WASHINGTON STATE Recreation and Conservation Office

Project Review Comments

PROJECT: 22-1089 P, Race Lagoon Passage - Culverts #1893 & 1894

Sponsor: Skagit Fish Enhancement Group Program: SALMON ST PROJ Status: Board Funded

MEETING: Initial Review

Shared: 4/1/2022

Review Status: Project of Concern (POC)

Topics	Comments
Review Status - Initial	
POC Criteria	
	4. The project has a high cost relative to the anticipated benefits and the project sponsor failed to justify the costs to the satisfaction of the SRFB Review Panel.
	8. It is unclear how the project will achieve its stated goals or objectives.
	6. The project may be in the wrong sequence with other habitat protection, assessments, or restoration actions in the watershed.
Review Panel Comments - Initial	
Questions (response required)	
	Please describe how the site meets the juvenile Chinook use relationships identified in Beamer et al. (2013) (e.g., distance to natal river, slope, and watershed size). This may be part of the prioritization process for the barrier prioritization project 19-1343, but the prioritization criteria and rankings have not been provided in the proposal. If the criteria and ranking are available, please provide them for this project
	Reply: The barrier prioritization process is still ongoing at the time of this application, however, SFEG, Island County public works, and local tribal biologists have made significant progress with this process. After a majority of the culvert assessments were completed, these stakeholders met to evaluate the barrier culverts and prioritize reaches for habitat surveys and Culvert Assessment Forms (CAFs). Stakeholders considered biological and human factors as a part of this process. Sites with known political, legal, or landowner permission problems that would prevent a restoration project in the foreseeable future were excluded. The remaining known barrier culverts with no known political, legal, or landowner barriers to restorations were prioritized for further data collection based on the potential quality and quantity habitat gain/improvement. Streams with fish passage barriers on them were evaluated based on research criteria including: documented juvenile Chinook presence, watershed area, low stream gradient, distance from natal river mouths, and presence or absence of a pocket estuary. In this initial evaluation, based on these criteria, the Race Lagoon culverts ranked in the highest priority category. The criteria used to evaluate potential project sites originated from the 2013 small streams study (Beamer et al 2013). This study found that Chinook abundance was positively associated with watershed area. Watersheds below 45 hectares were not associated with Chinook use, larger watersheds tended to have more salmonid rearing. In the same study, stream slope was negatively associated with salmonid rearing. Salmonids were not found in streams with a gradient greater than 6.2% and lower gradient streams were preferred. Salmonid abundance was negatively associated with distance from a large river mouth (Skagit, Stillaguamish, Snohomish Rivers), this was a leading factor in designating salmon recovery priority areas, this

project is in Geographic Priority area 2 which is a “medium” recovery area. Race Lagoon is part of the Saratoga Pass portion of geographic priority area 2. According to the WRIA 6 (Whidbey & Camano Islands) Multi-Species Salmon Recovery Plan “The Saratoga Passage and Possession Sound shorelines and sub-basins were included because they are within the Whidbey Basin, which is an area that has been regionally recognized as important to all south and central Puget Sound stocks.” The multi-species recovery plan focuses not only on Chinook but also benefits to other salmon, such as coho and chum salmon which would benefit from restoration of small stream habitat. Finally, the small streams study found that Whidbey Island pocket estuaries and coastal streams, were both associated with high juvenile salmonid usage, especially in March and April when the density of juvenile salmonids peaks throughout the region in delta and estuary habitats. Race Lagoon has known Chinook use, has a watershed area of 292 hectares, is located within the 25 km from natal river mouths where Chinook fry utilize small streams, and the stream gradient with the first 200 meters of 1893 is a slope of 2-3%, and 1.5-2% within the first 200 meters of 1894, within the 2% gradient where most juvenile Chinook were found in the small stream study.

