

Appendix M

COST ESTIMATE BACKGROUND

Cost estimates are rough and order of magnitude estimates and should be used cautiously. The following notes explain how costs for the plan were developed and what is and is not included. It is important to remember that funding could be from a variety of federal, state, and local sources, as well as through mitigation. Some of the actions are being implemented or nearing implementation (e.g., the City of Everett's Union Slough project).

1. Restoration Cost Estimates

Estimating accurate project costs is challenging because project proposals often include several restoration elements, and the specifics of individual projects are often unknown. The estimates in this table provide a relative cost comparison among alternatives and an order of magnitude estimate of restoration costs. They were generated based on average costs for various project types in the proposed project menu. The costs for individual projects in the proposed project menu were calculated using Shared Strategy's restoration cost primer.

- **Nearshore.** The nearshore restoration costs were estimated using best professional judgment. The total shown in Section 12.0 is the same as that in Appendix J - Project Ideas and Opportunities.
- **Estuary restoration.** The bulk of estuary restoration costs are comprised of cross-dike construction to protect adjacent critical infrastructure and allow breaching of existing dikes along the channel. Cross-dike construction, including permitting costs and some grading, averages about \$1,000/linear feet. The total costs presented in the table are derived from a selection of projects from the estuary proposed project menu. Projects were selected based on their likelihood of completion in 10 years using best professional judgment. Sites used to generate the cost estimate include Everett's Union Slough, Spencer Island, Port Union Slough expansion, Qwuloot, Smith Island-Rhodes, Diking District 6, Beringer, and the north tip of Ebey Island.
- **Riparian restoration.** Riparian restoration costs can vary from site to site based on accessibility, invasive species, maintenance needs, availability of volunteers and other factors. The cost estimate here assumes that half of the acreage planted will be easier and half will be more difficult. The lower cost estimate is \$13,000/acre (ac) and the higher cost estimate is \$21,000/ac. It is assumed that plantings will occur within 200 feet (ft) of the channel or approximately one site potential tree height.
- **Bank restoration.** Bank restoration projects vary substantially in difficulty and costs. At the low end, bank restoration consists of incorporating large woody debris into an existing bank or adding fencing. At the high end, bank armor is removed, large woody debris and other roughness elements are added, and the site is regraded. The cost estimates provided in the table assume that one-third of bank restoration will be relatively simple (\$130/linear ft), one-third will be of moderate difficulty (\$275/linear ft), and one-third will involve major excavation and grading (\$580/linear ft).
- **Off-channel reconnection.** Costs associated with reconnecting side-channels, sloughs, and oxbows are the most difficult to predict. Excavation and construction of setback dikes to protect

adjacent properties are the main component of project costs. Simple reconnection projects generally cost about \$20,000/ac of habitat gained. Difficult projects involving substantial excavation can cost as much as \$140,000/ac or more. These projects often include bank restoration, riparian planting and engineered logjams. Because of the likelihood of double-counting bank, riparian, and large woody debris costs, the cost estimates for the table were generated using an average cost/ac of \$60,000.

- **Large woody debris/jam restoration.** Large woody debris restoration in large river mainstems will generally involve the construction of jams in side-channels, at the mouth of reconnected off-channel features and incorporated into banks of the main channel. These features, including materials and construction costs, average approximately \$50,000 per structure.
- **Culverts.** Culvert replacement is estimated at an average unit cost of \$60,000.

2. Acquisition Cost Estimates

Over the next 10 years, there will likely be willing sellers, and their land will be purchased for conservation purposes.

- **Estuary.** Fee simple acquisition is likely to continue in the estuary. For the projects identified in Section 10.5, additional acquisition was estimated for the Qwuloolt project (20 acres), Smith Island Rhodes and related (125 acres), and North tip of Ebey Island (200 acres) at \$5,000 per acre. Fifty acres along the mainstem and in the emergent marsh area were estimated to be needed. This industrial land would have a much higher cost and was estimated at \$30,000 per acre.
- **Mainstems.** Acquisition in the mainstems could be fee simple or a less costly purchase of development rights or conservation easements. The cost estimate is just a general order-of-magnitude number for the next 10 years. While the plan does not target properties for acquisition, approximately 1,000 acres in the Snoqualmie Watershed could be purchased at \$7,500 per acre and approximately 1,000 acres combined in the Skykomish and Snohomish watersheds could be purchased for \$5,000 per acre.

3. Non-capital Cost Estimates

Non-capital costs are estimated based on the number of people who would be needed to implement the recommendation. A person is estimated to cost \$80,000/year. This could be higher or lower depending on the agency or organization and actual salary. Decreased costs were calculated by reducing the number of people. Some costs could be higher initially or have peak times.

- **Coordination.** This includes maintaining the watershed alliance, coordinating the yearly grant solicitation and prioritization, developing capital project concepts, grant writing, and regional coordination. It includes staffing for both Snohomish and King Counties for a total of six staff.
- **Updating regulations.** This includes updating policies and regulations. It is assumed that this would happen concurrently with updates to the Growth Management Act and for other purposes. It assumes some staff hours from Snohomish and King Counties, as well as other jurisdictions, a total of one full-time equivalent (FTE). It also assumes that this would occur in the first five years only.

- **Enforcement.** This includes tracking permits and enforcement. It includes staff for Snohomish and King Counties, as well as other jurisdictions. This assumes 4 enforcement staff throughout the basin.
- **Technical Assistance.** This includes the following FTEs for each county: 1 person for agriculture, 1 for rural residential and forestry, 2 stewards, and 0.25 for nearshore assistance, for a total estimate of 8.5 FTE.
- **Education and outreach.** The estimate for this function is 1.5 staff distributed between both counties.
- **Incentive programs.** This assumes 2 people in the basin developing, promoting, and managing incentive programs. Actual incentive costs are not included.
- **Monitoring.** This includes implementation monitoring (yearly), effectiveness monitoring (sample projects), and physical habitat monitoring. This assumes 2 people for each county (including a dedicated field person), Tulalip staff, and staff for other jurisdictions, for a total of 5.5 FTEs.
- **Data gaps.** The estimate to address data gaps assumes an annual fixed cost over 10 years of \$40,000.
- **Operating expenses.** This is the cost for agencies to change road maintenance practices and management of public facilities. It assumes 1.5 FTEs in the first three years only.

4. What is not included in the cost estimates

- **Cost to agencies and jurisdictions to participate on the Forum at their existing level.** The Policy Development Committee concluded that Forum staff and coordination should be included. However, the cost of participating staff (i.e., a planner from a local city who attends Forum meetings, some committee meetings, and keeps his/her agency informed of issues) would be carried by that agency as an existing cost.
- **Increased costs to public capital projects due to regulations.** These are assumed to be assigned to the cost of the infrastructure (roads, sewers) rather than salmon conservation.
- **Incentives.** These are not estimated because the programs need to be designed or better clarified. High levels of incentives could be used for any level of effort.
- **Federal and state staff.** Costs of scientific work and coordination with federal and state agencies are not included. Costs for the Washington Department of Fish and Wildlife watershed steward are not included.
- **Hatchery and harvest costs.** These would likely be the same under any level of effort. These figures would need to be supplied by the co-managers.

- **Nearshore.** These were not estimated because specific acquisition needs are not identified in the plan. There could be acquisition along beaches, for the Priest Point project, and in the Maulsby mudflat. Costs are likely to be expensive and vary depending on the area to be acquired.
- **Cost of lowlands protection and restoration.** Costs are unknown at this time.
- **Headwaters acquisition.** Costs are unknown at this time.