

# Economic Analysis of Outdoor Recreation at Washington's State Parks



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**Prepared By:**

Earth Economics  
Tacoma, Washington

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Washington State Parks and  
Recreation Commission  
Olympia, Washington

**Primary Authors:**

Greg Schundler, GIS and Research Analyst, Earth Economics  
Johnny Mojica, Research Analyst, Earth Economics  
Tania Briceno, PhD, Ecological Economist, Earth Economics

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The authors are responsible for the content of this report.

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## Foreword

The purpose of this study is to examine the economic effects provided by visitation to Washington's state parks. There are many ways to measure economic effects.

Take for example, the Seattle Seahawks. In 2013, the Seahawks made \$288 million<sup>a</sup> in stadium revenues. But what about the jerseys, bumper stickers, and t-shirts sold? How much money is spent on those goods? And what about those hundreds of bars where people watch the game and the game day barbeques we host at home? What about the gas we consume getting to and from the stadium? All of these expenditures influence the State's economy and can be attributed to the popularity of the Seattle Seahawks. Estimating the economic effects associated with that spending requires understanding what kind of purchases are being made, what industries supply these purchases, and how consumers and producers interact within a given geography.

Economic effects are layered and complex. First, an economic contribution analysis reveals the total spending associated with a sector, activity or policy. This spending begins with the direct purchases made in the region, or "direct contributions." "Indirect contributions" speak to the supply chain effects from these initial consumer purchases. So if that burger was made from a local producer, the restaurant would make a purchase from a farmer which would also be counted as a contribution (albeit indirect). "Induced economic contributions" speak to the salaries of all those employees who enabled your consumption, from the grocer to the bartender, and how they spend their money in the economy. Yet the economic value of our experience doesn't end there. What about the value of the memories, strengthening of relationships, and needed relaxation we gain from a day watching the Seahawks with friends? This is what economists call "consumer surplus," or the value above the price paid for a given good or service.

Similarly, Washington's state parks play an important role in driving economic activity as shown through different measurements: they encourage spending, attract recreation participants to rural areas, generate tax revenue for the state general fund, and provide accessible and valuable outdoor recreation experiences.

One place where the Seahawks and state parks are different, however, is ecosystem services. State park lands, rivers, lakes, wetlands, and beaches provide on-going value, even when they're not visited, such as habitat, storm water protection, and water provision. They are winning games whether players are on the field or not, even in the off-season.

This study estimates the full suite of economic effects provided through consumer spending associated with state parks and analyzes the value that state parks provide in both market and non-market benefits.

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## Glossary of Terms Used in this Study

*Consumer Surplus* – An economic measure of consumer satisfaction. In this study it refers to the difference a person is willing to pay for engaging in an outdoor recreational activity and actual expenditures incurred.

*Direct Effects* – Direct sales or margins of sales in the regional economy associated with an initial expenditure.

*Economic Activity* - Different types of economic exchanges in a region's economy which involve the production, distribution and consumption of goods and services.

*Economic Benefit* – The total increase in social welfare, including market and non-market values.

*Economic Contribution* – The economic effects that circulate throughout the local economy (in this case the state or county economy) as a result of an initial expenditure. Total economic contribution is made up of direct contribution, indirect contribution and induced contribution.

*Economic Impact* – The net changes in economic activity associated with the industry analyzed (i.e. outdoor recreation economy). For example, an impact accounts for new dollars flowing into the defined regional economy as a result of outdoor recreation opportunities.

*Ecosystem Service Value* – The measurement of economic benefits that people derive from ecosystems, many times expressed as non-market values or market value equivalents.

*Employee Compensation* – The total payroll cost of the employee paid by the employer. Included in this are wages, benefits and taxes.

*Equipment Expenditures* – Equipment expenditures are calculated based on the number of participants and average lifespan of the equipment good. They are classified as retail sales and are based on U.S. Census data yearly sales. These expenditures are attributed to the home state or county of the recreation participant.

*Expenditure Category* – Expenditures made by consumers of recreation, grouped into general categories of goods and services.

*IMPLAN* – Impact Analysis for Planning (IMPLAN) is an industry standard economic modeling software package to estimate total economic activity generated by expenditures in a regional economy. County and statewide IMPLAN models were used in this report.

*Indirect Contribution* – The economic effects generated by businesses buying goods and services from other local businesses. (e.g. intermediary inputs bought in the supply chain). A gas station buying gasoline refined in Washington State or a grocery store buying produce grown in the state creates an indirect contribution to the state's economy.

*Induced Contribution* – Economic effects resulting from the re-spending of income within the regional economy. For example, a Cabela's employee that uses their wages to buy locally-produced milk is creating an induced contribution for the Washington economy.

*Leakage* - Money that leaves the defined regional economy when an expenditure is made. For example, if a recreational boat has to be repaired in Washington, some of the parts needed for the repair may be ordered from California.

*Local and State Government Fees* – Any payment from recreation participants to local and state government enterprises, typically access fees. These could refer to camping, public boat launches, paying for a Discover Pass, or registering a snowmobile.

*Multiplier* - In this report the economic multiplier refers to the ratio between initial expenditures and total economic contribution (also called Keynesian multiplier). It shows how initial expenditures generate additional economic activity as the initial money is re-spent by other businesses and workers. An illustration of this follows below:

A hotel is paid \$150 to house a recreation participant for the night. The hotel owner keeps \$15 as profit, employees are paid \$85 and \$50 are spent importing goods from out of state (rent and taxes are ignored for brevity). The employees spend \$85 on food. Most of the food is imported from out of state so only \$10 of the expenditure goes to wages and profit for the grocery store. The hotel owner sends his \$15 to his daughter in California creating no further economic activity in Washington. Currently there has been \$110 (\$15 profit + \$85 wages + \$10 to grocery store) in economic activity from the initial \$150. If no further activity occurs then the multiplier will be  $0.73(110/150)$ .

*Participants (Recreation)* – People that engage in recreation irrespective of the frequency in which they engage in the activity.

*Recreation-related Expenditures* – Money spent on outdoor recreation, including equipment, travel and lodging, entrance fees, and food and beverages, among others. In this study, all expenditures were calculated in relation to Washington State recreational patterns. These expenditures are assumed to be made within Washington.

*Sector* - The economic sectors in this report refer to IMPLAN's sector categories. Each sector produces a unique good or service (gasoline, transportation, food and drink, medical care etc.). Each sector also has unique products, services, wages and profits that businesses in that sector purchase in order to operate.

*Tax on Production and Imports* – Taxes comprised of tax liabilities, such as general sales and property taxes. These taxes include non-personal property taxes, licenses, and sales taxes as well as federal excise taxes on goods and services.

*Trip Expenditures* – Spending that occurs in relation to a visit. Some examples of trip expenditures are food and beverages, transportation, and lodging. They are allocated to the destination site.

*Visit* – A single participant's visit to a recreational land or a one-time engagement by one individual in a recreational activity. For example, if a family of two adults and two children spent a day at a state park, it would be calculated as four Visits.

*Visitors* – Recreation participants originating from outside Washington State that visit one of Washington's State parks. In state residents are referred to as participants.

## Executive Summary

From ocean beaches to mountain waterfalls, hiking trails to swimming areas, Washington's state parks provide access to a diversity of outdoor recreational experiences across the state. The spending associated with these recreational experiences and activities have been contributing to Washington State's economy since the park system's founding in 1913. This report calculates some of the economic benefits of one of the nation's premier state park systems.

