



# CAPITOL LAKE — DESCHUTES ESTUARY

Long-Term Management Project Environmental Impact Statement

## **Economic Analysis Methodology for Capitol Lake — Deschutes Estuary**

**Prepared for:**

**Washington State Department of Enterprise Services**

1500 Jefferson Street SE  
Olympia, WA 98501

**Prepared by:**

**ECONorthwest**

**August 2, 2019**

This document presents the proposed methodology to assess discipline-specific impacts of the alternatives being considered for the Capitol Lake – Deschutes Estuary Long-Term Management Project. This document has been reviewed by an independent third-party expert or experts and the methodology has been presented to, and discussed with, the resource agencies and local governments on the Technical Work Group. The methodology described has been prepared early in the Environmental Impact Statement (EIS) process, as alternatives are being optimized, and may reasonably evolve as conceptual design, modeling, and analysis of the alternatives progresses. The results of this discipline-specific analysis will be presented in a Discipline Report, which will be attached to and summarized in the Draft EIS. Public comment will be solicited on the Draft EIS, consistent with rules of the State Environmental Policy Act.



# Table of Contents

<b>1.0</b>	<b>Introduction</b>	<b>1-1</b>
1.1	DISCIPLINE-SPECIFIC METHODOLOGY	1-3
<b>2.0</b>	<b>Methodological Context</b>	<b>2-1</b>
<b>3.0</b>	<b>Economic Analysis Methodology</b>	<b>3-1</b>
3.1	IMPACTS TO ECONOMIC ACTIVITY DOWNSTREAM OF THE PROJECT AREA	3-1
3.2	IMPACTS TO DOWNTOWN DEVELOPMENT	3-4
3.3	IMPACTS TO RECREATION	3-7
3.4	IMPACTS TO ECOSYSTEM SERVICES	3-9

## *Figures*

Figure 1.1	Area Map	1-2
Figure 3.1	Downtown Olympia Community Renewal Area Boundary	3-5
Figure 3.2	Thurston County Recreation Areas	3-8

## *List of Acronyms and Abbreviations*

### **Acronyms/ Abbreviations**

### **Definition**

Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EJ	Environmental Justice
Enterprise Services	Washington State Department of Enterprise Services
NEPA	National Environmental Policy Act
SEPA	State Environmental Policy Act
WAC	Washington Administrative Code



# 1.0 Introduction

The Capitol Lake – Deschutes Estuary includes the 260-acre Capitol Lake Basin, located on the Washington State Capitol Campus, in Olympia, Washington. The waterbody has long been a valued community amenity. Capitol Lake was formed in 1951 following construction of a dam and provided an important recreational resource. Historically, the Deschutes Estuary was used by local tribes for subsistence and ceremonial purposes. Today, the expansive waterbody is closed to active public use. It is plagued by environmental issues including the presence of invasive species, violations of water quality standards, and inadequate sediment management.

The Washington State Department of Enterprise Services (Enterprise Services) is responsible for the stewardship, preservation, operation, and maintenance of the Capitol Lake Basin. The 260-acre Capitol Lake Basin is maintained by Enterprise Services under long-term lease agreement from the Washington Department of Natural Resources.

In 2016, as part of Phase 1 of long-term planning, a diverse group of stakeholders, in collaboration with the state, identified shared goals for long-term management and agreed an Environmental Impact Study (EIS) was needed to evaluate a range of alternatives and identify a preferred alternative. In 2018, the state began the EIS process. The EIS will evaluate four alternatives, including:

- **Managed Lake Alternative:** Similar to existing conditions with additional strategies to manage sediment accumulation and water quality. The Managed Lake Alternative would retain the 5<sup>th</sup> Avenue Dam and tide gate in its current configuration to maintain the reflecting pool and Capitol Lake Basin.
- **Estuary Alternative:** Full tidal hydrology would be restored throughout the basin. Sediment would be managed through initial dredging in Capitol Lake Basin and recurring maintenance dredging in Budd Inlet.
- **Hybrid Alternative:** Allows management of the Basin by establishing a tidal estuary in the western portion of the North Basin, and throughout the Middle and South Basins. A retaining wall would also be constructed resulting in a reflecting pool adjacent to Heritage Park in the North Basin.

- **No Action Alternative:** The No Action Alternative is intended to represent the most likely future for the project area if the project is not implemented.

These long-term management alternatives will be evaluated against the shared project goals of: improving water quality; managing sediment accumulation and future deposition; improving ecological functions; and enhancing community use of the resource. Refer to Figure 1.1 for the project area for long-term management. The Final EIS will identify a preferred environmentally and economically sustainable long-term management alternative for the Capitol Lake – Deschutes Estuary.



The EIS process leverages momentum from the previous phase by continuing engagement with the existing Work Groups, which include the local governments, resource agencies, and tribe. It also provides for expanded engagement opportunities for the public, such as a community sounding board. **Additional information, including additional background context, description of project alternatives, and project goals, can be found at the project website: [www.capitollakedeschutesestuaryeis.org](http://www.capitollakedeschutesestuaryeis.org).**

## 1.1 DISCIPLINE-SPECIFIC METHODOLOGY

This document has been prepared to describe the proposed approach to the economic analysis. It has been prepared by ECONorthwest, the Economics lead for the Capitol Lake – Deschutes Estuary Long-Term Management Project EIS. The methodology proposed within this document has been developed following an initial review of existing background documents, available data, comments received during the scoping period, and coordination with the EIS Project Team. The purpose of this document is to solicit feedback on the economic analysis to provide background for and increase understanding of the technical analyses before they begin and to improve the methodology through various levels of early review.

