Project ID: 30006

Effectiveness monitoring of the Chinook River estuary restoration project.

Responses to ISRP Questions

1. Is there a firm commitment and funding in place for tidegate removal?

There is strong commitment among project partners to complete the restoration project. To date, nearly $4.2 dollars have been raised from a variety of funding sources to complete acquisition and restoration objectives - a summary of project partners and their contributions is shown below. We believe that funding is sufficient to complete tasks related to tidegate removal. However, the results of the engineering study may conclude that additional funding is needed to modify the opening at the river's mouth in order to maximize ecological benefits for fish and wildlife.

The project not only address the issue of access for both juvenile and adult salmonids but it aims to restore habitat forming and maintaining process (tidal energy)

As stated above, the project is currently in the engineering and design phase. Foster Wheeler Environmental Corporation is completing tasks related to hydrologic and hydrodynamic model required to complete project design tasks. Essentially, the goal is to maximize ecological benefit for salmon within existing funding constraints and minimizing flooding risk for adjacent landowners. Several planning meetings have been held as modeling results have become available. We anticipate that a design will be complete early this summer at which point the permitting process will begin. The earliest any construction could begin would be during the summer of 2004.

Chinook River Estuary Restoration Partnership	
Natural Resources Conservation Service	• Purchased a conservation easement on 872 acres and secured restoration funds through the Wetland Reserve Program. ($2,000,000)
Sea Resources	• Secured grants from the Salmon Restoration Funding Board and the Bonneville Environmental Foundation for restoration work, monitoring, and public outreach. ($807,000 total)
Washington Department of Fish and Wildlife	• Secured a National Coastal Wetland Grant for restoration and additional acquisition (up to 230 acres). ($960,000)
Ducks Unlimited	• Secured North American Wetland Act Grant ($200,000) • Received a US Forest Service Grant ($20,000) • Provide project engineering
Columbia Land Trust	• Acquisition of 872 acres (donated to Washington Department of Fish and Wildlife). ($210,000)
Lower Columbia Fish Recovery Board	• Salmon Recovery Funding Board lead entity for the project.
US Fish and Wildlife Service	• Technical assistance, monitoring equipment grants, and other project support.

2. What is the status of negotiations/discussions for breaching the causeway?

Complete removal of the causeway structure is the preferred alternative but existing funding levels are not sufficient to construct a bridge across that span or to construct the extensive tidegate and levy system required to protect adjacent landowners. The current modeling effort suggests that the causeway will continue to protect adjacent lands even if the tidegate is removed, but current velocities will exceed WDFW fish passage criteria. The current design strategy is to complete a sensitivity analysis that will plot velocities as a function of channel width. The final design is likely to allow for manipulation of the channel width during severe storm conditions but allow maximal tidal exchange during the majority of the time.

3. The work is needed but the proposal lacks adequate description of the research design and methods for accomplishing the work.

a. Why was Baker Bay chosen as a reference site?

The reference site in Baker Bay was selected because it is one of the most well developed tidal channels adjacent to the project area. Access is unobstructed and we assume that juvenile salmon with life history patterns using this habitat would be the same fish that would be using the lower Chinook River.

This is obviously not a perfect control site for a variety of reasons but we believe it is the best opportunity of giving us a general indication of juvenile salmon utilization of unobstructed tidal habitats in Baker Bay.

b. What are the locations of the fish sampling sites?

The attached map shows the locations of fish sampling sites. These sites were derived from exploratory sampling conducted during 2001.

c. How will fish be sampled?

Fish will be sampled using a combination of techniques including rotary screw migrant traps, a fyke net, pole seines, and hook and line. These techniques have been tested and refined during 2001 and are specific to sites shown on the attached map. Trap efficiencies will be calculated at both smolt traps to complete population estimates and other marking techniques such as PIT tagging and dye marks will but applied to fish to determine length of residency in the estuary.

d. Will tidal channels be trap netted?