An analysis of economic activity associated with Washington State's park system reveals:

### **Consumer expenditures amount to \$1.5 billion per year.<sup>1</sup>**

- Expenditures associated with travel to state parks (e.g. gas, food, fees) amount to \$803 million per year.
- Purchases of outdoor recreation equipment (e.g. backpacks, boats, tents) which are used at least in part during the trip amount to \$721 million per year.

### **Economic contribution of state parks totals \$1.4 billion per year.**

- **Direct economic contribution is \$804 million per year.** Direct contribution refers to the portion of the initial consumer expenditures that recirculate throughout the state's economy. This excludes "leakages" of \$720 million for purchases of goods and services that come from outside of Washington State (such as the purchase of a backpack made in California).
- **Indirect economic contribution is \$259 million per year.** Indirect contribution refers to the economic effects generated by businesses buying goods and services from other local businesses (e.g. intermediary inputs bought in the supply chain). A gas station buying gasoline refined in Washington State or a grocery store buying produce grown in the state creates an indirect contribution to the state's economy.
- **Induced contribution is \$343 million per year.** Induced contributions are the economic effects resulting from the re-spending of income within the regional economy. For example, a Cabela's employee who uses wages to buy locally-produced milk is creating an induced contribution for the Washington economy.

### **The total economic contribution of state parks generates jobs and taxes.**

- **14,000 jobs.** Calculated as 14,000 jobs that include both full and part time jobs; primarily in the food & beverage, retail, wholesale trade and petroleum-related sectors. It does not include jobs resulting from government investment.
- **\$212 million in annual federal, state, and local tax collections,** including \$64 million per year in state tax revenue contributing directly to the State general fund.

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<sup>1</sup> Government expenditures/funding of State Parks' lands (for capital improvements and operations) will also create economic activity, but are not quantified in this report.

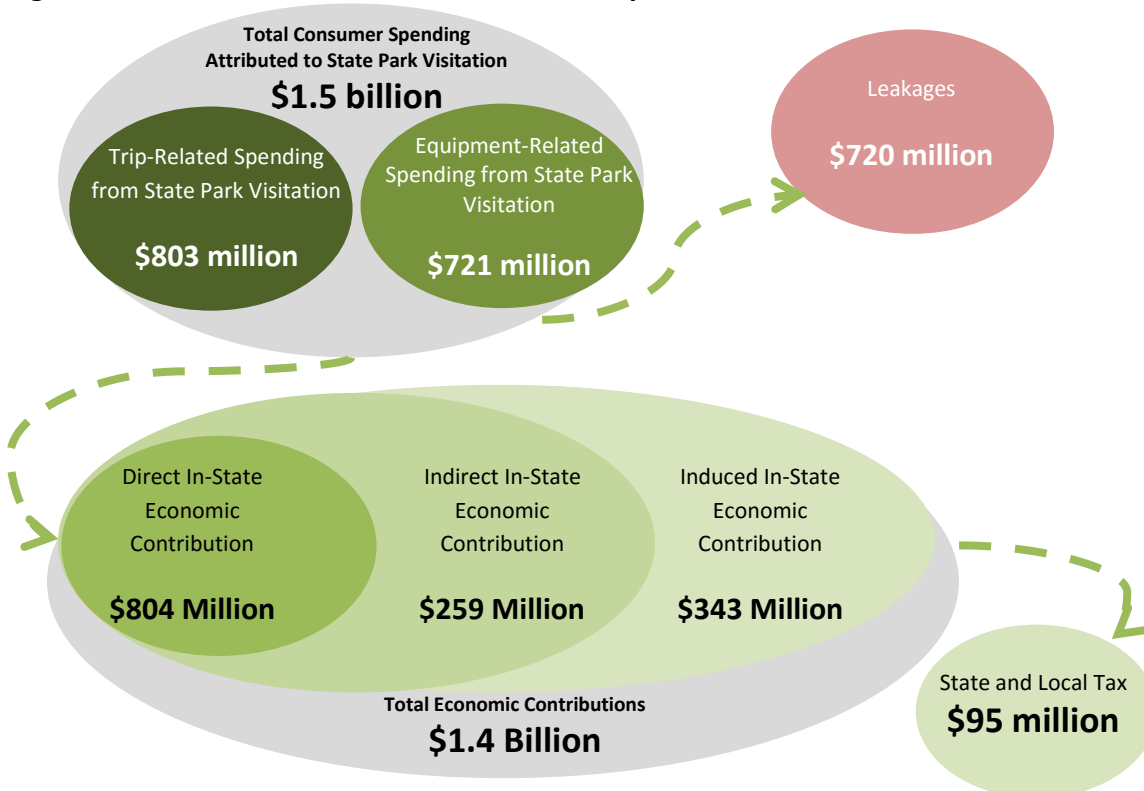


- By comparison, during the sample period the state park system received state tax support of \$20.4 million for the two-year 2013-15 biennium (\$10.2 million/year). State tax support for state parks in the 2015-17 biennium increased to \$31.1 million (\$15.6 million/year).

**Non-market benefits range between \$1.9 billion and \$2.5 billion per year.**

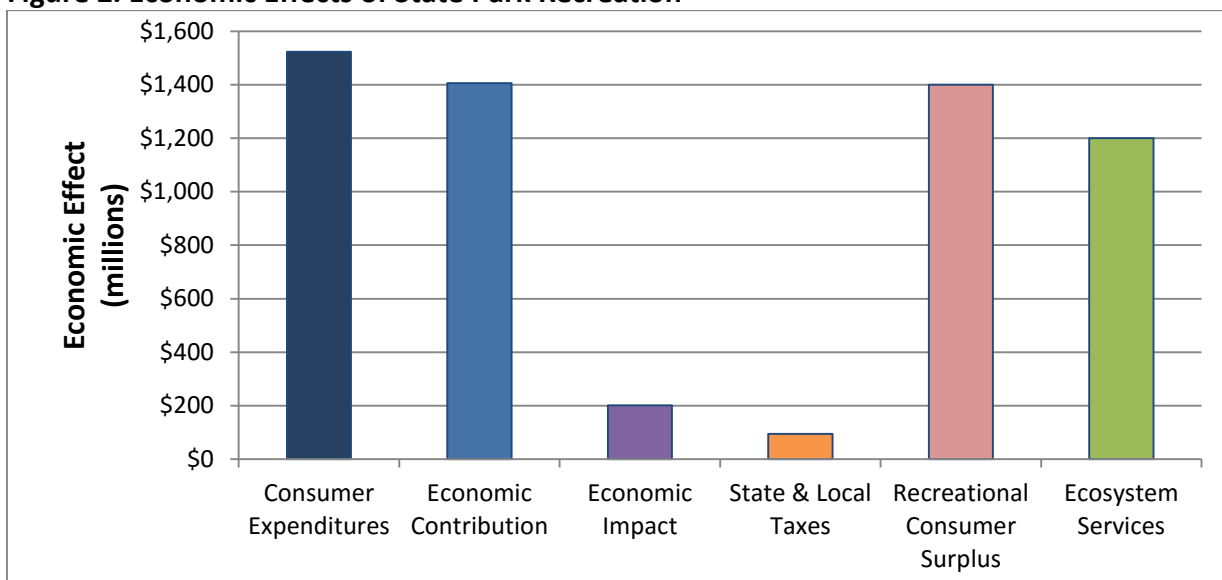
- **Recreation-related consumer surplus is \$1.4 billion per year.** Consumer surplus is an economic measure of consumer satisfaction. In this study it refers to the difference a person is willing to pay for engaging in an outdoor recreational activity and the actual expenditures incurred. The study found that the average visitor spends \$22.39 per visit and receives about \$40 in additional or 'surplus' value; or non-market benefits in the form of experienced satisfaction related to the recreational activity.
- **Non-market ecosystem services valued between \$500 million and \$1.2 billion per year.** Ecosystem service value is the measurement of economic benefits that people derive from natural ecosystems, often expressed as non-market values or market value equivalents. State lands produce ecosystem services such as aesthetic value, habitat for wildlife, and water filtration received by nearby communities. This study calculated the value of these three ecosystem services, although many more are likely being produced. For example, flood protection, pollination, and carbon sequestration are examples of other benefits being provided by state parks, which were not included in this valuation.

