# 2013 Project Proposal for Planning Projects (Assessment, Design, and Study) and Combination Planning and Acquisition Projects, Excluding Barrier Inventories

1. **Problem Statement**

**Provide an overview of fish resources, current habitat conditions, site or reach conditions, gaps in knowledge, and other key salmon recovery problem(s) in the watershed that this project is intended to address.**

Edmonds Marsh is a 28-acre remnant of a historical 100+-acre barrier estuary and marsh complex located a short distance from the downtown area in the suburban City of Edmonds. Edmonds Marsh is one of the few remaining such ecological features in the Central Puget Sound basin. Research indicates that barrier estuary habitats, such as this, are an important habitat type for Pacific juvenile Chinook salmon (Fresh, 2006; Beamer, 2006) and significant losses of this particular habitat type have occurred along the WRIA 8 shoreline (Williams et al, 2001; Leschine, T. and AW Petersen, 2007). Several studies specifically call out the need for restoration of barrier estuary complexes as a critical component to Chinook recovery (Redman, S, 2005; Beamer, 2006), including the 2012 Puget Sound Partnership Action Agenda.

This project addresses a key salmon recovery issue of limited juvenile access to important, yet rare, nearshore rearing habitat. The goal of the project is to improve the connection between Edmonds Marsh and Puget Sound to provide juvenile salmon access to intact estuarine rearing habitat. This project represents a unique opportunity to increase the diversity of nearshore habitat types available to juvenile Chinook along the highly degraded WRIA 8 shoreline.

Historically, Edmonds Marsh and the contributing creek watersheds likely supported several salmon species and life stages, including juvenile Chinook and coho salmon in the marsh system. The current conditions significantly limit fish access, and there is no recent evidence of non-natal juvenile salmon rearing in the marsh. Daylighting Willow Creek and addressing additional restoration design issues on and adjacent to the site, will allow for expanding and enhancing juvenile salmon rearing and secondarily adult coho spawning, as well as enhance the existing cutthroat populations.

*Description of the passage problem:* The current outlet of the marsh is via a combination of a narrow, steep ditch and a 1,600’ long system of buried pipes and vaults that empties into Puget Sound at approximately -8.0’ MLLW. A flap tide gate is present mid-way along the pipe outfall system. The tidegate operation is mostly closed during winter months (mid-October through mid-March) limiting tidal inflow and fish access. The gate is held open mid-March through mid-October. This existing system is a nearly complete fish access barrier. In addition, the existing system interrupts the natural delivery of freshwater, organic matter (detritus), and prey organisms to the shoreline of the Puget Sound. Thus, juvenile Chinook salmon and other species migrating and rearing in the shallow waters along the shoreline do not benefit from the current inputs of the marsh system.

*Description of amount and quality of habitat available*: Currently, approximately 10 acres of the accessible 28 acre marsh is a combination of mudflat and saltmarsh habitat (see Existing Conditions map in the attachments) that would support juvenile Chinook rearing. A detailed plant species composition study of the marsh is planned for summer 2013 (with funding provided by a Royal Bank of Canada Foundation grant to EarthCorps). The remaining 18 acres of marsh are dominated by cattails. Previously existing channel networks from the creeks to the estuarine portion of the marsh has been overgrown by cattails and no channels exist currently.

1. **Project Purpose**
   1. **State the project goal(s).**

The goal of the *overall* project is to restore tidal inflow and to improve fish passage conditions into Edmonds Marsh, by daylighting Willow Creek. The Early Feasibility Study (completed in May 2013 and funded by RCO) indicates this restoration action will provide improved access to up to 28 acres of estuarine marsh habitat suitable for juvenile Chinook salmon. Additional benefits include increased connectivity to upstream spawning for other salmonid species, such as Coho.

The goal of the current project phase, Final Feasibility, is to address the remaining technical and social aspects of the project prior to entering into design work.