The sections below provide a summary of the process that will be used to investigate, evaluate, and describe the potential economic effects that could occur during construction and operation of the long-term management alternatives described above. The economic analysis of these alternatives will (1) characterize existing conditions within the study area, (2) identify potential economic effects of the alternatives, and (3) recommend mitigation measures, if any, that could be implemented to avoid or minimize the potential adverse impacts.



## 2.0 Methodological Context

The State Environmental Policy Act (SEPA) does not require economic analysis of a proposed action.<sup>1</sup> As such, the statutes and regulations governing SEPA do not provide specific guidance for what an economic analysis should include or what approach it should take to analyzing economic effects. In funding the EIS effort, however, the Washington legislature and project stakeholders indicated that an economic analysis would be a critical component of the documentation of effects, and should be conducted to support the decision-making process.<sup>2</sup> In the absence of specific guidance, the methodology outlined in this document reflects professional standards of economic analysis, in the context of environmental impact review as outlined in the footnotes below. It is consistent with federal guidance for using economic analysis in regulatory decision making,<sup>3</sup> water resource planning,<sup>4</sup> and the

---

<sup>1</sup> See general discussion of precedent related to economic analysis in Department of Ecology, SEPA Unit. 1998. *State Environmental Policy Act Handbook*. Publication #98-114 September. Updated 2003. Retrieved May 26, 2019, from <https://fortress.wa.gov/ecy/publications/documents/g8114.pdf>

<sup>2</sup> Washington Legislature Capitol Lake EIS Funding Proviso: “*The appropriation in this section is subject to the following conditions and limitations: The department shall develop an environmental impact statement to consider alternatives for Capitol Lake. The alternatives considered must include, at a minimum, a lake option, an estuary option, and a hybrid option. The environmental impact statement will also consider sediment transport and locations within lower Budd Inlet. The department must work with affected stakeholders to develop mitigation plans. **The environmental impact statement must also consider an expanded area around Capitol Lake and Budd Inlet including the Port of Olympia for the economic analysis.** The environmental impact statement must consider the use of equal funding from nonstate entities including, but not limited to, local governments, special purpose districts, tribes, and not-for-profit organizations.*”

<sup>3</sup> U.S. Environmental Protection Agency. 2010. *Guidelines for Preparing Economic Analyses*. December 17. Updated May 2014. Retrieved May 27, 2019, from <https://www.epa.gov/sites/production/files/2017-08/documents/ee-0568-50.pdf>

<sup>4</sup> Council on Environmental Quality. 2013. *Principles and Requirements for Federal Investments in Water Resources*. March. Retrieved May 27, 2019, from [https://obamawhitehouse.archives.gov/sites/default/files/final\\_principles\\_and\\_requirements\\_march\\_2013.pdf](https://obamawhitehouse.archives.gov/sites/default/files/final_principles_and_requirements_march_2013.pdf)

National Environmental Policy Act (NEPA) socioeconomic analysis.<sup>5</sup> This methodology is tailored to address the specific topics of concern raised by the public and stakeholders during Phase 1 of the Capitol Lake/Lower Deschutes Watershed Long-Term Management Planning effort<sup>6</sup> and during EIS scoping.<sup>7</sup> We have grouped these concerns into four categories which serve to delineate our analysis:

1. Potential impacts to economic activity downstream of the project (i.e., north of the 5<sup>th</sup> Avenue Dam);
2. Potential impacts to development in downtown Olympia;
3. Potential impacts to recreation activity directly and indirectly related to Capitol Lake; and
4. Potential impacts to ecosystem services within, adjacent to, and downstream of the project area.

Guidance for NEPA and precedent under SEPA both stipulate that in conducting economic impact review, a benefit-cost analysis is not required, and rather, the focus is on potential environmental impacts of a proposed action.<sup>8</sup> Moreover, the level of analysis of economic effects should be commensurate with the potential magnitude of those effects, and qualitative analysis is appropriate given the data typically available for a project at the planning/environmental review stage. This approach underlies the methodologies we have selected to assess the economic impacts within each of the four categories of analysis.

For each category, we identify the geographic and temporal boundaries for analysis, the data sources we will rely on, the technical analysis methods we plan to implement, and the impact indicators by which we will identify and measure any potential impacts. Our description of potential economic impacts will identify the direction, magnitude, timing, and distribution of impact. Although our scope of work does not specifically include an Environmental Justice (EJ) Analysis, our discussion of distributional effects would support the preparation of an EJ analysis under NEPA consistent with Executive Order 12898,<sup>9</sup> should this be required at a later date (again, SEPA has no such specific requirement).