**Figure 1. Flow Model of Outdoor Recreation Expenditures**



The magnitude of each type of economic effect is also illustrated in Figure 2.

**Figure 2. Economic Effects of State Park Recreation**



This study shows that state parks are essential assets in the outdoor recreation economy and serve as a vehicle for rural economic development. On average, state parks capture 8% of all outdoor recreation participation. State Parks are *the* major facilitator of the outdoor recreation economy in Pacific, Grays Harbor, Island, and San Juan counties, attracting as much as \$2,500 in consumer expenditures per county resident.<sup>2</sup> This analysis shows that through outdoor recreation there is a large **transfer of wealth from the urban to rural counties**. Expenditures associated with state parks tend to benefit smaller, local businesses and rural areas.

Not all economic contributions are the same; some industries do a better job at recirculating spending within the regional economy. For example, when a person spends \$20 on a trip to a movie theater, much of that \$20 immediately leaves the regional economy to production studios, movie theater chains and chain restaurants, while a small portion stays within the region, mostly in the form of employee compensation.<sup>b</sup> Spending associated with recreation at state parks tends to recirculate within the economy at a higher rate. This analysis finds that 51.5% of spending at state parks stays within the state. A British Columbia study<sup>f</sup> found that 45% of spending at local independent retailers stays within the region while only 17% of spending at national chains stays within the regional economy. **When money is re-spent within the region, more taxes, jobs, and income are created.**

In addition to a strong economic contribution, state parks provide a suite of economic benefits in the form of consumer surplus and ecosystem services which are not typically measured in a

<sup>2</sup> Consumer expenditures by county residents and county visitors divided by the number of county residents; this figure gives some measure of the State Park recreation economy in proportion to county populations.

traditional economic analysis. These benefits are worth much more to both the consumer and society than is actually paid for; both by the visitor and government. Accompanying recreation, state parks provide invaluable ecosystem services such as aesthetic value, habitat for wildlife, and water filtration. These ecosystem services are benefits that nature provides for free, given they are maintained. As natural land continues to be degraded, society is seeing increased costs in built infrastructure needed to substitute these services. State Parks helps to preserve and maintain one of Washington's greatest and most productive resources: nature.

This analysis of State Parks' economic contribution is a segmentation of a statewide study on outdoor recreation conducted earlier this year by Earth Economics; *Economic Analysis of Outdoor Recreation in Washington State*. Portions of the modeling and data have been extracted from the earlier report, making it a valuable companion tool for understanding the economics of outdoor recreation. The methodology to determining these various economic effects is described in this study. Data sources, underlying assumptions, calculations, and concepts are explained for each type of analysis. Explanatory maps, figures, and graphs are used to illustrate results. Attendance data is from *Economic Analysis of Outdoor Recreation in Washington State*, which takes data from calendar year 2012 and provided by the Washington State Parks and Recreation Commission. Environmental Learning Centers and Interpretive Centers have been included, which were not previously valued. See Methodology section for more information. All figures are given in 2015 USD.

## Chapter 1: Introduction

### 1.1 Purpose of the Study

The purpose of this study is to quantify the economic importance of outdoor recreation on lands and waters managed by the Washington State Parks and Recreation Commission (referred to as the Commission from here on). The Commission's mission is to connect all Washingtonians to their diverse natural and cultural heritage and provide memorable recreational and educational experiences that enhance their lives. This study examines the contributions to local economies made through expenditures during state park visits and the non-market benefits derived from the existing recreational opportunities and from the natural lands being managed by State Parks.<sup>3</sup> It is also shown that state parks provide an important economic and geographic bridge and a "gateway experience" between local and national parks, providing authentic outdoor recreation experiences to potentially all Washingtonians. In certain counties, including Pacific, Grays Harbor, Island, and San Juan (see Figure 3), State Parks is *the* major facilitator of the outdoor recreation economy.

The study looks at various participant categories: day versus overnight, local versus non-local, in-state versus out-of-state, and water versus non-water based recreation. The expenditures made by each type of participant determine the business sectors that will be affected and the magnitude of the economic effects. Accessibility and land conservation efforts are also important attributes for non-market benefit assessments. Results are given at the state, county and legislative district level.

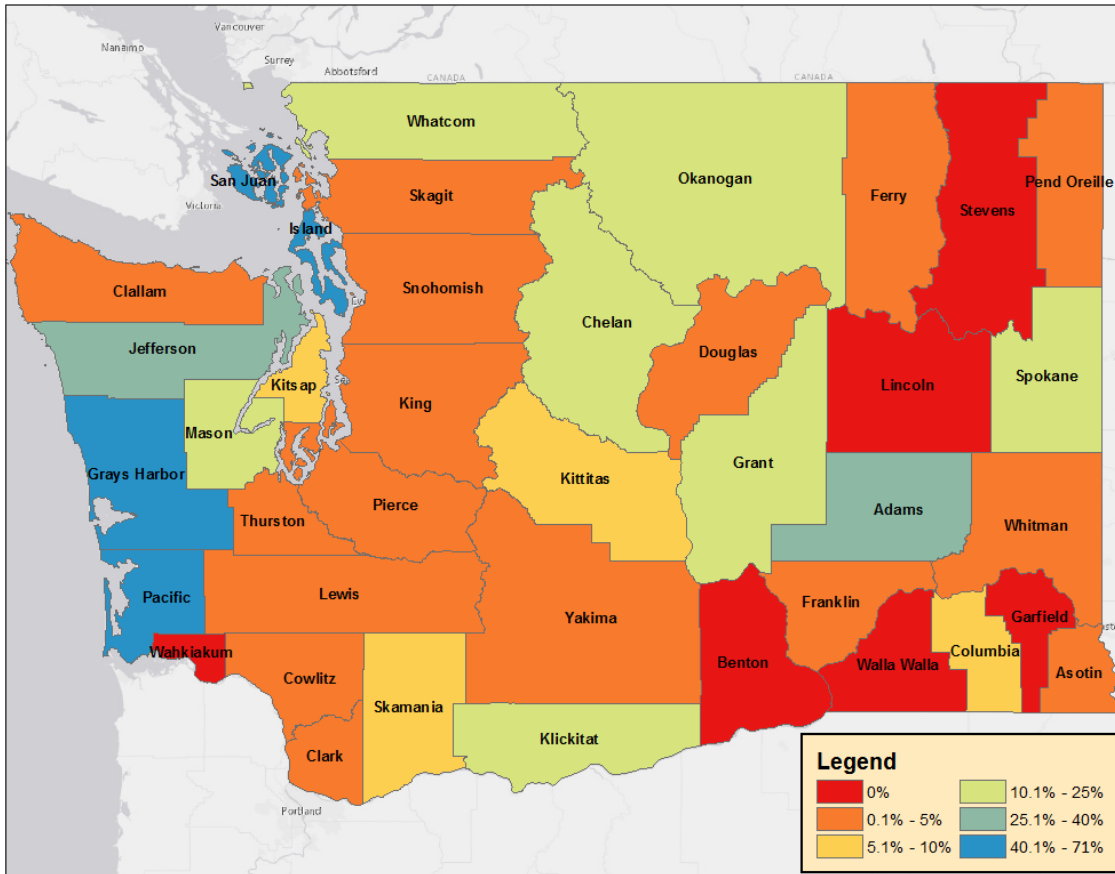
Figure 3 shows the importance of state parks on a county scale relative to total outdoor recreation activity. The percentages shown in Figure 3 represent, per county, the total number of state park visits (counted by the Commission) divided by the total number of outdoor recreation visits including participants on public<sup>4</sup> and private recreation lands. Outdoor recreation participation data was drawn from the Economic Analysis of Outdoor Recreation in Washington State<sup>ec</sup> which combined participation data from nearly all outdoor recreation lands including those managed by city, county, state, federal, and private entities. State parks are diverse with some parks playing the role of local parks and others playing a role more similar to that of National Parks or Recreation Areas. Ultimately state parks provide accessible outdoor recreation experiences to residents and visitors of Washington.