Lack of rearing habitat is a known limiting factor to Skagit Chinook recovery stating, “The loss of rearing habitat quantity and quality along mainstems, within the estuary, and in the nearshore environment is thought to be one key reason for the decline of Snohomish River basin Chinook salmon.” (Snohomish River Basin Salmon Conservation Plan 2005). According to the Stillaguamish Watershed Chinook Salmon Recovery Plan a lack of estuary rearing habitat is a limiting factor for Chinook, “In addition to the salt marsh estuarine habitat connected to the Stillaguamish River, nearshore areas in Port Susan and Skagit Bay historically included a number of “pocket estuaries” that provided additional estuary rearing habitat for juvenile salmon….The loss of pocket estuary habitat throughout Puget Sound has likely had a significant impact on the fry migrant life history type of Chinook salmon…Many factors have contributed to the loss of estuarine and nearshore habitat, including: construction of dikes and the associated loss of salt marsh habitat and blind tidal channels; installation of tide-gates, flood-gates, pump-stations, weirs, and culverts.” Removing fish passage barriers which block access to rearing habitat and prevent fully functioning pocket estuary habitat is a critical action for Chinook recovery for Chinook stocks for all these systems.

It is relatively well known that pocket estuaries are important rearing habitat for Chinook salmon and other salmonid species. According to (Beamer et al 2013) “Skagit River tidal delta and pocket estuary habitats are much smaller and more fragmented than historically (Beamer et al. 2005), which is a theme for all Whidbey Basin River and pocket estuaries (Collins 2000; Collins & Sheikh 2005). At contemporary Skagit Chinook salmon population levels, current estuary habitat conditions are limiting the number and size of juvenile Chinook salmon rearing in delta habitat, as well as displacing them to Skagit Bay habitat, forcing a change in their life history type from delta rearing to fry migrants (Beamer et al. 2005; Greene & Beamer 2011). Because some fry migrant Chinook salmon rear and take refuge in pocket estuaries, restoration of pocket estuary habitat can be a strategy to partially mitigate delta density dependence and improve survival of naturally occurring fry migrants. Thus, local salmon recovery plans (e.g., Skagit Chinook Recovery Plan, Island County Multi-species Salmon Recovery Plan) included protection and restoration of pocket estuaries within the Whidbey Basin as an important strategy.

The regional nearshore chapter of the Puget Sound Chinook Recovery Plan (Redmond et al. 2005) also emphasized the importance of pocket estuaries." This study found "growth rates of individual juvenile Chinook salmon in small streams to be similar to the growth rates of juvenile Chinook salmon in pocket estuaries and tidal delta scrub shrub habitat. Based on these results, suggesting that independent small coastal streams have the ability to provide fry migrant Chinook salmon with suitable rearing habitat during the same period when many juvenile Chinook salmon are rearing in natal or pocket estuaries, thus providing habitat diversity opportunity for Chinook salmon populations with fry migrants."

In addition to coastal streams being important rearing habitat, undisrupted flow of fresh water into pocket estuaries is beneficial for juvenile salmon during the critical period of smoltification. According to Beamer et al 2013 "It is likely that the fresh water in the stream serves an important function – osmoregulation – and that these independent small coastal streams could be considered a physiological refuge for juvenile Chinook salmon (as suggested by Redmond et al. 2005)." This is one of the reasons that human impacts on physical processes are a high priority for estuary restoration.

In the Habitat and Fish Use of Pocket Estuaries in The Whidbey Basin and North Skagit County Bays, 2004 and 2005 report, Race Lagoon was listed as accessible to Chinook from the Skagit, Stillaguamish and Snohomish rivers. The Juvenile Salmon and Nearshore Fish Use in Shallow Intertidal Habitat Associated with Race Lagoon, 2006 and 2007, report found Chinook in Race Lagoon in all years where seining took place as well as other salmonid species, predominantly chum and pink. Maximum rearing density was estimated to be 306 Chinook salmon per hectare of area seined. In another study that took place in Race Lagoon, the Habitat and Fish Use of Pocket Estuaries in The Whidbey Basin and North Skagit County Bays, 2004 and 2005 their sampling found an average of 859 juvenile salmon per hectare inside Race Lagoon and an average of 25,000 juvenile salmon per hectare at Race Spit.