---

<sup>5</sup> At this time there is no federal funding or federal action requiring federal review of the project under NEPA or any other federal statute. Should the project progress, however, NEPA review would be required as part of the federal permitting process. Anticipating this, the project team is preparing the SEPA EIS to support future NEPA analysis where possible and appropriate.

<sup>6</sup> Floyd|Snider and Washington Department of Enterprise Services. 2016. *Phase 1 Report on the Capitol Lake/Lower Deschutes Watershed Long-Term Management Planning*. December 30. Retrieved May 26, 2019, from <https://des.wa.gov/sites/default/files/public/documents/About/CapitolLake/2016MeetingDocs/ProvisoReport-Phase1-2016-12-30.pdf?b6c11>

<sup>7</sup> Environmental Science Associates. 2019. *Capitol Lake–Lower Deschutes Estuary Long Term Management Project Environmental Impact Statement: Scoping Report*. Washington Department of Enterprise Services. February 1. Retrieved May 27, 2019, from [https://capitollakedeschutesestuaryeis.org/Media/Default/documents/Scoping%20Report\\_022019Appendices\\_web.pdf](https://capitollakedeschutesestuaryeis.org/Media/Default/documents/Scoping%20Report_022019Appendices_web.pdf)

<sup>8</sup> See, e.g., Council on Environmental Quality. 2005. *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. Section 1502.23. Retrieved May 27, 2019, from [https://www.energy.gov/sites/prod/files/NEPA-40CFR1500\\_1508.pdf](https://www.energy.gov/sites/prod/files/NEPA-40CFR1500_1508.pdf)

<sup>9</sup> Executive Order 12898—Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. 59 FR 7629. February 16, 1994.



## 3.0 Economic Analysis Methodology

In the economic analysis, we will assess how each of the alternatives would produce changes in relevant economic variables compared to the No Action Alternative within each of the four analytical categories identified above. The primary inputs to this assessment are the findings of the environmental impact assessments from other technical disciplines, which identify the incremental physical impacts of each project alternative to environmental resources (e.g., water quality, fish and wildlife, and sediment transport). As these physical impacts interact with economic systems, they precipitate economic effects, which we identify, describe, and measure where possible. For this reason, we have worked closely with the resource specialist team to align this methodology with the other proposed methodologies so that wherever possible, the outputs of the other analyses provide useful inputs to the economic analysis. Through this coordination process, we've designed the economic analysis methodology to use the best available information expected from the other resource disciplines. The level of detail expected for the findings of the economic analysis reflects the data limitations in the analyses that provide inputs to the economic analysis.

In this section, we outline the specific analytical assumptions, data sources, technical methods, and indicators we propose to use in the economic analysis of the project for each of the four categories of analysis.

### 3.1 IMPACTS TO ECONOMIC ACTIVITY DOWNSTREAM OF THE PROJECT AREA

#### 3.1.1 Mechanism of Economic Effect

Navigation-dependent entities (e.g., the Port of Olympia and private marinas) north of the 5<sup>th</sup> Avenue Dam in Budd Inlet (downstream of the project area) are sensitive to sedimentation impacts. Sedimentation, if not properly addressed, could obstruct navigation and result in a reduced capacity to operate in the inlet. We will assess this category across two dimensions: (1) changes in economic values

(costs and benefits<sup>10</sup>) and (2) changes in economic impacts (jobs and incomes). The primary effect in both cases would arise from potential changes in dredging costs and other potential costs imposed by the project alternatives.<sup>11</sup>

- **Economic Value.** Managing sediment is a common cost of doing business for water-related businesses (e.g., ports and marinas). Changes in physical and natural infrastructure that change sedimentation patterns may increase or decrease the cost of management, resulting in benefits or costs to affected entities. Costs materialize as businesses direct spending to sediment management and away from other opportunities. These costs could materialize through direct payments for private dredging activities, or increased taxes or fees paid as part of a cost-sharing agreement to address dredging on a public or community basis. Other project elements may also impose costs on business entities, either directly, or through temporary disruptions in business activity.
- **Economic Impacts.** When costs increase or business activities change in response to changes in sediment management patterns or other project-related costs, spending patterns are likely to change as well. These changes in spending patterns result in changes in the level of jobs and income in an economic region.

### 3.1.2 Study Area

The study area for this category is the relevant market within which public and private entities operating downstream of the project area interact. Although the project's sediment impacts are unlikely to directly affect entities outside of Budd Inlet, the relevant market within which these entities operate encompasses Thurston County. This analysis addresses the project requirement (ESSB 6095) to consider an expanded area around Budd Inlet, including the Port of Olympia, for the economic analysis.

### 3.1.3 Time Horizon

This analysis will consider economic conditions and potential effects over a period of 30 years to balance the need to evaluate long-term expected economic outcomes without making inferences on uncertain conditions far into the future. This time horizon is consistent with the period used during EIS alternatives optimization. Construction costs will be assessed as an annual average over the construction period, which likely will vary by alternative. Operation and maintenance costs will be annualized over the operating period.

---

<sup>10</sup> While we will describe changes in economic value in terms of costs and benefits in this and subsequent analyses, we are not conducting a benefit-cost analysis, which is a specific tool that captures and standardizes flows of benefits and costs across time and facilitates comprehensive comparison of alternatives.