* 1. **List the project’s objectives.**

The objectives of the current phase are to build upon the results of the Early Feasibility Study to finalize feasibility of this project by:

* Evaluate marsh outlet configuration(s) across the beach that would allow for juvenile fish access to the marsh during much of the spring and summer nearshore rearing period
* Evaluate the need for structural measures in the daylight channel to improve fish passage conditions in the marsh entrance channel and across the beach (i.e., reduce potential for outlet closures) and/or protect property and local infrastructure from daylight channel migration
* Determine the need for a self-regulating tide gate in the proposed daylighted channel to protect from coastal flooding sources
* Assess the availability of the Unocal property for a daylighted channel and planted buffers by engaging local property owners including Unocal/Chevron, WSDOT Ferries Division and BNSF Railway

1. **Project Context**
   1. **Describe the location of the project in the watershed**

Edmonds Marsh is a remnant barrier estuary located in the nearshore of the Lake Washington/Cedar/Sammamish watershed (WRIA8) and within the City of Edmonds in the Central Puget Sound basin. The immediate extent of the project is west of SR 104, south of the Port of Edmonds Harbor Square business park, east of the Port of Edmonds Marina and BNSF railroad, and west of the former Unocal/Chevron property (see location map attached in PRISM project number 11-1553).

* 1. **List the fish resources present at the site and targeted by this project.**

1. Recent research on juvenile Chinook salmon usage of non-natal creek mouths and pocket estuaries indicate a high likelihood that juvenile Chinook will use the Edmonds Marsh/Willow Creek mouth habitats, if made accessible. In the Skagit River estuary and adjacent marine nearshore, Beamer et al. (2003) found that between February and May, more juvenile Chinook salmon used pocket estuaries than other nearshore areas. This research documents the preference of juvenile Chinook to utilize available pocket estuary habitats and their movements into these habitats from nearshore. More recently and closer to this project location, Todd Zackey of the Tulalip Tribes led an investigation of juvenile salmonid use of the lower reaches of small, non-natal tributaries in Puget Sound’s Whidbey basin. The study documented juvenile Chinook in 16 of 18 streams sampled (Zackey et al. 2011). During the preparation of the Early Feasibility Study for this project (11-1553), Zackey also provided related site-specific information regarding fry presence based on gradient. He indicated that Chinook fry presence was observed in low gradient areas at the mouths of small streams. In addition, Zackey’s research on fish distributions in coastal streams along the eastern Central Puget Sound shoreline indicate that a key limiting factor to juvenile Chinook use of coastal stream mouths are railroad culverts. Comparatively, in the case of barriers, Triangle Cove on Camano Island, which is fish passable and not impeded by the railroad or otherwise, juvenile Chinook use not only the brackish portions of the pocket estuary, but also the lower reach of the stream (Zackey, 2013).

The Willow Creek Daylight project is located 16 miles south and 8 miles north of the Snohomish River and Cedar/Sammamish watershed mouths, respectively. The Creek is within the range of documented juvenile fish migration and use. Given these documented studies, and data provided in the Early Feasibility Study for this project, it is highly likely that juvenile Chinook salmon will access and use the Edmonds Marsh system and restored nearshore habitats at the outlet.

1. Concerns have been raised if the proposed stream mouth on the park beach will remain open to fish passage given the active shoreline drift conditions. Hydrodynamic modeling results demonstrate that the tidal prism and ebb tide exchange from the marsh through the daylight and beach channel have adequate energy to transport sediments and maintain a channel connection with the sound. Sediment transport and deposition dynamics along the shoreline through winter storms and natural shoreline drift processes are expected to affect the shape and location of the outlet at the beach. It is anticipated that the outlet of the daylighted channel will shift and change position over time and this will need to be factored into planning and design discussions dealing with park uses and protecting park infrastructure. Occasionally, shifting beach sediment deposits and drift logs may temporarily block passage, but this will likely be intermittent. The City is proposing a conceptual park design plan that intends to identify adequate space for natural channel migration on the beach, while integrating the restoration design with park infrastructure constraints.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Species | Life History Present (egg, juvenile, adult) | Current Population Trend (decline, stable, rising) | ESA Coverage (Y/N) | Life History Target (egg, juvenile, adult) |
| Chinook salmon | None | n/a | Y | Juvenile |
| Coho salmon | None | n/a | N | Egg, juvenile, adult |
| Chum salmon | None | n/a | N | Juvenile |
| Cutthroat trout | Egg, juvenile, adult | Unknown | N | Egg, juvenile, adult |

