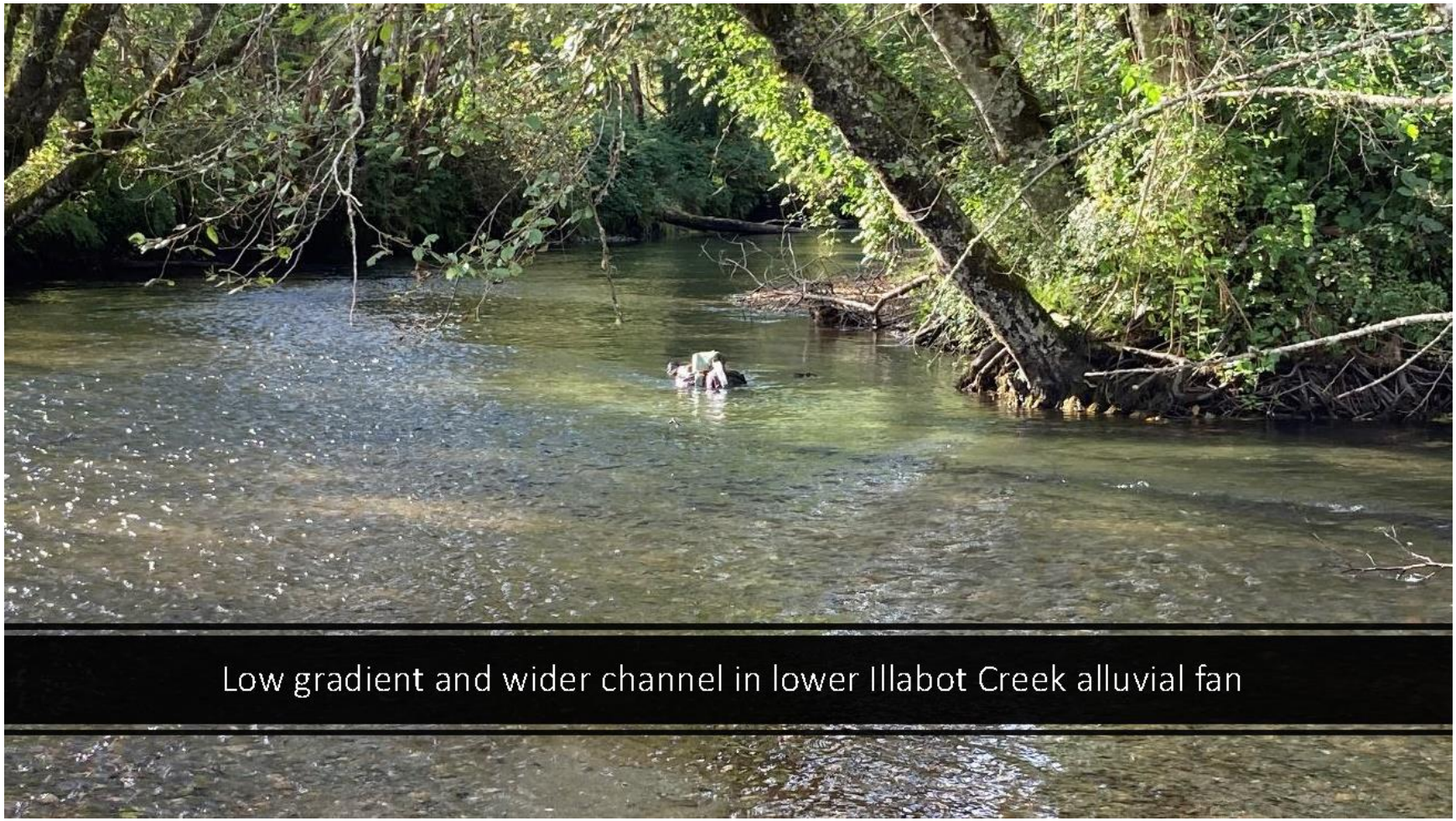
	Summer coho parr	Summer *O. mykiss* parr	Winter *O. mykiss* parr	Summer Chinook parr
One year post-project	884 ± 106 0.066 ± 0.010	Too few to estimate	255 ± 45 0.017 ± 0.003	Too few to estimate
Two years post-project	313 ± 39 0.018 ± 0.002	480 ± 20 0.027 ± 0.001	1937 ± 723 0.102 ± 0.038	No fish observed
Three years post-project	103 ± 49 0.006 ± 0.003	202 ± 64 0.012 ± 0.004	TBD	65 ± 29 0.004 ± 0.002