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<sup>3</sup> A handful of State Park lands are managed by third parties.

<sup>4</sup> Includes visits at lands managed by the National Park Service, US Forest Service, US Fish and Wildlife Service, Bureau of Land Management, Army Corps of Engineers; Washington State Department of Natural Resources, Washington State Parks and Recreation Commission, Washington State Department of Fish and Wildlife, County Parks, City Parks, and local "events".

**Figure 3. Proportional State Park Visits to All Recreation Days**



## 1.2 Methodology Overview

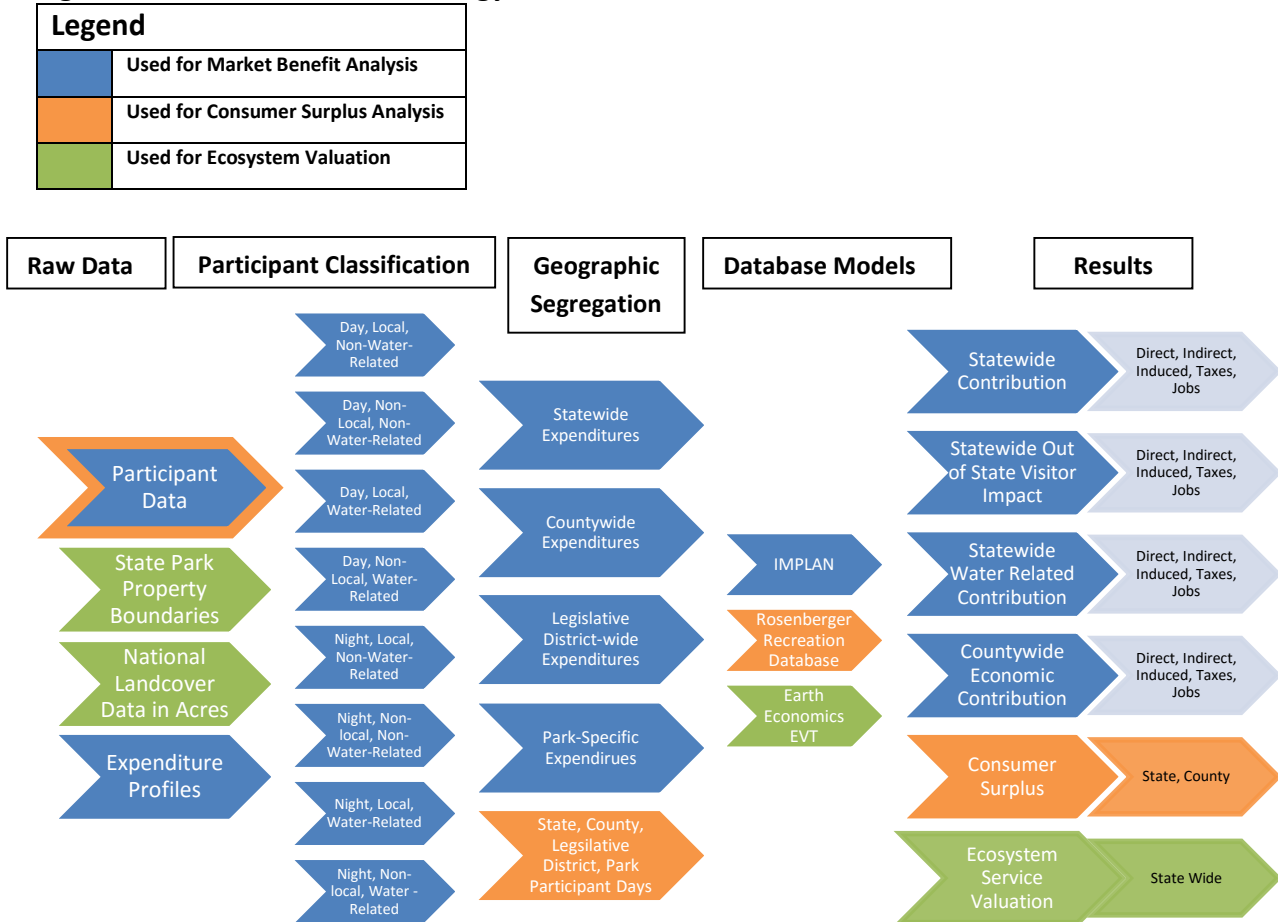
Outdoor recreational activities, retreats, and gatherings at state parks influence consumer spending in many economic sectors and their associated supply chains. Food and beverage purchases, restaurant visits, fuel and retail expenditures can, and usually do, accompany a state park visit. The spending per visit is calculated based on factors like participant origin, park location, park amenities and type of recreational activity. These factors are captured through some primary data collected for Washington state parks and through estimates and assumptions based on peer-reviewed literature, expert-validation, and GIS modeling.

The methodology for conducting the economic analysis of state parks requires data and assumptions on 1) participants, 2) their expenditures, and 3) the distance between participant residence and state park location. Figure 4 illustrates the different data components and steps for conducting the analyses. The process is outlined beginning with data collection for state parks, the identification of participant types, the creation of expenditure profiles, the calculation of total visits and expenditures per destination, and finally the economic analyses at different



geographical levels conducted with a series of economic analysis tools (IMPLAN<sup>5</sup>, EVT<sup>6</sup>, and Rosenberger’s recreation database<sup>7</sup>). Data sources for all the different components include existing studies on recreation, data recorded by individual parks, local surveys on recreation behavior, licenses and permits issued for specific activities, and when necessary, modeling of location-specific trends. In the following sections the different data components will be described in more detail.

**Figure 4. Overview of Methodology**



### 1.2.1 Participants and Visits

In this report, a participant is defined as the user, and a visit is the act of a participant engaging in state park recreation. Figure 5 below shows the different types of participants considered in this analysis and the assumptions used for each. To honor the diversity of state park uses, participant

<sup>5</sup> Impact Analysis for Planning, for more information on IMPLAN, see Box 1

<sup>6</sup> Earth Economics’ computational engine and valuation database, the Ecosystem Valuation Toolkit.