Finally, the small streams study (Beamer et al 2013) concluded that streams that do not have culverts at their mouth have higher juvenile Chinook salmon presence rates than streams with culverts at their mouth that do not backwater at high tide. Streams with culverts at their mouth that do not backwater at high tide have lower juvenile Chinook salmon presence rates than streams with culverts that backwater at high tide. Streams without culverts have juvenile Chinook salmon presence rates similar to streams with culverts that backwater at high tide. In addition, the limiting factors for salmon recovery in WRIA 6 were identified in the Salmon Habitat Limiting Factors Report (Washington State Conservation Commission 2000). This report identified limiting factors on habitat due to Human Impacts on Physical Processes (sediment transport, tidal exchange, and hydrologic cycles) Including 1) Altered stream sediment transport due to upland land use practices and channel alterations due to culverts, and loss of riparian large woody debris and 2) Altered tidal exchange due to existing or new shoreline modifications (filled wetlands and dredged channels) and tide control structures (dikes, tide gates, wetland and stream outlets confined to culvert outfalls).

In summary this project was selected due to multiple factors. This stream was

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	evaluated by tribal biologists, the local Island County lead entity and Skagit Fisheries Enhancement Group and ranked highly due to both habitat quality/potential gain and project feasibility. Multiple studies have found high salmonid rearing in this estuary and recent research shows seasonal coastal streams have the ability to provide fry migrant Chinook salmon with suitable rearing habitat (or preferred habitat for juveniles who still require the osmoregulation benefits of a habitat with both fresh and saltwater inputs) and support growth rates of individual juvenile Chinook salmon similar to the growth rates of juvenile Chinook salmon in pocket estuaries and tidal delta. The current culverts on the two unnamed Race Lagoon streams prevent full tidal exchange and backwatering and are a barrier to juvenile salmon. Our field crews observed the impacts of this when a stranded juvenile Chinook was found stranded above the culvert after a high tide event, unable to pass back through the culvert back to the estuary. This project will remove these undersized culverts to restore natural sediment transport rates, tidal exchange regimes, and hydrologic cycles to allow salmonid access to the upstream channel and access all of the benefits of a functioning pocket estuary habitat.
	The sponsor indicated that the landowner at culvert 1893 has been willing to engage in the project in the past, but the property is now listed for sale. Did the sponsor approach the landowner about doing any instream habitat improvement upstream of the culvert?

	Reply: There are 3 parcels with 3 landowners immediately upstream of 1893 who together own the first 1500 feet of stream. The first landowner immediately upstream of 1893, Mike and Michelle Aube, own the first 250 feet of stream on their property at 512 Race Road. They are very interested in restoring the upstream habitat and stated this an email exchange with our staff. When planning channel work and planting they asked that we also incorporate benefits to birds. The next upstream landowner, Terry Smith, is a minority owner of this stream. They own the next110 feet of stream on their parcel number R23107-269-3220. This parcel is currently for sale. This landowner lives off site, but SFEG staff were able to get ahold of them in May 2022 to discuss future restoration. This landowner said they would be willing to review proposals including more details about channel restoration; they would also be interested in selling their land for conservation. SFEG forwarded this information to the local Land Trust. Finally, the next upstream landowner owns 1145 feet of low gradient stream habitat and is interested in restoration work along the stream. The first 520 feet of the main channel of the unnamed tributary upstream of culvert 1894 runs along the property line of two parcels. These two landowners are very supportive of both channel improvements and planting. One of these landowners, Eric Mader, is an entomologist. He uses this Race Road property to cultivate rare and valuable native wildflowers for use in meadow restoration projects and he is currently partnering with multiple conservation districts to research “working riparian buffers” on this property. He is interested in additional riparian planting as well. Eric was present at the 2022 SRFB site visits and reported that 1) he has observed salmon in the channel along his property and 2) he requested that we re-meander the channel along his property to improve the habitat for salmon. The neighbor who owns the other bank of the main channel, as well as a small tributary to the mainstem, is Jim Nagel. Jim has expressed support for channel work and planting on his property on numerous occasions and been instrumental in assisting SFEG staff with successful outreach to the rest of the neighborhood in support of this project. In June 2022, SFEG staff also made contact with the landowner at the upper most reach of the 1894 mainstem, Zach Street, owner of 366 Denneboom Road. Although his property is too far away to expect juvenile salmon usage on his property, additional stream side planting may be beneficial to salmon due to water quality benefits. SFEG will consider the cost/benefits of converting his field to forest as part of a salmon habitat enhancement effort on this stream.
Improvements to Make Project Technically Sound (response required)	
	Given the concerns identified above and below, the review panel does not believe that there is anything that the sponsor can do to get the project cleared as scoped in this grant round. The following comments are offered in case the sponsor wishes to appeal the POC and the lead entity and region support an appeal. Sponsor must respond to the following comments if they wish to appeal. Project must have a preliminary design loaded to PRISM in order to be eligible for construction grants requesting $250,000 or more in SRFB funds.
	Reply: Project is now Design Only so will develop preliminary designs in preparation for construction within 2 years of final design and permitting. The cost is less than $250,000.