The reference site will be the only site where a trap net will be used. This system will allow almost a complete blockage to emigrating fish during an outgoing tide. Fish will be collected in a live box and processed. Sampling of the reference site will occur bi-monthly.

e. Will all major habitat types within the estuary be sampled?

Our investigative sampling suggests that fish use only few areas in the lower Chinook River – the primary being near the confluence of the old and new channels. Estuarine habitats are severely degraded and water quality conditions become very poor during mid-summer due to lack of tidal flushing.

f. Will the same sampling methods be used in Baker Bay as in the Chinook estuary?

No, the smolt trap that operates at the mouth of the Chinook River is analogous to the double-winged fyke-net we propose to use at the reference site in that they will both monitor emigration. These methods are the best options for each site.

4. More detail is needed concerning the scale analysis.

a. How will the origin of fish be determined from scales?

We are aware of only two techniques to determine origin of juvenile salmon captured in our monitoring – genetic analysis or PIT tagging (assuming tagged fish are recaptured as adults returning to their spawning grounds or we capture fish tagged in their stream of origin). We will be unable to achieve this objective simply by reading scales.

b. How will freshwater and estuarine growth be distinguished?

Some researchers have suggested they can differentiate between estuarine and freshwater growth from scale patterns. We have continued to research this issue and are still not confident that this is the best technique to determine rearing patterns. Also, as a result of our research, we believe that otolith analysis may prove to be a preferred method to meet this objective.

c. How will growth rate be determined from scales?

We are now less confident that this can be accomplished than when the proposal was developed. Growth rates can easily be determined by recapturing PIT tagged fish.

5. Many water quality sampling stations are shown on the map in Figure 2. How will water quality be sampled at these locations? How often?