<sup>7</sup> A consumer surplus for recreation value database developed by Dr. Randall Rosenberger, Professor of Environmental Economics at the Oregon State University.

types, and park characteristics, it was necessary to build a matrix of eight (8) participant types based on three binary attributes: day/night, local/non-local, and water/non-water based recreation. Boaters are used as a proxy for water-related recreation, since recreation with boats typically carry higher expenditure profiles.

**Figure 5. Types of Participants to State Parks**

	Day	Overnight	Water-Related Day	Water-Related Overnight
<b>Local</b>	Day user living within 50 miles of the park.	Participant that stays overnight in the park & lives within 50 miles of the park.	Water-related participant that lives within 50 miles of the park and does not stay overnight in the park.	Water-related participant that lives within 50 miles of the park and stays overnight in the park.
<b>Non-Local</b>	Day user living further than 50 miles from the park.	Participant that stays overnight in the park & lives further than 50 miles from the park.	Water-related participant that lives further than 50 miles from the park and does not stay overnight in the park.	Water-related participant that lives further than 50 miles of the park and stays overnight in the park.

State parks participant data is collected on a monthly basis by the Commission for each state park venue, but not for other Commission-owned properties, such as undeveloped lands. The quality and reliability of visit estimations varies by park, since the resources available for monitoring and processing visitation at each state park are variable. The Commission collects day visit and overnight visit data.<sup>8</sup> It should be noted that these overnight counts are only for those lodging or camping within the park property boundaries. This analysis uses the same visit data as used in *Economic Analysis of Outdoor Recreation in Washington State*, with the inclusion of Environmental Learning Centers and Interpretive Centers, which were not previously valued.

The definition of what constitutes a local participant can vary. However, the tourism industry standard definition of “local” and “non-local” divides recreation participants by origin between those inside and outside a 50 mile radius.<sup>c</sup> The Commission does not currently collect information of the residence or place of origin of those visiting a state park. Therefore a GIS-based model was used to estimate the most likely place of origin using census population data. Three non-local and local participant types were created based on whether the park was designated as urban, suburban, and rural. “Rural,” “suburban” and “urban” have various definitions,<sup>9</sup> but are always relative to one another along a gradient. Since many state parks are

<sup>8</sup> The Commission refers to their participants as “visits.”

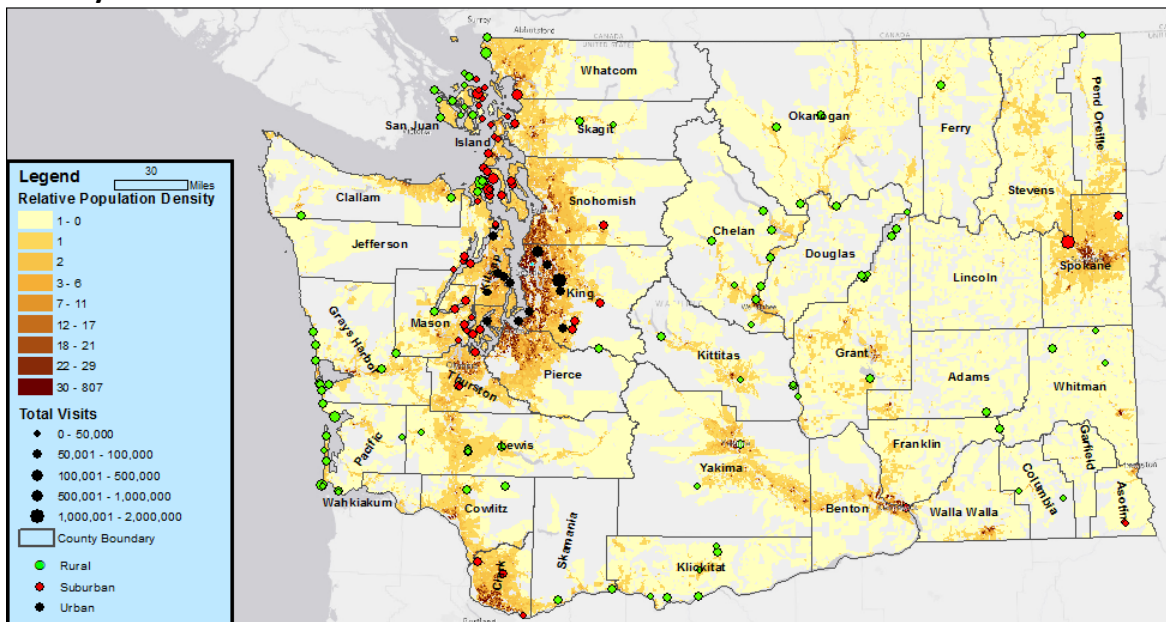
<sup>9</sup> The US Census Bureau, US Department of Education, and US Department of Agriculture have different operating definitions.

clustered together, are located in the highly indented Puget Sound, and are close to state/national boundaries, a 25 mile radius was chosen to minimize these effects in characterizing each park as rural, suburban, or urban. The separation of the parks into these categories can be seen in Figure 6, where state parks are color-coded by designation overlaying census block population density data. The total number of parks and participants per urban, suburban, and rural designations can be seen in Table 1. Please see Appendix A for methodology.

**Table 1. Total Number of Parks and Visits per State Park "Urban/Suburban/Rural" Designation**

	Number of Parks	Total Visits
"Urban"	15 (8.3%)	3,685,815 (10.3%)
"Suburban"	63 (35%)	14,290,146 (39.9%)
"Rural"	103 (56.7%)	17,871,809 (49.8%)

**Figure 6: Classification of Urban, Suburban, and Rural Parks Based on Census Population Density Data**



In order to estimate the contribution of "water-based recreation," boat-related visits were used as a proxy. The Commission collects data on number of launch permits sold; however, data on boat launch use is not presently collected by The Commission. Other studies<sup>d,h,i</sup> have found that about 3% of state park participants launch motorized and/or non-motorized crafts at state parks. Thus, it is assumed for all state parks with boat launches, that 3% of their participants are motorized or non-motorized boaters. To avoid double counting, "venues" are omitted since most of them share boat launches with a state park. Boating activity is important to track because outdoor recreational research shows boating is a high outlier in terms of activity and equipment spending.<sup>c</sup>

### 1.2.2 Expenditures

The economic analysis was carried out by converting 2012 state park visitation data into total consumer expenditures. Each of the eight participant types considered in this analysis had a unique “expenditure profile” per visit characterized by a unique ratio of purchases between fuel, food, restaurants, fees, and more. These assumptions were gleaned from other published studies that used survey data or borrowed data from other state and federal sources on “expenditure profiles”.<sup>c,h,i</sup> The diversity of participants and expenditure profiles can be seen in Table 2 in Chapter 2. All expenditure estimates are based on data of various vintages and are all converted to 2015 USD using the Bureau of Labor Statistics’ consumer price index.

### 1.2.3 Allocation to County and Legislative District

The matrix of participants and expenditures resulting from their activity was allocated to an attribute table in Esri ArcMap 10.3<sup>10</sup> for all relevant parks. All parks contained wholly within a legislative district or county boundary was assigned to that entity. For parks or trails that split between boundaries, the Commission advised on allocation ratios across boundaries.

