

Results

continued

Reducing Uncertainty

There is a certain degree of uncertainty in the physical, biological, and available economic and social data. Estuaries are complex natural systems, and our science is imperfect. Uncertainty about the physical effects of estuary restoration resulted from: 1) limited field data from physical and biological studies, and 2) limitation of models used to predict conditions in a restored estuary.

Uncertainty about social and economic value or impact estimates resulted from: (1) a lack of socio-economic data related to the Deschutes basin, and (2) the applicability of studies from other regions to the Deschutes basin.

There are several additional basin assessments that would further reduce uncertainty, and could be helpful to decision makers.



Reference Estuary Study - September 2005. Courtesy of Earth Design Consultants, Inc.

- **Optimal Lake Management Plan.**
A baseline lake management plan would describe the desired shoreline and lake conditions (e.g., desired lake depth) for continued lake management.
- **Capitol Lake Fish and Wildlife Habitat Assessment.**
Such an assessment would improve understanding of the extent and quality of the existing habitat in Capitol Lake.
- **Sediment Management Cost Estimates.**
Cost estimates for lake dredging could be compared to dredging costs for estuary restoration. While dredging cost estimates exist for the Port of Olympia and the Percival Landing marinas, there is not a comparable figure for the cost to maintain a lake.



Aquatic sediment sampling. Courtesy of GeoEngineers, Inc.

CAPITOL LAKE

Adaptive Management Plan

Net Social and Economic Benefit Analysis



Study Background

This Fact Sheet is a summary of major findings from the Deschutes Estuary Feasibility Study. It presents information from the fourth in a series of technical reports. The "Deschutes Estuary Feasibility Study, Net Social and Economic Benefit Analysis" was prepared by Cascade Economics (Washougal, WA), in association with Northern Economics (Bellingham, WA). The full report can be downloaded from the Washington Department of General Administration website: www.ga.wa.gov/CLAMP/EstuaryStudy.htm

The Deschutes Estuary Feasibility Study's Net Social and Economic Benefit Analysis (NBA) describes the social and economic effects of restoring the Deschutes River estuary. This analysis will help evaluate the feasibility of restoring Capitol Lake in Olympia and Tumwater, Washington, to an estuary of the Deschutes River.

To conduct the analysis, economists:

- Established the geographic scale of the study;
- Identified the existing conditions;
- Assembled information about the physical or biological changes that estuary restoration would cause; and



Focus group meeting - March 2006. Courtesy of Washington State Department of Fish & Wildlife.

- Determined the social and economic effects of the physical or biological changes.

Economists studied data from existing technical reports regarding the physical features of estuary restoration and existing socio-economic data and studies. The NBA identifies whether uncertainty in the results comes from limitations of existing data or from the economists' methods of analysis.

Community Values

In preparation for the NBA, the CLAMP Steering Committee sponsored a series of focus groups and an open public forum to gather input from area stakeholders regarding the social and economic values they associate with the Deschutes River Basin. Community members generated more than fifty different values, which were addressed in the NBA report.

Community values were sorted into categories so that economists could apply the appropriate social and economic analysis methods. The results were quantitative (numerical) where the data allowed, and qualitative (descriptive) where the data was limited. While the social and economic methods used in this analysis are common, the practice of allowing the community to define the scope of study is innovative.

Funding for this study was provided by:



For additional questions, please contact:
Nathaniel Jones, Facilities Division
Phone: 360-902-0944 • E-mail: njones@ga.wa.gov



Results

The complete results of the NBA are summarized in Table 1 by category of analysis. Several of the categories of analysis yielded more complete and/or more certain results. A more complete discussion of these categories is included here.

Habitat

The physical changes within a restored estuary may improve fish and wildlife habitat, increase fish and wildlife populations, and increase fish and wildlife related recreational opportunities. A review of the existing literature suggests that estuary restoration programs and dam removal projects generally lead to positive change in economic value. However, the exact nature and size of these effects are uncertain due to a lack of information about existing habitat conditions and the complexity of estuarine systems in general.

Water Quality

A 2000 study by Brown and Caldwell Engineering found that dissolved oxygen (DO) concentrations in a restored estuary would be substantially higher than the current (lake) conditions. Brown and Caldwell estimated a water quality improvement of 1 to 5 milligrams per liter of DO. Current DO levels in South Puget Sound, and Budd Inlet in particular, are very low. While the value of this water quality improvement is likely positive, the exact magnitude of the value is uncertain.



Aerial photo of Capitol Lake North Basin, looking northeast. Courtesy of Washington State Department of Transportation.