Skagit Chinook Recovery Plan Appendix C

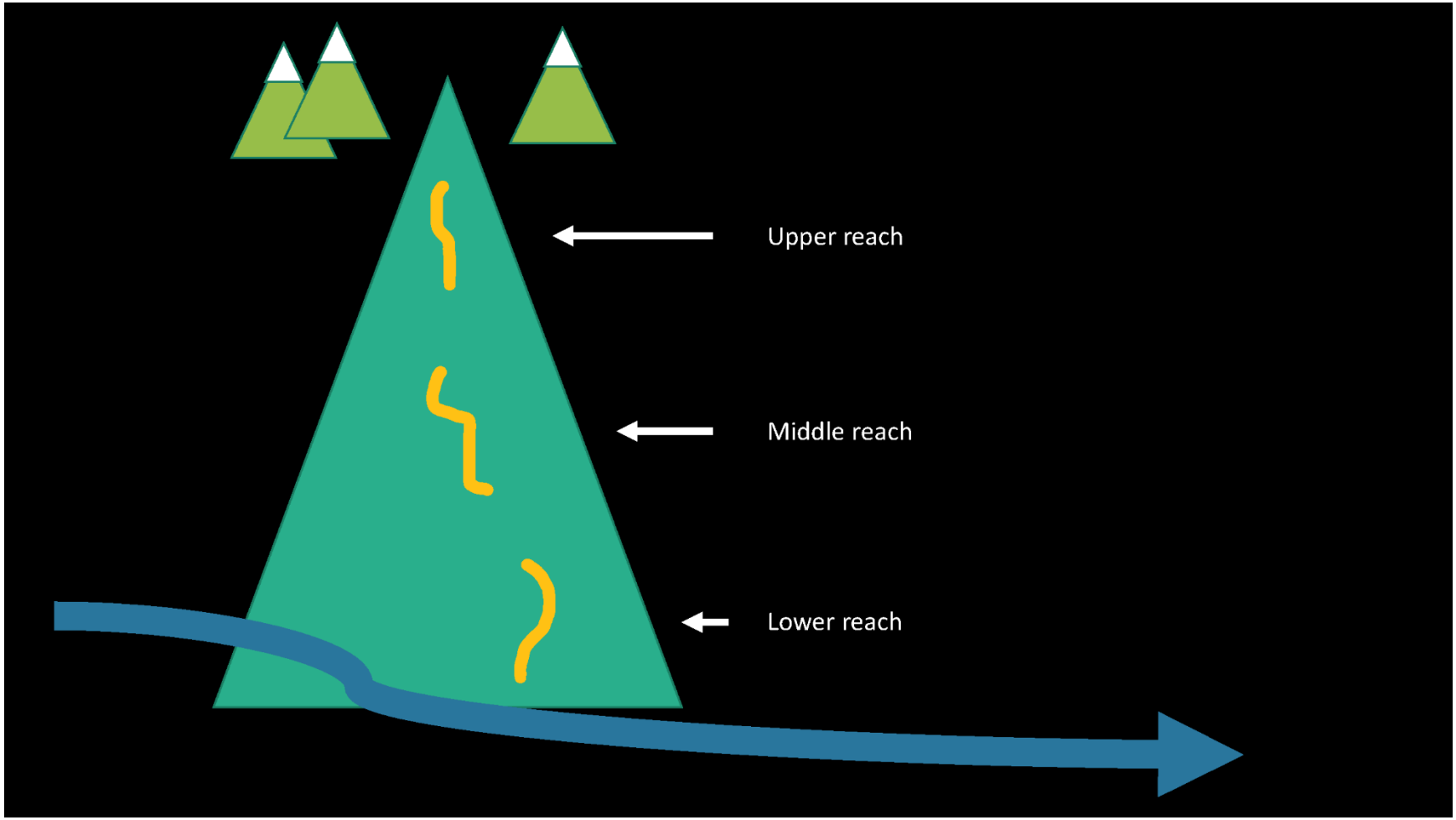
Assumed capacity for parr migrant Chinook salmon by habitat type for large rivers (channels >50 m wide)