* 1. **Discuss how this project fits within your regional recovery plan and local lead entity’s strategy to restore or protect salmonid habitat in the watershed**

The Willow Creek daylighting project is on the WRIA 8 three-year work plan, M233 Willow Creek daylighting (Edmonds Marsh Restoration). The project is located in the WRIA 8 nearshore subarea, which is a Tier 1 priority in the WRIA 8 Chinook Recovery Plan. The project addresses a priority action outlined in both the WRIA 8 Chinook Recovery Plan and the 2012 Puget Sound Partnership Action Agenda- restoration of barrier (or pocket) estuary habitats. The target fish species for this project is juvenile Chinook, which is a priority fish species across the Puget Sound region. The 28-acre Edmonds Marsh complex is one of the few remaining barrier estuary marsh systems in the Central Puget Sound basin and is particularly noteworthy because of its large size.

* 1. **Explain why it is important to do this project now instead of at a later date**

The extensive loss in both size and quantity of coastal embayments in the Central basin of Puget Sound (includes WRIA 8 nearshore subarea) has been highlighted in historic change analysis studies (Collins and Sheikh, 2005). Due to this historic loss, there are very few remnant estuarine marsh restoration opportunities. Review of the WRIA-8 Salmon Recovery Funding Board Grants, Puget Sound Nearshore – Estuary and Restoration Program, and the Puget Sound Nearshore Ecosystem Restoration Program indicates that the Edmonds Marsh, Willow Creek daylight project may be the largest tidal marsh estuary restoration project opportunity along this 20 mile section of the eastern, Central Puget Sound nearshore area and shoreline.

The timing is appropriate for this project. The City of Edmonds solidified their support and leading role on this project by taking over project sponsorship upon closure of People For Puget Sound in Sept 2012. The project team has spent two years conducting outreach to the community, making it politically feasible at this time. This project has broad support throughout the Edmonds community, including support of many elected officials on City Council and Port Commission. In addition, the marsh was recently reclassified as “tidal marsh habitat” during the City’s Shoreline Master Program update process, giving it a higher level of protection. Further, the City’s Parks Department is interested in the project moving forward at this time so that the feasibility work can be incorporated into planning at the shoreline park.

**If any part or phase of this project has previously been reviewed or funded by the SRFB, please fill in the table below.**

|  |  |  |
| --- | --- | --- |
| **Project # or Name** | **Status** | **Status of prior phase deliverables and relationship to current proposal?** |
| 11-1553 | X Completed  □ In Process   * Not Funded\* | The Early Feasibility Study phase-completed May 2013. Deliverables: alternative alignment screening assessment, conceptual project design, and a determination of biological response to daylighting Willow Creek. The results of the feasibility study indicate a positive biological response of juvenile Chinook to an accessible, daylighted channel connecting Edmonds Marsh more directly to Puget Sound- the driving factor behind moving forward with this project. |

1. **Project Description**
   1. **Provide a detailed description of the proposed project and how it will address the problem described above**.

The full scope of restoring Edmonds Marsh involves:1) construction of a new ‘daylight’ tidal channel connection from Edmonds Marsh to Puget Sound, 2) improvement of fish passage barrier issues and tributary connectivity upstream of the marsh complex, 3) eradicating invasive species, and 4) addressing potential contamination and stormwater as it pertains to the marsh and flooding. The proposed final feasibility study will investigate these elements. In addition, the project will address social interests, such as access and recreation opportunities, economic and social value of a restored ecosystem in terms of climate change and sea-level rise preparedness, carbon sequestration capacity, and economic value of ecosystem services. This restoration project is being developed in coordination with stakeholders and property owners within the vicinity of the marsh, namely Unocal/Chevron, Port of Edmonds, Washington Department of Transportation (including WA State Ferries Division), Sound Transit and BNSF Railway Company.

***Current project phase****:* The project is currently in Final Feasibility phase. Finalizing feasibility of the Willow Creek daylight connection to Puget Sound will building upon the results of the Early Feasibility Study, and complete evaluations of the objectives described above.