<sup>11</sup> Funding for and distribution of project costs are being evaluated by the Funding and Governance Working Group as part of the Capitol Lake–Lower Deschutes Estuary Long Term Management Project.

### 3.1.4 Data Sources

The following sources will serve as inputs to the analysis:

- Descriptive information about the scale, scope, and trends in the regional economy, including employment and income, which will help inform the description of the study area for the No Action Alternative. Quantitative information is available from the U.S. Census Bureau, Bureau of Economic Analysis, Bureau of Labor Statistics, and Washington State Office of Financial Management. Additional contextual information on local economic trends may be available from Chambers of Commerce and other non-governmental sources.
- Direct and secondary documentation of frequency and magnitude of historical dredging costs downstream of the project area. Using this information, we will describe and quantify the No Action Alternative. For additional detail and/or confirmation of source data, we likely will conduct key-informant interviews with representative of downstream businesses, such as the Port of Olympia.
- Sediment modeling results and engineering cost estimates and timing for sediment management activities, by alternative. This information will come from the project engineering team.
- Description of changes in access (e.g., temporary and permanent changes in access to marinas, temporary changes in access for the railroad, and temporary and permanent changes in access to local businesses related to changes in the 5<sup>th</sup> Avenue Bridge) translated into costs where possible, by alternative. The transportation impacts will be evaluated in a separate report, which we will use as a basis for estimating costs associated with access disruption, based on either direct costs or lost revenue. Changes in water-related access will come from the findings of the sediment and engineering reports (if access is related to construction staging) and will be estimated based on direct costs or lost revenue.
- Description of other categories of costs directly or indirectly related to the project (i.e., changes in regulatory costs for LOTT Clean Water Alliance and other entities operating within or downstream of the project area).
- Total direct expenditures, based on planning-level cost estimates, for construction and operation and maintenance activities, by spending type, by alternative. This information will come from the project engineering team.
- Total direct employment estimates, by labor category, for each alternative. We will develop this information with assistance from the project engineering team.

### 3.1.5 Technical Analysis

We will assess the changes in economic value (costs and benefits) in the study area based on the available data sources described above. We will quantify these costs and benefits within the time period

of analysis, and describe the distribution of costs and benefits among the impacted entities downstream of and in the vicinity of the project area. This analysis will include an assessment of changes in regulatory costs. These costs will come from available studies from LOTT Clean Water Alliance and others, who have estimated increased regulatory costs associated with environmental conditions that correspond to conditions likely to occur under the alternatives.

We will assess the economic contributions of the project (changes in jobs and income) arising from spending during construction and operation (including both direct operating costs and indirect costs arising from changes in management) using the IMPLAN economic input-output model for Thurston County. IMPLAN is an industry-standard model that traces how spending in one part of the economy creates employment and economic output in other parts. That employment, in turn, puts money in the hands of workers and business owners who buy goods and services from others, causing additional output and employment effects. Using this model, we will estimate the gross impacts arising from project-related spending, and not take into account the net impacts or opportunity costs of the spending (i.e., what effects on employment and economic output might have happened if the money had been spent in other ways unrelated to the project).<sup>12</sup> Construction costs will be evaluated as a lump sum for each alternative, with a description of how spending may be distributed over time if patterns differ across alternatives. Operation and maintenance costs will be annualized to provide an average annual value of spending over 30 years.

### 3.1.6 Impact Indicators

Impact indicators include the following:

- Average annual project spending as a percent of annual gross domestic product in the study area.
- Average annual project-related employment as a percentage of annual employment in the study area.

## 3.2 IMPACTS TO DOWNTOWN DEVELOPMENT

### 3.2.1 Mechanism of Economic Effect

Stakeholders involved with various phases of Capitol Lake management planning have expressed interest in understanding if changes in the characteristics of the lake could potentially influence commercial or residential development opportunities in downtown Olympia. Environmental and aesthetic amenities are among the factors that may affect demand for economic expansion and development. Changes in demand can affect the price and value of both current and future development opportunities. As a result, the project alternatives could increase, decrease, or have no effect on the value of downtown development.