### 1.2.4 Equipment Expenditures

In addition to trip-related expenditures made in conjunction with state park visitation, recreationalists also make equipment purchases. Whether tents, hiking shoes, or boats, it is assumed that these purchases are used for other forms of recreation as well. In the *Economic Analysis of Outdoor Recreation in Washington State study*<sup>c</sup> a total of 446,026,839 visits and \$8,974,243,491 in equipment purchases were measured for all forms of outdoor recreation in Washington State. Thus, with 35,847,770 total visits, state parks represent 8.04% of all outdoor recreation in Washington State. Assuming that this proportion scales in a similar way for use of recreational equipment, a rough estimation of equipment-related expenditures for state parks would be \$721,271,880.<sup>11</sup> Equipment expenditures are generally made near the place of residence of the recreation participant. Due to uncertainty of available recreation equipment providers, equipment related analysis is only carried out at the state level.

### 1.2.5 IMPLAN Analysis

Impact Analysis for Planning (IMPLAN) is an economic modeling software used to estimate economic contributions and impacts. It uses annually updated input/output models to describe the inter-sector economic relationships of a given geography (Box 1). As an input, IMPLAN models receive consumer expenditures per economic sector per geographic area. As a result

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<sup>10</sup> ArcMap is a GIS (Geographic Information System) software used for geospatial analysis and spatial data integration.

<sup>11</sup> In *Economic Analysis of Outdoor Recreation in Washington State*, equipment contribution was only valued at the state level across all land types.

expenditures are summed for all activities by IMPLAN sector at the state and county level (legislative district-level data and models are not available). As an example, expenditures on gasoline, whether for boats, automobiles, or off-highway vehicles, are summed into one sector. Input-output models may show, for example, that only a portion of expenditures on gasoline stay in Washington State, since most crude oil is delivered from outside the state.<sup>e</sup> Input-output models also calculate multipliers<sup>12</sup> for a given region (county or state) in order to quantify how much an initial expenditure is re-spent through the regional economy. For example, a county that has boat producers, boat repair shops, and boat retailers and is poised to capture more of the prices paid for boat-related goods and services. Generally, though not always, the less diverse a county or state-level economy, the more it must import in order to provide recreational goods and services.

### Box 1. IMPLAN: A Brief Primer

This study utilizes IMPLAN (Impact Analysis for Planning) which was developed by MIG, Inc. The IMPLAN modeling system has been in use since 1979 and was originally developed by the U.S. Forest Service. The economic data for IMPLAN comes from the system of national accounts for the United States based on data collected by the U. S. Department of Commerce, the U.S. Bureau of Labor Statistics, and other federal, state, and local government agencies. Models for local economies are often constructed from extrapolation of national and state data and relevant local data available. Using this data, IMPLAN constructs regional trade flow models to capture how spending in one industry impacts all other industries. This data captures regional relationships between the economic contribution of industries, jobs, income, and taxes. Based on these models, IMPLAN can calculate how an economic activity such as consumer spending on a specific industry will impact jobs and income for an entire region's economy.

This study used IMPLAN models for the entire state of Washington and for each of the 39 counties. Each of these models can capture the response of that regional economy to a change in demand or production in a given industry or group of industries. When consumer expenditures are entered, IMPLAN models how these expenditures will translate into jobs and incomes for the region. The model estimates how the expenditure will “ripple” through the economy. The industry experiencing the change in sales will need to purchase additional inputs from its suppliers (indirect contributions). Household spending also changes due to wage impact and job creation (induced contributions).

Continued on next page

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<sup>12</sup> Multipliers show how initial expenditures generate additional economic activity as the initial money is re-spent by other businesses and workers.



**Box 1. IMPLAN: A Brief Primer (cont.)**

The **economic contribution** models factor in geographic and demographic nuances including consumer spending patterns, local production capacity, and general trade flows to yield an estimate of in-region sales from the total expenditures made. In-region sales subtract the portion of purchases that ultimately flows out of the region (called economic leakage). In turn, the in-region sales are used to model tax revenues, ripple effects for local industries, and labor market effects. The sum of these ripple effects (also known as multipliers) yields the total economic contribution of an activity. In a separate calculation, the economic impact analysis identifies the influx of new money into the local economy as a result of outdoor recreation opportunities. This study estimates **economic impacts** in reference to out-of-state visitors.

**1.2.6 Economic Contribution, Impacts, and Benefits**

Although they are often confused as synonymous, an “economic contribution” is different from an “economic impact,” which is yet still different from an “economic benefit.” These are different measures of economic effects and they speak to the type of well-being change being experienced, the structure of the economy (sectors present and their interface), the boundary of the economy in spatial terms, and the producers and consumers acting in the economic framework. For policy and business purposes, researchers define economies at different scales: city, county, state, and national as well as in terms of market and non-market measures of well-being.

**Economic contributions** are the aggregate economic activity measured through market transactions within a given boundary that results from initial expenditures by consumers within that boundary. **Economic impact**, however, speaks to new money being generated within the boundary either from 1) improving the economic interactivity of sectors (i.e. increasing the multipliers) or 2) attracting increased spending from consumers originating from outside the regional economy. Thus, economic impact speaks to the “injection” of new money to markets, while economic contribution speaks to “circulation” of existing money. **Economic benefits** refer to measures of wellbeing beyond what is recorded through market transactions in a given boundary.

Economic contribution and impact analyses recognize the reality that there are substitutes for consumers within every possible geographic region of analysis. In this case, a consumer could choose to spend their recreation budget either locally or elsewhere and either on outdoor recreation at a state park or on movies, bars, or other activities. These decisions translate into different types of economic activity and consumer satisfaction. Since each regional economy has its own structure, it also has its own “multiplier,” the ratio of economic activity resulting from an initial expenditure. The higher the multiplier, the more money recirculates within the local

economy. Usually, the larger the geographic area, the more likely the economic structure will be comprised of diverse sectors, suppliers, and wage earners. This economic activity can be measured in terms of jobs, spending, salaries, tax collections, and industries' economic contribution. Other "economic benefits" beyond these measures may be described as "non-market benefits." This study quantifies and incorporates the dollar value of recreation related consumer surplus and ecosystem service benefits emerging from state parks to describe non-market economic benefits.

Decision makers are often interested in "economic impact" because it speaks to economic growth. Attracting new consumers, customers, and investors to a region is essential for increasing employment and earnings. Economic impact analyses are often associated with a new development, like a stadium, to describe how a community might benefit from an investment that attracts an injection of new spending in the local economy. In outdoor recreation and tourism economics, economic impact is usually brought by the spending of participants from outside the region. Thus, accurate data or defensible assumptions about the origin of consumers are essential to providing accurate economic analyses. Understanding and leveraging the attributes that attract participants is essential to maximizing the benefits provided by state parks. This study shows that unique attributes such as ocean beaches, islands, historical monuments, boat launches, architecture, or special amenities can motivate recreationalist travel and spending behavior as well as the co-benefits provided by natural lands.

Equally important to economic growth, however, is working to diversify and "tighten" regional supply chains within the regional economy. If new visitation or expenditures are difficult to generate, a regional economy may seek to encourage business models that recirculate more of the money already spent regionally. This side of economic impact is less studied, though discourse about the merits and drawbacks of "local economies" is increasing.