An additional concern was raised during SRFB grant technical review that the daylight of the channel on the park beach and shoreline drift zone is complex and may require physical modeling. The project engineering team does not believe this is a cost effective approach for evaluating beach hydrodynamics and morphologic response. Instead, the project team proposes a hydrodynamic modeling and coastal geomorphologic evaluation of the beach daylight channel to address the uncertainties of channel blockage and migration and potential impacts to local infrastructure. A HEC-RAS model was recommended for this project by the project engineering team as a cost-effective and straightforward means of evaluating the projects physical parameters and the associated biological response. The project team includes a hydraulic engineer and coastal engineer, both with significant expertise in tidal hydrology, sediment transport and coastal geomorphology. The project approach will evaluate the beach channel response using information from the HEC-RAS model of the beach channel and assessing beach geomorphology and sediment dynamics. Beach channel hydraulics, sediment transport and coastal geomorphologic response will be evaluated using a range of tidal, tributary and flood flow conditions evaluated in the model, to evaluate the likelihood of channel blockages and impacts to property and infrastructure. We anticipate that the assessment of energy dynamics and sediment transport conditions will maintain channel outlet conditions with only minor blockages and maintenance needs. We will also determine the need for a self-regulating tidegate (or floodgate) to protect adjacent property and infrastructure from coastal flooding. This phase will include a evaluation of real estate, land acquisition and easement needs, landowner outreach and preliminary negotiations, and updating the cost estimates provided in the Early Feasibility Study and initial scoping of all necessary permit applications.

* 1. **Clearly list and describe all products that will be produced (i.e., project deliverables).**

During this phase, we intend to meet the required deliverables set forth in Manual 18 Appendix D-2. Although this project is not in design phase, we feel we can provide a preliminary design report based on the current scope by the end of this project phase. Deliverables will include:

* *Cultural Resources Review-* As required by RCO
* *Topographic surveys-* will be performed along the daylight alignment for the proposed channel and beach outlet area, and along upstream marsh areas to improve marsh channel and surface data for the hydraulic model and to facilitate future channel designs.
* *Beach outlet evaluation-* This task will evaluate the preferred alignment for the beach outlet based on optimal fish passage, hydrodynamics, sediment transport and geomorphologic conditions and risks to property and infrastructure.
* *Hydrodynamic modeling-* Numerical hydrodynamic modeling will be performed to assess the need for a Self-Regulating Tidegate (SRT) (or floodgate) in the project design and, along with the beach sediment and geomorphologic evaluation, assess the likelihood of the channel becoming impassable to juvenile fish.
* *Geotechnical assessment*- Geotechnical studies will include field explorations and environmental sampling along the proposed channel and beach areas as a basis of information for future design and cost estimating.
* *Contaminated Soils assessment*- Review data and reports provided by the Unocal/Chevron along the proposed daylight channel and assess the need for a HDPE liner to reduce contamination risks. Additional soil and groundwater testing and sampling may be required.
* *Property, Real Estate and Lands plans and negotiations*- this deliverable will address negotiations for rights of entry, acquisition and easements required for the project. The project team will provide a summary and professional judgment of discussions with Unocal/Chevron regarding the availability of the property to host part of the channel and with BNSF regarding daylighting the channel under the existing bottomless culverts.

In addition, the City will be undertaking, supporting studies in parallel to this project using separate funding sources. These studies support the overall goals of this project and provide multiple benefits, they are not directly related to Chinook recovery benefits provided by this project and are therefore considered leverage and not direct project matching funds.

* *Marina Beach Park Master Plan:* Once the preferred beach daylight alignment is identified the City will incorporate this alignment into a master planning process for the entire Marina Beach Park area.   This planning process will address infrastructure, public use constraints, competing park uses and the public opinion of the redesign of Marina Beach Park. The City understands that providing room for beach daylight channel migration is necessary component of the restoration plan. The City is anticipating the Master Planning process will address possible changes to the Off Leash Area adjacent to Marina Beach Park.
* *Dayton St. & SR 104 Flood Reduction Study:* The preliminary results of this study indicate the preferred solution to the frequent flooding at this intersection includes 1) separation of the Dayton St. stormwater system (including removal of stormwater discharges from Harbor Square to the Marsh) from the Willow Creek/Shellabarger Creek/Edmonds Marsh system and 2) improving flood conveyance in both systems. Improving the Shellabarger Creek culverts under SR 104 and providing a more defined channel in the Marsh will separate these flows allowing Shellebarger Creek to discharge through the Marsh without mixing with the Dayton St. stormwater. The Willow Creek daylight project is a component the proposed flood reduction solution to provide conveyance and tributary flows to the Marsh from Willow and Shellabarger Creeks, while reducing other urban stormwater flow to the marsh.