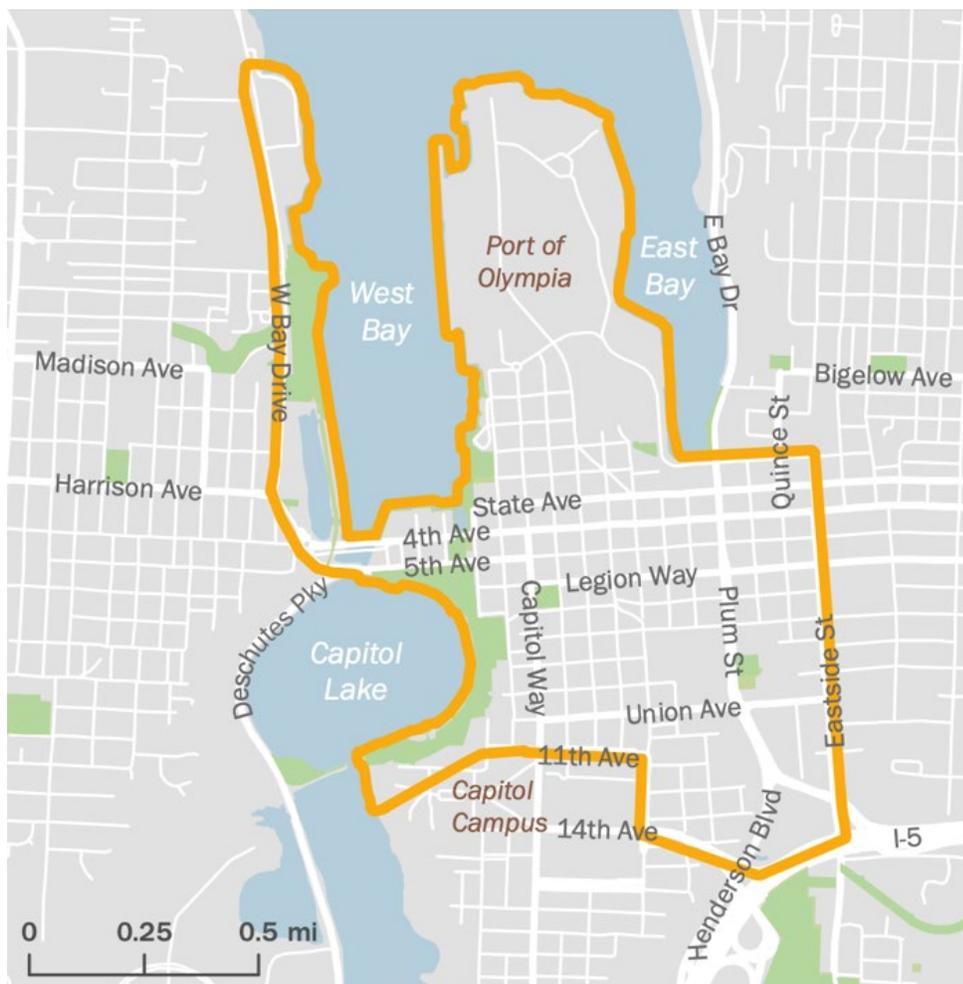
---

<sup>12</sup> Evaluating the net impacts or opportunity costs of alternatives to the spending that would occur on this project would require making assumptions and performing research that is outside the scope of the project.

### 3.2.2 Study Area

The relevant study area for this impact category is the Downtown Olympia Community Renewal Area Boundary (Figure 3.1). This boundary is the product of a recent community process to address blight, remove barriers to redevelopment, and initiate development partnerships with the Port in downtown Olympia.<sup>13</sup> In addition to its proximity, Capitol Lake is listed as a potential amenity in the feasibility study for the Community Renewal Area, and thus supports the use of this boundary to investigate the potential impacts of changes in the amenity on downtown development.

**Figure 3.1 Downtown Olympia Community Renewal Area Boundary**



Source: City of Olympia, Downtown Olympia Community Renewal Plan

<sup>13</sup> ECONorthwest. 2013. *Downtown Olympia Community Renewal Area Feasibility Study*. December 31. Retrieved May 28, 2019, from <http://olympiawa.gov/~lmedia/Files/CPD/Citizen%20Advisory%20Committee%20CRA/2014%20Documents/CRA%20Comp%20B%20Feasibility%20Study%20010614.pdf>

### 3.2.3 Time Horizon

The analysis will consider development conditions, changes in the amenity, and potential impacts over a period of 30 years to balance the need to evaluate long-term expected economic outcomes without making inferences on uncertain conditions far into the future. This time horizon is consistent with the period used during EIS alternatives optimization.

### 3.2.4 Data Sources

The following sources will serve as inputs to the analysis:

- Previous reports from the City of Olympia describing the relationship between Capitol Lake and trends in downtown development.<sup>14</sup> These reports will help describe the current and expected future trends under the No Action Alternative.
- Data on property characteristics and values from the Thurston County Assessor's Office. This will serve to describe the current baseline conditions of the No Action Alternative.
- Peer-reviewed and governmental literature on the relationship between changes in environmental amenities, such as rivers, lakes, estuaries, and shorelines, and changes in the market for urban development.
- Key-informant interviews with developers familiar with market conditions for residential and commercial development within the study area. We will draft a list of potential interviewees, including developers, business owners, and planners familiar with downtown Olympia development trends. The list will go through review with Enterprise Services and project work groups to ensure the list represent the full range of perspectives. We will develop a list of questions that will also go through a review process to focus the interviews and obtain a consistent set of responses related to (1) current and expected future trends in supply and demand for downtown development; and (2) expected effects on demand for development arising from changes in the quality of the amenity (described to interviewees based on potential effects of the alternatives on environmental conditions). Our interviewee selection process and interview procedures will acknowledge the potential for bias in this research approach. We will adhere to standard qualitative research techniques, including a standardized interview script that we will use across all interviews to ensure we are capturing different perspectives on the same questions, and the interview questions themselves do not lead to bias. Finally, we will verify wherever possible information obtained through the key-informant process with data sources and alternative sources of information.