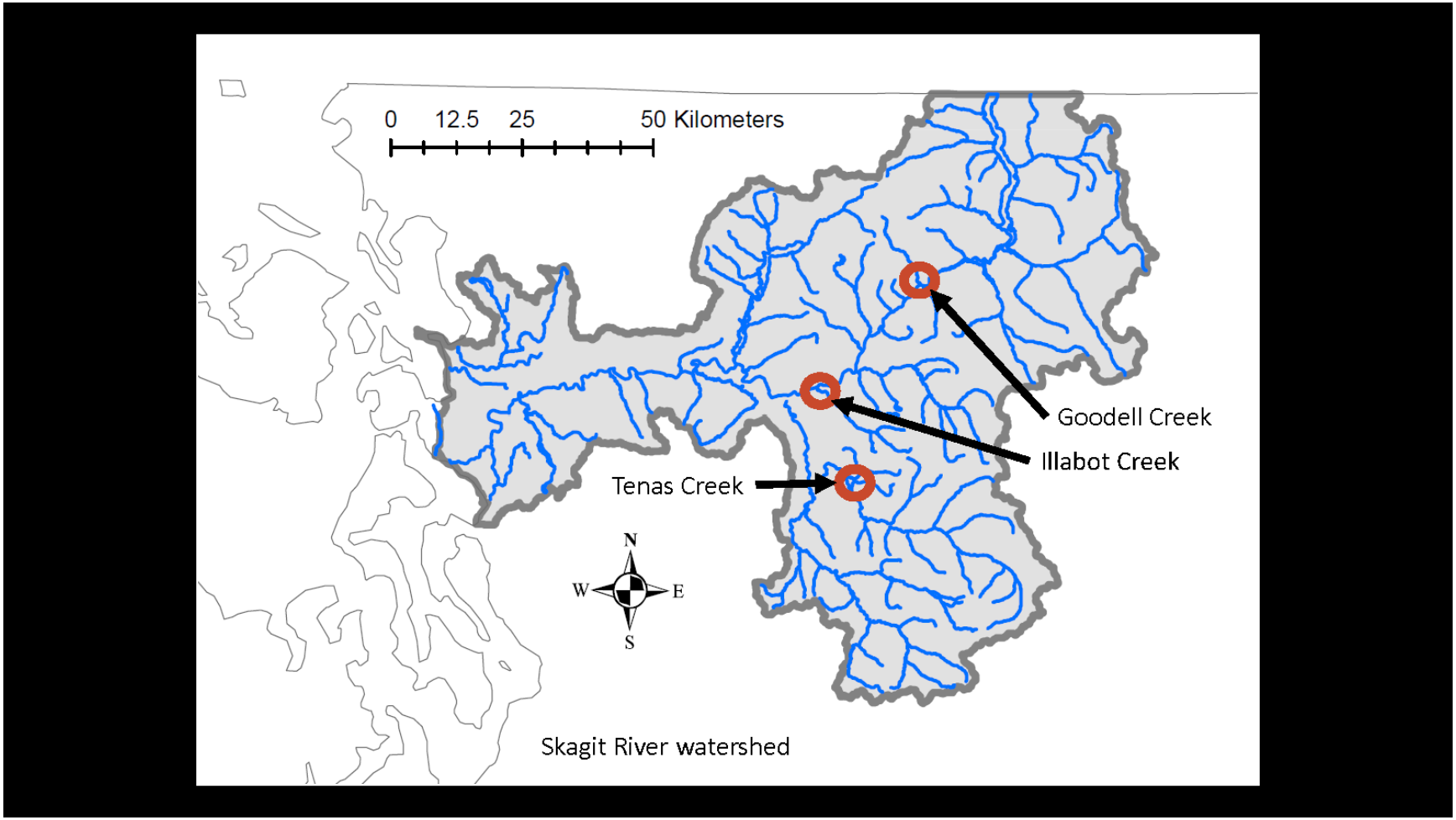
	Chinook/m^2
Natural backwater	1.780
Hydromodified backwater	0.639
Natural bar	0.440
Hydromodified bar	0.158
Natural bank	0.970
Hydromodified bank	0.348
Mid-channel areas	0.001
Off-channel habitat	486 (per hectare)