**If the project will occur in phases or is part of a larger recovery strategy, describe the goal of the overall strategy, explain individual sequencing steps and which steps are included in this application.**

The table below describes sequencing of the overall project. Steps included in this proposal are final feasibility, initial permit scoping and initial implementation costs.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Task** | **Phase** | **Status** | **Target Date** | **Deliverable(s)** |
| Early Feasibility Study | Feasibility | Complete | 5/2013 | Topo survey, DEM, hydrologic model, alternative screening analysis, conceptual design |
| Final Feasibility Study | Feasibility | Proposed in this application | 8/2015 | Final Feasibiliy Report, Cultural Res Review, Alt. scaled plan view drawings and cost estimates |
| Final Design and Permit Applications | Design | Future | 12/2016 | Design Report and permit applications |
| Permit awards | Design | Future | 2017 | Acquired permits |
| Monitoring/Stewardship Plan | Design | Future | 2017 | Monitoring and stewardship plans |
| Contractor selection/bid award | Implement | Future | 2018 | Bid selection process outline and const. contract |
| Construction | Implement | Future | 2018 | As-builts |
| Monitoring | Evaluate | Future | 2021 | Monitoring report |
| Reporting | Admin | Future | 2021 | All project info submitted into PRISM and HWS |

* 1. **If your proposal includes developing a design:**
     1. **Will the project design be developed by a licensed professional engineer?**

This project does not include a design, however the City of Edmonds will contract a licensed professional engineer for this phase and the City has several professional engineers in the Public Works department who will work on this project.

* + 1. **For final design projects, if you do not intend to apply for permits as part of this project’s scope of work, please explain why and when permit applications will be submitted.**

This phase does not include final design. We are anticipating future permit needs, for which the final feasibility study will provide some of the necessary environmental and engineering documentation for the permits. We also intend to begin initial communications with permitting agencies to raise awareness of the proposed project.

* + 1. **Has Washington Department of Natural Resources confirmed that your project is or is not on state-owned aquatic lands?**

Yes- DNR staff has confirmed this project does not occur on State-owned aquatic lands (pers comm. With Brenda Werden, WDNR on 4/12/2013).

* 1. **If your proposal includes a fish passage or screening design:**
     1. **Has the project received a Priority Index (PI) or Screening Priority Index (SPI) number? If so, provide the PI or SPI number and describe how it was generated:**

WDFW staff have determined that this project does not yet have a PI or SPI#. The scope of this project is downstream of WDFW surveys (pers. comm on 4/18/13 with Ryan Gatchell, Fish and Wildlife Biologist, WDFW).

* + 1. **For fish passage design projects:**
       1. **If a culvert or arch is proposed, will it employ a stream simulation, no slope, hydraulic, or other design?**

This project is not currently in design phase. However, the project does require a set of two culverts/bridges to allow the daylighted stream passage under two tracks of BNSF railroad.

* + - 1. **Describe the amount and quality of habitat made accessible if the barrier is corrected.**

The Early Feasibility Study (available on PRISM) indicates that improving the connectivity of Edmonds Marsh to Puget Sound “offers a great deal of potential for fish movement” into the marsh, and will improve fish passage attractants, connectivity and accessibility to the remnant 28 acres of barrier marsh habitat. Habitat estimates from the study include 3.2 acres of mudflats, 5.9 acres of low salt marsh vegetation, 11.4 acres of freshwater marsh, and 6.1 acres of forested wetland. The proposed project anticipates that a portion of the freshwater (cattail) marsh will convert to tidal marsh habitat resulting from the increased salt water tidal prism to the marsh. The proposed project will also add 1 acre of daylighted and beach channel habitat replacing the existing 1,600 foot pipeline.