---

<sup>14</sup> City of Olympia. 2017. *Olympia Downtown Strategy-Volume I: Summary*. January. Retrieved July 30, 2019, from <http://olympiawa.gov/~media/Files/CPD/Planning/Downtown/Downtown-Strategy/OlympiaDowntownStrategyV1SummaryDRAFT20170201.pdf?la=en>; City of Olympia. 2015. *Downtown Olympia Community Renewal Plan*. <https://static1.squarespace.com/static/597fb96acd39c34098e8d423/t/5984b2c3db29d66f894d4124/1501868741906/Downtown+Olympia+Community+Renewal+Plan.pdf>

### 3.2.5 Technical Analysis

The assessment of impacts to downtown development will be qualitative, focusing on identifying the mechanism, direction, magnitude, timing and distribution of the effects by alternative. Using data from the Assessor's office and previous studies of downtown Olympia, we will assemble a baseline description of the No Action Alternative that includes expected future trends in markets for development without the project. The qualitative analysis of the project alternatives will rely on conclusions drawn from the data sources described above (peer-reviewed literature with a focus on relevant case studies, and key-informant interviews) to describe the likely effect each alternative would have on the expected trends in downtown development compared to the No Action Alternative.

### 3.2.6 Impact Indicators

Impact indicators include the following:

- Likelihood of adversely impacting the demand for or supply of commercial and residential real estate in downtown Olympia. (Assessed qualitatively, i.e., "likely to increase," "likely to decrease," "likely to remain the same.")

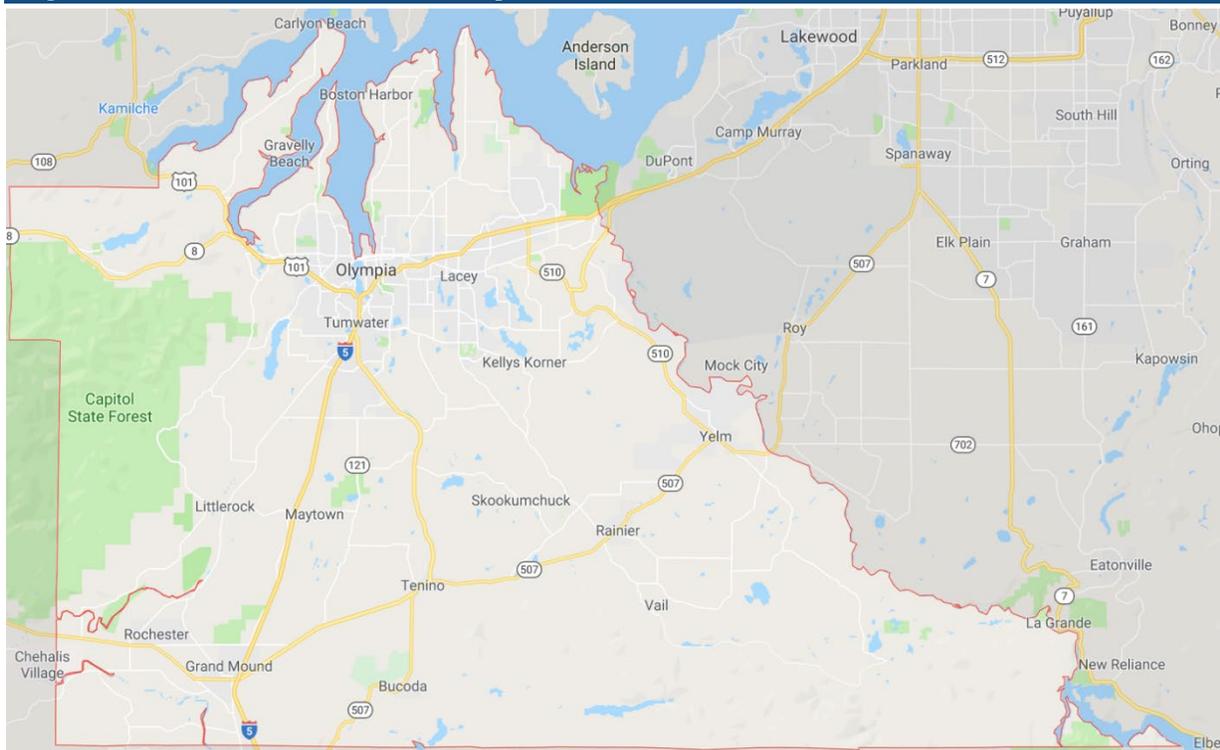
## 3.3 IMPACTS TO RECREATION

### 3.3.1 Mechanism of Economic Effect

Restoring active community use of the waterbody is an objective of the project alternatives. In-water recreation opportunities are currently prohibited, but are among the historic and potentially desired future conditions. Significant investment has occurred in parks and trails surrounding Capitol Lake that are enjoyed by both the local population and tourists. Alternatives that return Capitol Lake to estuarine conditions may result in a change to recreational opportunities within the waterbody and may affect in-water and near-shore recreation patterns of use nearby. Assessing the economic dimensions of changes in recreational use would involve describing the current and expected future demand and supply of recreation, both in the study area, and in the larger region where people who may use Capitol Lake spend their leisure time.