This analysis uses local data on economic and industry relationships to predict revenue flows to existing businesses (direct contributions), effects on related industries from which purchases are made (indirect contributions), and effects from expenditures made through the affected household incomes and salaries (induced contributions). Local economic models are derived using IMPLAN data from the U.S Bureau of Labor Statistics (BLS), U.S. Bureau of Economic Analysis (BEA), U.S Census Bureau and other sources.

## Chapter 2: Expenditures and Contributions of Outdoor Recreation Occurring on State Park Lands

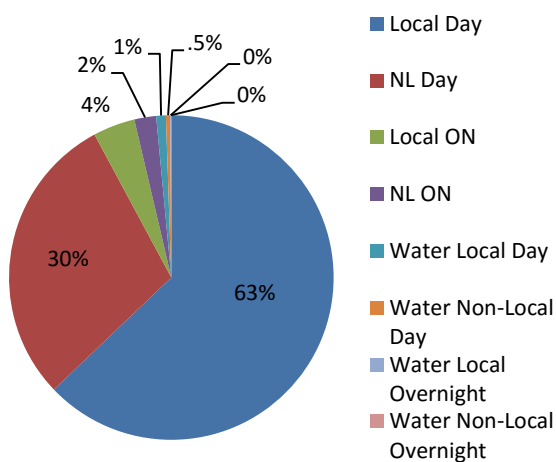
When a person visits a state park, they bring along spending with them, and as this report finds; \$803 million are spent in trip related expenditures state-wide each year. Some participants may not spend any money in the economy while visiting the park, while others buy groceries, stay in campgrounds, eat in local restaurants and buy from local shops. For state parks that are predominately used as local parks, the average spending tends to be lower. For parks that are in a more rural setting, with lower population density, there is a transfer of wealth from cities like Seattle and Spokane to rural parks in Pacific or Chelan County. It is hard to track where these participants originate from exactly but, as described in section 1.2.1, a ratio of local and non-local participants are assigned to each park based on the parks' surrounding population.

### 2.1 Economic Contribution of State Park Lands at the State Level

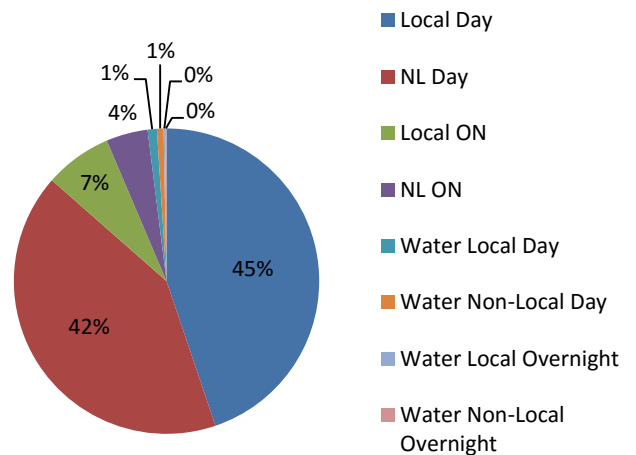
The economic activity associated with outdoor recreation in Washington state parks can be quantified for different regions. This study utilizes GIS to show the regional differences in consumer spending between counties and legislative districts. In the county map (Figure 10, section 2.2), urban (King, Spokane) and rural counties (Grays Harbor and Island) are represented.

Washington state parks are visited by a wide range of participants (See Figure 7). Each park will have a different mix of participant types as a result of park location, amenities available, and other park characteristics. In the Washington state parks system, it was calculated that the majority of participants were day visits, making up 33,677,043 visits and 94% of all visits, with local day visits making up 63% of all visits. Local day visits do make up a large portion of visits, but as a result of a lower expenditure profile, they represent only 44.75% of spending (See Figure 8).

**Figure 7. Washington State Park Visits by Type**



**Figure 8. Washington State Park Visits by Expenditures**



A summary of these participant types with participation days, per-day expenditures and total expenditures is outlined in Table 2. It is estimated that Washington residents and out-of-state visitors spend about \$803 million a year on recreation trips to Washington state parks. This estimate was done by multiplying visit counts provided by State Parks and expenditure profiles based on the type of participant. The average state park participant spends \$22.39 per visit.<sup>c,h,i</sup> A majority of state park visits are local day visits which have a lower expenditure profile.

**Table 2. Participant Categories and Related Expenditures**

	Visits	Percent of Total Visits	Expenditures	Per Visit
TOTAL	35,847,770	100%	\$802,498,641	\$22.39
Non-Water Related Recreation	35,280,847	98.42%	\$785,710,593	\$22.27
Local Day	22,488,922	62.73%	\$359,089,712	\$15.97
Non-Local Day	10,660,230	29.74%	\$339,969,751	\$31.89
Local Overnight	1,404,133	3.92%	\$53,545,519	\$38.13
Non-Local Overnight	727,562	2.03%	\$33,105,611	\$45.50
Water Related Recreation	566,923	1.58%	\$16,788,048	\$29.61
Water Local Day	362,097	1.01%	\$8,266,147	\$22.83
Water Non-Local Day	165,794	0.46%	\$6,205,706	\$37.43
Water Local Overnight	26,069	0.07%	\$1,266,541	\$48.58
Water Non-Local Overnight	12,963	0.04%	\$1,049,654	\$80.97

It is important to track what happens to the money once it is spent: does this money immediately flow out of the regional economy, or does it recirculate locally? State park participants tend to have expenditure profiles that favor the recirculation of money within the economy; they spend money at local restaurants, retail shops and grocery stores which in turn provide jobs to local employees and buy goods from both local and non-local producers.

IMPLAN was used to calculate region-specific economic contributions from spending associated with state park visits. Economic contributions are the economic effects that circulate throughout the local economy (in this case the state or county economy) as a result of an initial expenditure. As seen in Table 3, direct economic contributions from consumer trip-related expenditures totaled \$804 million. This direct economic contribution refers to the amount of money that recirculates within Washington State from initial expenditures. It does not include money that ultimately leaves the state, "leakages<sup>13</sup>," such as purchases for equipment manufactured outside

<sup>13</sup> Leakages are found by subtracting *direct economic contribution* from *total expenditures*.

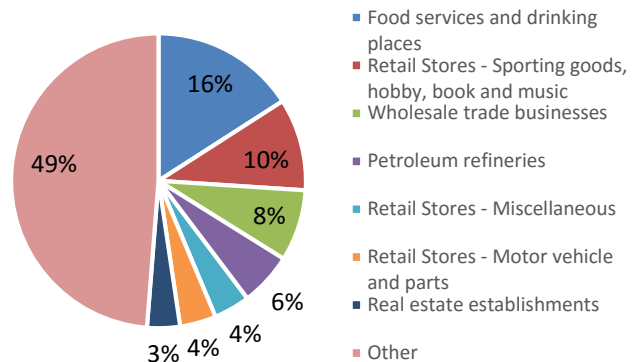
of the state. Indirect economic contributions on the state level totaled about \$259 million. Indirect economic contribution refers to money that is recirculated through a business' supply chain in regional purchases. This is where the effects of restaurants purchasing food from within Washington would accumulate a "local food" effect. Induced economic effects, estimated at \$343 million, count the money paid out to employees who help facilitate the economic activity associated with outdoor recreation at state parks. The salaries made by the bartender, river guide, or hotel housekeeper, are all spent at rates that accumulate their own effects. Individuals employed in the sectors that support outdoor recreation, tend to spend their salaries locally.<sup>f</sup>

Output Category	Total Contribution
Expenditures	\$1,523,770,521
↓	↓
Leakage	\$720,044,448
Direct Economic Contribution	\$803,726,073
Indirect Economic Contribution	\$258,518,471
Induced Economic Contribution	\$343,451,415
Total Economic Contribution	\$1,405,695,959

**Table 3. Total Contributions of Outdoor Recreation on State Parks Lands**

Outdoor recreation in Washington's state parks supports local businesses including food and beverage places, which account for 16% of total state park-related economic contribution, ultimately supporting approximately 3,500 food and beverage jobs in Washington. As seen in Figure 9, the "other" category encompasses 49% of total contribution, which represents 394 industry sectors. Many of these "other" industries do not receive consumer expenditures, but benefit from indirect and induced expenditures. They include waste management, insurance, banks and many other industries. All in, 401 of the 432 industry sectors in Washington State are influenced by state parks.