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	At culvert #1894 a downstream fish barrier due to drop (and probably velocity) was observed during field review of which sponsor was unaware. Located just below the small footbridge, this barrier was created by incision which occurred since sponsor was last on the property. The preliminary design will need to address this barrier or the project is a non-starter. A meander at this location will likely be necessary to accommodate the amount of drop observed on site.
	Reply: The updated proposal will include a design to remove the private crossing downstream (RFEG053) and re-meander the channel through the existing trees to eliminate this drop.
	Preliminary designs should also specifically consider and address the watershed hydrology and demonstrate that the design can accommodate the flows and velocities within the drainage.
	Reply: The design will include analysis of hydrology to ensure the proposed structures will accommodate flows and velocities within the drainage.
	A comment was raised during the field review that a single crossing could be considered when evaluating options. The Review Panel believes that maintaining two channels is preferable, but this is the sort of thing that should be explored through hydraulic analysis and evaluating alternatives when preparing the preliminary design. If a single crossing were considered, a bridge would most likely be necessary and Island County has expressed reluctance to use bridges. The additional cost of a bridge of suitable size could also probably not be justified by the expected fish benefit at this location.
	Reply: The design will include analysis of hydrology. In addition, StreamStats run by Chinook Engineering indicate two watersheds are present so two culverts would be appropriate.
	If sponsor is not able to produce preliminary designs prior to the application deadline, the grant request will have to be for design only. While the Review Panel would be open to a final design, we think a preliminary design level may be more appropriate, with the expectation that it would be followed by a final design/build in a subsequent grant round. We believe this approach may result in less re-designing when it comes time to seek construction funding, given the pace at which conditions are evolving in this drainage. If there is a gap in time between completion of the final design and receipt of construction funds, a lot can change on the ground in this rapidly evolving, tidally influenced setting.
	Reply: This grant application has been changed to an 18-month Design Only grant.
	If this application is scaled back to design only and if feasible, you may want to consider an 18-month design grant. This would allow you to accelerate the project and the requirement for match would be waived (See Manual 18, p 14 to ensure that you meet the criteria). Given the pace of changes in the system and the strong local support, we do not think a feasibility assessment or standalone alternatives analysis grant for this project is necessary, nor would best serve the project objectives. Additionally, of the two areas in the project, the habitat above culvert # 1893 appears to have the most potential for providing access to usable habitat for juvenile salmonids. Though the current habitat is not in great condition as this time, it does appear to have potential for improvement and improving the connection between the stream and the lagoon is less troublesome than at #1894. It would be best to have the landowner on board to make instream enhancements at the same time the culvert is upgraded.