### 3.3.2 Study Area

The relevant study area for this impact category is Thurston County (Figure 3.2). This study area captures the recreation resources that complement and substitute for the recreation resources within the Capitol Lake Basin. Thurston County contains county, state, and federal resources upstream from the basin, downstream in Budd Inlet, and along the Puget Sound shoreline to the east and west of Olympia.

**Figure 3.2 Thurston County Recreation Areas**

Source: Google Maps

### 3.3.3 Time Horizon

The analysis will consider changes in the supply of and demand for recreation over a period of 30 years to balance the need to evaluate long-term expected economic outcomes without making inferences on uncertain conditions far into the future. This time horizon is consistent with the period used during EIS alternatives optimization.

### 3.3.4 Data Sources

The following sources will serve as the primary inputs to the analysis. Additional data sources are being investigated and may enhance the information available for the analysis.

- Descriptive statistics about current and expected future recreation demand and supply from publicly available data sources, including the Washington State Comprehensive Outdoor Recreation Plan (SCORP), Thurston County Parks, Washington State Department of Transportation, the U.S. Fish and Wildlife Service, and U.S. Forest Service.
- Survey data collected by the EIS Project Team. This survey will be implemented during the summer and fall of 2019, concurrent with field activities and planned events. This survey will provide both baseline data about current use of the Capitol Lake grounds to describe the No Action Alternative, expectations about future use of the waterbody, as well as past uses.

- Descriptions of the supply and relative scarcity of recreation opportunities under each alternative, from the Recreation technical analysis.
- Data on the value of recreation use by relevant activity, including both consumer surplus (from U.S. Forest Service survey data contained within the Recreation Use Values Database<sup>15</sup>) and spending patterns for local and non-local visitors, derived from economic literature.<sup>16</sup>
- Peer-reviewed literature related to how changes in the quality of recreation amenities and availability of recreation opportunities affect demand for recreation in similar contexts.

### 3.3.5 Technical Analysis

The assessment of impacts to recreational use will largely be qualitative, with supplemental quantitative analysis limited by data availability and quality. We anticipate being able to generate measures of the scale of use by activity and the potential total economic value associated with different categories of use. Where we are unable to estimate demand by alternative, we will describe potential impacts qualitatively, focusing on identifying the mechanism, direction, magnitude, timing and distribution of the impact by alternative, rather than quantifying a specific monetary value of changes in use. This analysis will address how changes in the supply of recreation opportunities may affect overall demand and value, and how changes in supply may change the distribution of recreation activity within the study area. Relying on published literature and existing data as available, the analysis will also attempt to address how the alternatives may change the overall distribution of demand among local and non-local recreation participants within the study area. This is relevant because non-local recreation participants are more likely to spend money in the region that would not have otherwise been spent, generating a net economic effect.

### 3.3.6 Impact Indicators

Impact indicators include the following:

- Change in supply of recreation (in terms of type, quantity, and quality) that are likely to positively or negatively affect the value of recreation in the region.
- Change in the supply of or quality of recreation opportunities that is likely to attract non-local recreation participation.

## 3.4 IMPACTS TO ECOSYSTEM SERVICES

### 3.4.1 Mechanism of Economic Effect

Ecosystem services describe the capacity of the ecosystem to provide goods and services that people value. Increases in the ecosystem's ability to provide goods and services produce economic benefits, as

---

<sup>15</sup> <http://recvaluation.forestry.oregonstate.edu/>

<sup>16</sup> Earth Economics. 2015. *Economic Analysis of Outdoor Recreation in Washington State*. Version 1.2. January. Retrieved May 28, 2019, from <https://www.rco.wa.gov/documents/ORTF/EconomicAnalysisOutdoorRec.pdf>

they increase the value people derive from the ecosystem. Conversely, decreases produce economic costs. These values may accrue as factors of production to industries (i.e., commercial fishing), extractive and non-market recreational use values of the broader ecosystem (i.e., fishing or birdwatching), or non-use values related to the health and function of the ecosystem. Based on preliminary screening conversations, the project alternatives have the potential to impact the supply of and value of the following ecosystem services:

- Water quality
- Habitat provision for threatened/endangered species
- Habitat provision for species important for commercial/recreational/subsistence purposes
- Carbon sequestration

The specific mechanisms of effect for each ecosystem service will depend on factors still in development based on alternative design and impact assessment. We will rely on information from each resource technical analysis (water resources, fish and wildlife, wetlands and vegetation, etc.) and translate it into relevant economic terms (e.g., monetary value, characterization of importance, qualitative descriptions of value). In some cases, technical analysis may find no change in an ecosystem service, or no variation in effect across alternatives. In this case, we will retain the service in the discussion and describe why it has no impact in economic terms. As the alternatives are refined and the EIS team completes the technical analyses for each resource, we may add additional ecosystem goods and services to the analysis.

### 3.4.2 Study Area

The relevant study area for this impact category will vary depending on the effect we're measuring. Changes in supply are measured within the study areas identified for measuring the biophysical impacts—the changes in ecological functions and processes that generate changes in the ecosystem's capacity to produce goods and services. Demand for these ecosystem services comes from populations that exist within and beyond the areas of direct physical impact (even globally in the case of carbon sequestration), and the analysis area will be large enough to capture the impacts to these populations.