* + - 1. **Identify if there are additional fish passage barriers downstream or upstream of this project.**

There are no additional barriers downstream of the proposed daylighted channel. There are fish passage barriers upstream, on both creeks. The scope of Willow Creek basin restoration intends to address upstream barriers on Willow Creek in the future. Upstream Willow Creek currently supports a cutthroat trout population and is less urbanized.

* 1. **Describe other approaches and design alternatives that were considered to achieve the project’s objectives and why the proposed alternative was selected.**

An alternative daylight channel screening analysis was performed during the Early Feasibility study phase. The screening analysis considered three daylight alternative alignments for connecting the marsh to Puget Sound. As described in the Early Feasibility study, the proposed daylight alternative was selected as the beach has nearshore habitat attractants such as sediment shoaling, macro-algae beds, and potential forage fish areas. The preferred alignment also has the least infrastructure impacts, the lowest cost associated with these impacts, and is the only full daylight alternative.

* 1. **Describe your experience managing this type of project.**

City of Edmonds staff has experience managing local, state, and federal grant funded projects that are complex and multi dimensional. In addition, City of Edmonds has contracted EarthCorps for project management services for this project. The project engineering team will also have expertise in management of feasibility, design and construction of SRFB funded habitat restoration projects.

* 1. **Explain how the project’s cost estimates were determined.**

Project cost estimates were determined by developing a thorough scope of services and cost estimate, and comparing the cost estimate to other projects with similar scope in the Puget Sound. Concern has been raised as to how the total project costs, including implementation, will be paid for. The project team recognizes the multiple benefits, therefore, multiple funding sources for this project are being sought. We anticipate a multi-year fundraising effort that will draw on several sources available to our City, including salmon recovery funds, stormwater management funds, private foundations, and major donors. We are working with EarthCorps, an organization that has extensive fundraising experience with federal, State, local and private donors.

* 1. **List Project Partners and their role and contribution to the project.**

As of now, there are no additional project partners who are contributing financially to this project, beyond the City of Edmonds. The Port of Edmonds has been identified as a potential partner in association to their redevelopment plans for the property adjacent to the marsh. Sound Transit has expressed support for the project (Letter of Support provided). In addition, the project is strongly supported by the local, grassroots group Friends of Edmonds Marsh (FOEM), who have been conducting public education and outreach.

**I. List all landowner names*.***

*City of Edmonds*- project sponsor and landowner.

*Unocal/Chevron*- landowner of adjacent property that a portion of the project will occur

*Burlington Northern Santa Fe Railroad-* owns right-of-way and existing culverts where daylighted channel would cross under the railroads tracks to the creek outlet.

*Port of Edmonds-* adjacent landowner to the west and north of the project area.

* 1. **Contingency Planning: State any constraints, uncertainties, possible problems, delays, or additional expenses that may hinder completion of the project. Explain how you will address these issues as they arise and their likely impact on the project.**

Potential constraints and uncertainties for the Marina Beach Park include: 1) beach daylight channel sedimentation and fish passage and 2) channel migration and impacts to property and infrastructure. Contingencies would include additional structures and maintenance to prevent or limit the impact of these conditions.

Identified potential constraints and uncertainties for the adjacent Unocal/Chevron site including: 1) Future ownership and land use; 2) Remaining contaminant levels and; 3) Potentially placing a portion of the daylight channel and expand marsh restoration onto the property. Contingencies would include additional coordination and negotiation with Unocal/Chevron for completing cleanup of the property per their current legal obligations.Delays in the project could occur for real estate, property acquisition, master planning, and in the permitting phase of work. Both of these phases are expected to be cumbersome for a project of this size and type and in the phasing of construction to align with funding sources and availability. We intend to begin outlining expenses, in general, during this phase as we complete feasibility.

**List and describe the major tasks and schedule you will use to complete the project. (Planning projects should typically be completed within two years of funding approval).**

|  |  |
| --- | --- |
| Task: | Est completion date: |
| Finalize feasibility study contractor bid process and award | 2/2014 |
| Cultural Resources Review | 4/2014 |
| Topographic surveys | 6/2014 |
| Beach outlet alignment | 7/2014 |
| Hydrodynamic modeling | 9/2014 |
| Geotechnical Assessment | 11/2014 |
| Contaminated Soils Assessment | 11/2014 |
| Final Feasibility Report | 3/2015 |