Moderate-low gradients and braided channels in upper Illabot Creek alluvial fan



Low gradient and wider channel in lower Illabot Creek alluvial fan


Upper reach
Middle reach
Lower reach


0 12.5 25 50 Kilometers
Goodell Creek
Illabot Creek
Tenas Creek
N
W
E
S
Skagit River watershed

Hypotheses

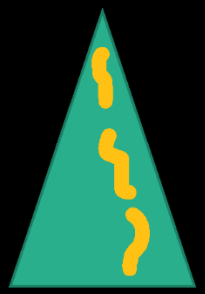
H_{a1}: The fish community in the upper reach of each alluvial fan will be dominated by juvenile Steelhead/Rainbow Trout, with relative juvenile Chinook Salmon density more similar to stream capacity estimates.

H_{a2}: The fish community in the lower reach of each alluvial fan will have higher juvenile Chinook Salmon representation, with relative density more similar to [floodplain] backwater capacity estimates.

H_{a3}: The fish community in the middle reach of each alluvial fan will be dominated by juvenile Coho Salmon, with intermediate relative juvenile Chinook Salmon density.

H_{a4}: Habitat characteristics including width, residual pool depth, and Tier 2 CGU classification will differ among the three reaches in each alluvial fan.

Methods



Extent

- Three alluvial fans – upper, middle, lower reaches
- Two years, seasonal low flow periods (winter before snowmelt; summer before fall floods)

Habitat sampling

- BFW, WW, reach length, residual pool depth
- LW enumerated and characterized by size class
- Tier 2 CGUs (Hawkins et al. 1993), also classified by categories in SCRP Appendix C

Fish surveys

- Single pass electrofishing to enumerate and identify juvenile salmonids/resident stream fishes

Proposed budget

- Budget match $8,000

Salaries and fringe	Total
Director	$1,123
Biologist	$13,276
Field Technicians	$16,200
GIS Specialist	$3,370
Subtotal	$33,969
Supplies and services	
Vehicle rental	$600
Vehicle O&M	$1,670
Efisher rental	$720
Supplies	$2,450
Subtotal	$5,440
Indirect	$10,542
Total	**$49,951**

Funding rationale

- SWC 2015 Strategic Approach Tier 1 priority for "floodplain-adjacent alluvial fans of the Skagit and Sauk Rivers that provide rearing habitat for multiple Chinook populations"
- Literature finding "the junctions between tributaries and mainstem channels where alluvial fans are formed to be biological "hot spots" for habitat diversity and salmon utilization (Kiffney et al. 2003)"
- Skagit Chinook Recovery Plan (SRSC and WDFW 2005), Illabot Creek and other alluvial fan restoration projects, completed and not
- SWC 2016 Interim Steelhead Strategy Tier 2 "single stock large river floodplain"
- Consistent with SRFB criteria and strategies in SWC 2023 RFP

Juvenile salmon rearing – raw catch

Total raw counts from backpack electrofishing encounters in channels A and B

		Coho salmon	*O. mykiss*	Unidentified juvenile trout	Chinook salmon	Sum of catch
2019	July/August	268	5	60	2	335
	December	11	159	0	0	170
2020	February	0	59 (67 ± 15)	0	0	59
	September	195	306	117	0	618
2021	January	11	122	0	0	133
	August	49	57	3	18	127
Sum of catch		534	708	180	20	