### 3.4.3 Time Horizon

The analysis will consider changes in the supply of and demand for ecosystem goods and services over a period of 30 years to balance the need to evaluate long-term expected economic outcomes without making inferences on uncertain conditions far into the future. This time horizon is consistent with the period used during EIS alternatives optimization.

### 3.4.4 Data Sources

The following sources will serve as inputs to the analysis:

- Information from other resource technical reports to describe the change in the supply or quality of ecosystem services.

- Information describing specific demands for each ecosystem service will come from the project record, peer-reviewed literature, and key-informant interviews. Key-informant interviews will be most useful to identify specific demands and associated avoided costs associated with changes in the supply of ecosystem services. We will identify specific targets for interviews when we have more information on the physical effects likely to arise from the alternatives analysis for each resource.
- Peer-reviewed literature related to the value of ecosystem services, including the social cost of carbon, value of incremental changes in fish and wildlife populations and their habitat, etc.<sup>17</sup>

### 3.4.5 Technical Analysis

Ecosystem goods and services typically aren't traded in markets, so we would rely on non-market valuation techniques to assess changes in value, where changes in the supply of ecosystem services are likely to arise.

**Changes in Water Quality:** Should technical analyses find changes in water quality at a scale that has the potential to change the regulatory landscape (e.g., Total Maximum Daily Load development), those entities likely to face increased costs from regulation may experience reduced or avoided costs. These effects may be difficult to quantify with certainty, and we likely will approach this assessment qualitatively, based on findings from key-informant interviews with representatives of regulated entities.

**Changes in Habitat Provision for Threatened/Endangered Species and Recreation/Commercial/Subsistence Species:** Based on initial discussions with the project team, resource technical reports will be describing changes in habitats and resources qualitatively. Inferences on the economic implications of changes in species populations, incremental improvements in survival, or other metrics will thus also be described qualitatively. Information on general changes in the quality or quantity of habitat used by threatened/endangered species (e.g., salmonid populations) would be combined with stated preference survey data and/or fisheries data that indicate general economic importance of specific species in Puget Sound.

**Changes in Carbon Sequestration:** Should the project alternatives produce changes in the ecosystem's ability to sequester carbon either in water or on land by changing vegetation patterns, we would

---

<sup>17</sup> E.g., Batker, D. et al. *A New View of the Puget Sound Economy: The Economic Value of Nature's Services in the Puget Sound Basin*. Earth Economics. Retrieved May 29, 2019, from [https://www.floods.org/ace-files/documentlibrary/committees/A\\_New\\_View\\_of\\_the\\_Puget\\_Sound\\_Economy.pdf](https://www.floods.org/ace-files/documentlibrary/committees/A_New_View_of_the_Puget_Sound_Economy.pdf)

translate this change into economic terms using the federal guidelines for quantifying the social cost of carbon.<sup>18</sup>

**Changes in Amenity Value:** Changes in the environment may lead to changes in the quality or characteristics of views enjoyed by property owners in the area. The value this category captures is distinct from the potential changes in business activity, lease rates, or other pecuniary impacts measured within the analysis of impacts to downtown development, even though some of those impacts could be driven by changes in the quality of the view. Instead, this section captures potential impacts on property values in residences, primarily to the west of Capitol Lake. The study area for this analysis would correspond with the visual modeling sites used for the Visual Resources analysis. We intend to use research from economic literature to describe the range of potential impact on residential property value from changes in viewshed characteristics under each alternative.

**Changes in Cultural and Spiritual Values:** As changes in the environment occur that affect resources linked to cultural and spiritual values held by local tribes and others, we will describe these changes qualitatively. These values derive from the way people interact with and perceive the natural resources in the project area, and sense of place attached to the landscapes. For many of these values, caution should be taken in translating them into monetary terms, as there are no substitutes.<sup>19</sup>

Other relevant ecosystem services may emerge as the analyses unfold. To ensure we are capturing all potentially relevant effects, we will coordinate with the research team and continue to ask about specific potential effects. Should ecosystem services emerge that are not included on this initial list, we will address them using standard non-market valuation techniques used in ecosystem service assessment. In cases where data may be insufficient to estimate value, we will describe the economic importance qualitatively, characterizing the nature and timing of the benefits and potential beneficiaries.

### 3.4.6 Impact Indicators

Impact indicators include the following:

- Change in the supply of ecosystem services that serve as a factor of production for recreation and commercial fisheries, utilities, or other public or private entities.
- Change in the supply of ecosystem services that generate non-use values for the broader population.
- Change in carbon sequestration value.

---

<sup>18</sup> Interagency Working Group on Social Cost of Greenhouse Gases, United States Government. 2016. *Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis - Under Executive Order 12866*. August. Retrieved May 29, 2019, from [https://19january2017snapshot.epa.gov/sites/production/files/2016-12/documents/sc\\_co2\\_tsd\\_august\\_2016.pdf](https://19january2017snapshot.epa.gov/sites/production/files/2016-12/documents/sc_co2_tsd_august_2016.pdf)

<sup>19</sup> Hirons, M., C. Comberti, R. Dunford. 2016. "Valuing Cultural Ecosystem Services." *Annual Review of Environment and Resources* 41: 5.1-5.30