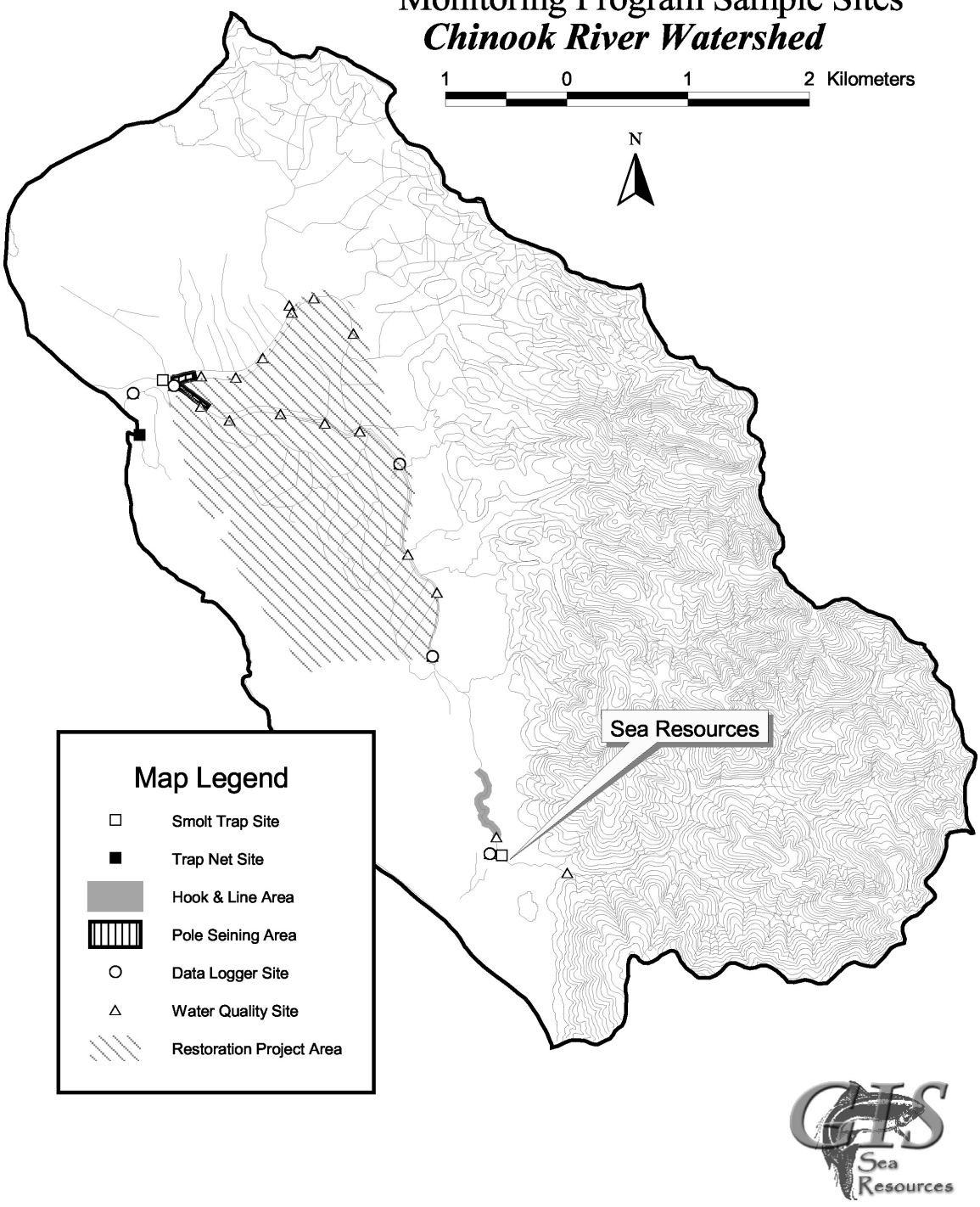
During 2001 we manually measured water quality parameters (DO, Temp, pH, Salinity, Conductivity) at the 21 sites shown on the attached map. The objective was to characterize the gradient of conditions from the mouth to approximately River Kilometer 7 through the course of a year. These sites were monitored weekly from May through October and then bi-weekly during the remainder of the year. This effort provided valuable information regarding seasonal variation in these parameters during the year but it did not characterize variation through the course of a tidal cycle. We then used information derived from this effort to strategically locate positions for five continuous data loggers that would simultaneously monitor conditions though the course of tidal cycles and through the course of the entire year. We will likely continue to monitor the other sites twice monthly during spring and neap tide stages as a quality control measure.

6. How will structural changes in the estuary as a result of restoration efforts (e.g., redevelopment of tidal channels, vegetation changes) be quantified and related to fish distribution and abundance?

The hydrodynamic modeling effort required the development of a high-resolution digital terrain model of the project area – this will act as the baseline condition with respect to monitoring changes in channel morphology. Vegetation changes will be monitored using data collected during the hyperspectral mapping project sponsored by LCREP. As a minimum, sample sites will be revisited and measured annually – optimally, new flights will be planned to detect changes in vegetation communities and habitat over time. Our efforts to monitor life history diversity and the specific survival benefits of each life history type will allow us to begin detecting changes in habitat use as habitats change due to the restoration actions. This is a watershed wide effort that is just beginning but we are already beginning to observe rearing patterns among all five salmonid species that exist in the basin.

7. The sponsors plan to develop a computer database. Will an existing database structure and monitoring protocol be used so data is applicable across the basin?

We will coordinate the design and development of our database with our science advisory committee, and others working to develop regional databases such as Oregon Graduate Institute. Monitoring protocols have been adopted from a variety of agencies and organizations working in the region, these include WDFW, ODFW, and OWEB.


Monitoring Program Sample Sites
Chinook River Watershed
1 0 1 2 Kilometers
N
Sea Resources
Map Legend
Smolt Trap Site
Trap Net Site
Hook & Line Area
Pole Seining Area
Data Logger Site
Water Quality Site
Restoration Project Area
GIS
Sea Resources