Value	Effect
Biodiversity and Habitat. An estuary would likely improve habitat and add to the variety of plants and animals in the basin.	+
Flood Protection and Sea Level Rise. Some suggest an estuary would be less vulnerable to flooding and sea level rise, but more study is needed.	U
Water Quality. Dissolved oxygen levels are anticipated to improve if an estuary is restored.	+
Recreation. Lake boat launches and boat moorage in Olympia Harbor would be negatively impacted by estuary restoration.	-
Ecotourism. Estuaries tend to improve ecotourism through bird watching, etc., but how many new ecotourists is unknown.	+
Aesthetics, Heritage, and Spiritual. Strongly held views vary greatly based on personal preference.	+/-
Education. Estuary restoration would provide new educational opportunities.	+
Tourism and Downtown Olympia. Effects on downtown businesses are unclear.	U
Port of Olympia. Build up of sediment could have negative impact on maritime business.	-

Table 1. Summary of effects on local values, where "+" is positive, "-" is negative, and "U" is uncertain.

Results

continued

Recreation

Access to most parks, trails, and other land-based infrastructure will not be affected by an estuary restoration, so there would be no loss of land-based recreation as a consequence of restoring the estuary. Some lake-based boat launches could be stranded at low tide, which would negatively impact boat-based recreation unless these boat launches are improved or relocated. In addition, the marinas and overnight boat moorage along Percival Landing would be affected by the accumulation of Deschutes River sediment. Without a cost-sharing arrangement, the Olympia harbor would be negatively impacted by estuary restoration.

The Deschutes River Chinook Hatchery Program contributes substantially to recreational fisheries in Puget Sound, and contributes partially to commercial and tribal fisheries. It is not possible to quantify the effect of estuary restoration on the survival of hatchery Chinook and other salmonid species in the Deschutes River. However, the Pacific Northwest literature suggests that the value of each additional catchable fish ranges from \$7.82 (1993) to \$230.00 (1985)

Economic Impacts

Tourism spending for the Olympia area was estimated at \$209.7 million in 2003. Most visitors arrive when the state legislature is in session, between January and April or May. Tourists also come to the area to view wildlife and engage in civic activities such as Lakefair. It is doubtful that estuary restoration would affect tourism related to the state legislature. It is uncertain, however, whether a restored estuary would attract more or fewer tourists to the Olympia area. Because of this uncertainty, it is unclear whether Olympia area businesses would experience positive or negative economic impacts.

The Olympia harbor, which includes the Port of Olympia, would be negatively impacted by costs associated with increased sediment deposits. The exact amount of these increased costs is uncertain because the frequency of dredging cannot be precisely estimated.



Middle Basin on Capitol Lake. Courtesy of Zac Hart, NOAA.

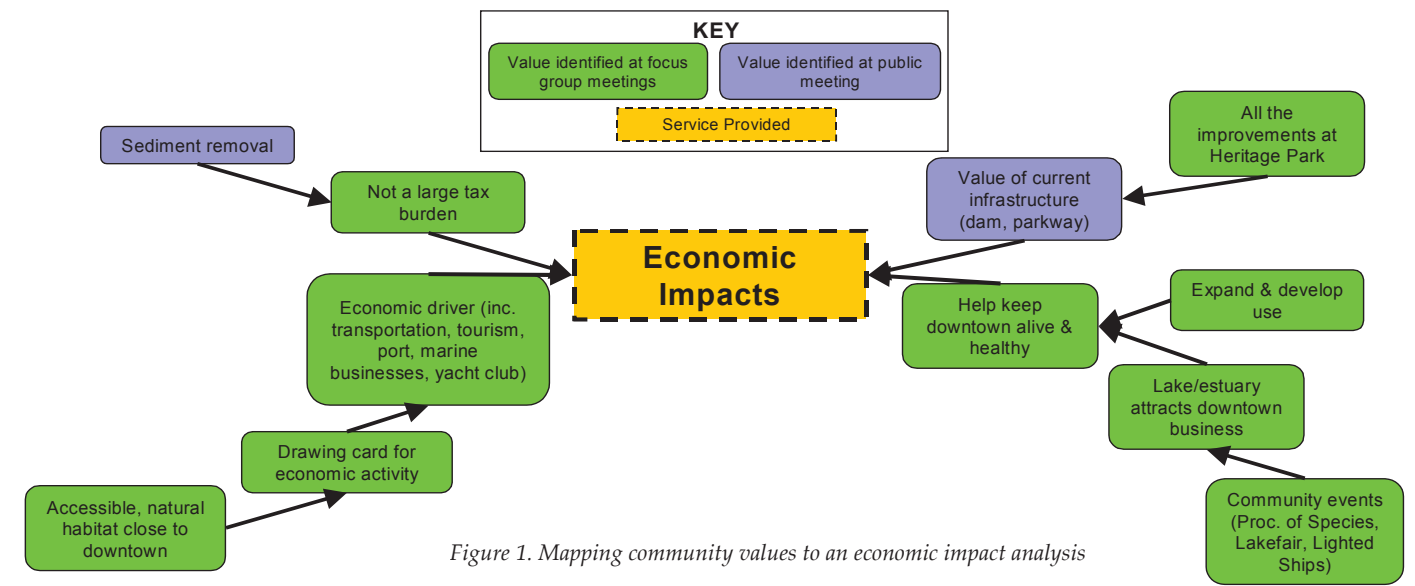


Figure 1. Mapping community values to an economic impact analysis