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	Reply: This grant application has been changed to an 18-month Design Only grant. Upstream enhancements included in this design project include development of a preliminary planting plan upstream of both culverts 1893 and 1894. Although upstream habitat is not highest quality, it is still functioning and should not preclude efforts to increase connectivity with the pocket estuary
General Comments (response not required)	
	RCO Cultural resources staff comments- A preliminary review by RCO cultural resources staff found a high risk that project activities will impact protected cultural resources. Cultural resources survey and monitoring are likely to be needed, and a state archaeological excavation permit, or federal MOA may be needed. This is a limited, high-level review that looked at factors like location, landform features, known archeological sites, and ethnographic sites. RCO cultural resources staff will initiate tribal consultation and complete a more detailed review when projects are ranked in anticipation of funding. Any changes in the planned project activities may change the cultural resources analysis and degree of work required. Most applications should include a line-item for cultural resources costs. The costs for a survey are dependent on the scope, scale, and location of your project. We encourage you to reach out to cultural resources consulting firms to assist in budgeting or conducting a pre-review. If any prior cultural resources studies have been completed for your project area, please reference the DAHP project identification or prior RCO project by number.
	Reply: SFEG has included the cost of cultural resources assessment for this phase of the project.
	POC Criteria #4. High cost relative to anticipated benefit. There is currently low fish use in the streams below the culverts, the streams are often, if not always, seasonal and the habitat upstream of both culverts is of poor quality. The anticipated functional lift to nearshore and instream fish habitat is thus limited. With costs over $870K to construct both culverts (before the additional design element of the downstream drop barrier below the footbridge is considered), the cost for implementation is high relative to the anticipated benefit. If additional fish surveys were able to demonstrate higher fish use below the culverts, this would strengthen the argument for correcting passage at this site.

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	Reply: Fish use in Race Lagoon is well documented. In the Habitat and Fish Use of Pocket Estuaries in The Whidbey Basin and North Skagit County Bays, 2004 and 2005 report, Race Lagoon was listed as accessible to Chinook from the Skagit, Stillaguamish and Snohomish rivers. The Juvenile Salmon and Nearshore Fish Use in Shallow Intertidal Habitat Associated with Race Lagoon, 2006 and 2007, report found Chinook in Race Lagoon in all years where seining took place as well as other salmonid species, predominantly chum and pink. Maximum rearing density was estimated to be 306 Chinook salmon per hectare of area seined. In another study that took place in Race Lagoon, the Habitat and Fish Use of Pocket Estuaries in The Whidbey Basin and North Skagit County Bays, 2004 and 2005 their sampling found an average of 859 juvenile salmon per hectare inside Race Lagoon and an average of 25,000 juvenile salmon per hectare at Race Spit. In addition, SFEG is planning to collect additional information on fish presence through seining once our last scientific collection permit is approved in the next couple months (July or August 2022).
	POC Criteria #8. Uncertain that project will achieve goals and objectives. While the current landowner adjacent to culvert 1893 is supportive of the project, they have put the parcel up for sale. This introduces uncertainty for how the project could proceed and the extent to which upstream habitat could be restored. This stream appears to have the best value as potential fish habitat and it is premature to bring this project for funding given the uncertainty with this landowner.
	Reply: Upstream landowners have been contacted and are interested in restoration activities such as riparian plantings and in-stream habitat improvements. These streams met the small stream criteria for presence of Chinook, watershed size, gradient, distance to river mouth, and presence on a pocket estuary. Stream restoration work would focus removal of invasive blackberry and riparian planting with potential for stream re-meandering above culvert 1894 as a future phase.
	POC Criteria #6. Out of Sequence. 1) The preliminary design and basis of design report for all barriers, including the drop barrier below the private footbridge, need to be loaded to PRISM to be considered for construction funding because the request is >$250K. 2) The willingness of the landowner adjacent to culvert 1893 support restoration activities on their property needs to be established before the value of the upstream habitat can be evaluated. 3) It would be useful to see what additional information comes out of the Culvert Prioritization Inventory (19-1343) and in particular, if any Priority Area #1 sites could be tackled before these Priority Area #2 sites.
	Reply: This project has been changed to Design Only.
	Sponsor has done an exceptional job of coordinating with the County and reaching out to landowners. Nice work building on other nearby restoration projects.