**Figure 9. Total Contribution by Top Industries**



Industry	Total Contribution
Food services and drinking places	\$223,747,000
Retail Stores - Sporting goods, hobby, book and music	\$142,161,316
Wholesale trade businesses	\$110,234,461
Petroleum refineries	\$82,072,645
Retail Stores - Miscellaneous	\$55,821,794
Retail Stores - Motor vehicle and parts	\$55,755,739
Real estate establishments	\$50,735,829



As consumers buy products and services, and businesses stimulate their supply chains and pay salaries that induce more spending, tax contributions accumulate to \$95 million in local and state taxes (see Table 4), and \$117 million federal taxes. The largest generator of local and state tax revenue is taxes on production and imports.<sup>14</sup> These taxes largely include sales tax, property tax and motor vehicle tax and contribute at least \$64 million in tax revenue to the Washington State general fund.<sup>15</sup> 2011-13 General Fund Budget for Washington State was \$31 billion. Figure 16 in Appendix C shows that 49% of the State budget is funded by sales tax.

**Table 4. Local and State Tax Impact Contribution of State Parks**

Category	Total
Employee Compensation	\$841,870
Proprietor Income	\$0
Tax on Production and Imports	\$91,781,446
Households	\$2,274,240
Corporations	\$65,990
Total	\$94,963,546

## 2.2 Economic Contribution of State Park Lands at the County Level

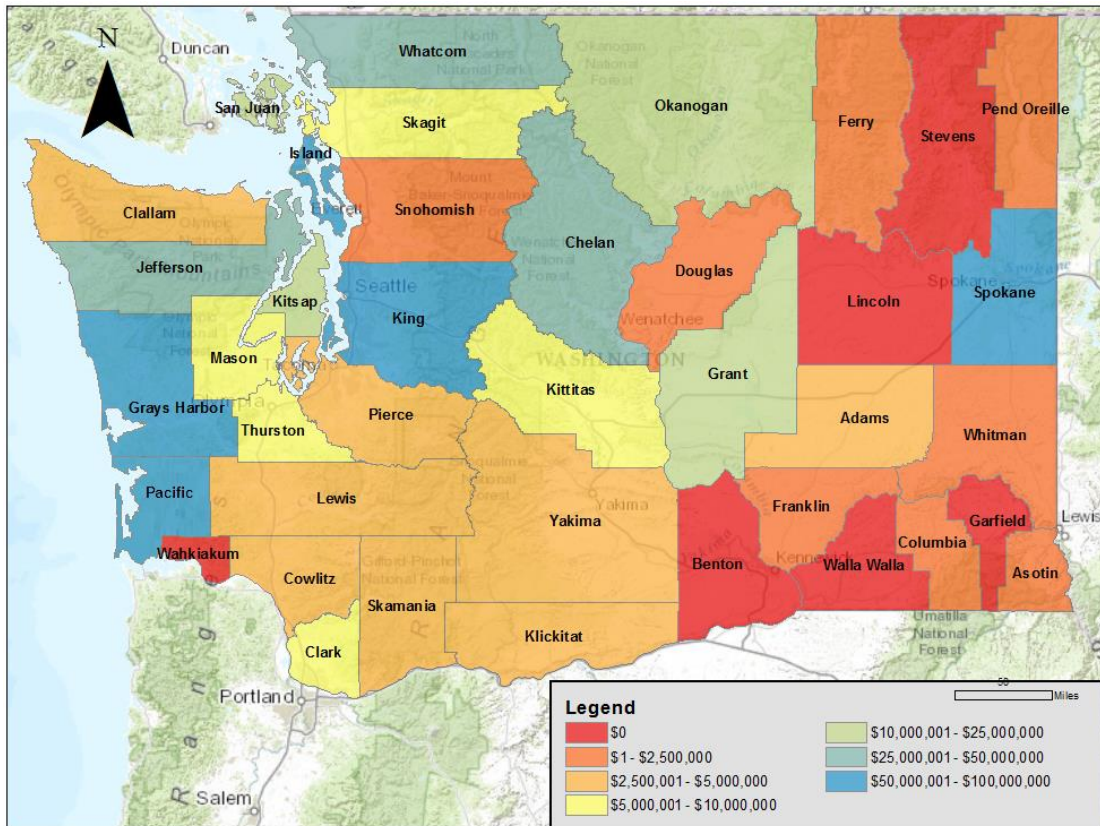
Of the 39 counties in Washington, 33 contain at least one state park. For certain counties, state parks are the main source of outdoor recreation as seen in Figure 3 of section 1.1. This map shows the total participation days at state parks as a ratio of total participation days for almost all forms of outdoor recreation. Washington State Parks is the largest provider of recreational opportunities in Island County, Grays Harbor County, Pacific and San Juan County.<sup>d</sup> These four counties make up over a third of all state park participation days.

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<sup>14</sup> Taxes on production and imports (TOPI) consist of tax liabilities, such as general sales and property taxes. TOPI is comprised of state and local taxes—primarily non-personal property taxes, licenses, and sales and gross receipts taxes—and Federal excise taxes on goods and services. —Bureau of Economic Analysis.

<sup>15</sup> Washington state sales tax is 6.5% of sales. Total sales tax varies from county to county and can be as high as 9.5%. Here, it is assumed that 70% of tax revenue contributes to the state general fund.

**Figure 10. Total Economic Contribution from Consumer Expenditures associated with State Parks by County**



The flow of consumer spending through the economy depends on the boundary of that economy and what is considered “inside” and “outside” that region. Figure 10 above illustrates consumer spending associated with state park recreation for each county. Every region has a unique economic architecture with different demographic and geographic qualities. Indeed each nation, state, and county has its own composition of economic actors (consumers, suppliers, and businesses), built capital infrastructure, and natural capital infrastructure. This study examines the economic effects of state parks within their respective county economies. The economic make-up of each unique state park affects the multiplier of each region, which can be found by dividing the *total economic contribution* by the *total expenditures* found in Table 5. The multiplier summarizes the many sectors that consumers patronize and all the geographically unique mix of industries that determine how much an initial expenditure is recirculated within the region and how much additional spending happens. If an employee of a hotel in Pierce County lives in Thurston County, a large portion of his/her wages will leave the county, resulting in a lower multiplier. The same can happen with food purchases by restaurants; much of a restaurant’s food may be purchased outside of the county, resulting in low circulation of money within the county.

This analysis has also estimated jobs resulting from consumer expenditures made in relation to recreating on state park lands. These jobs range from hospitality to retail shop workers (direct

jobs) as well as farmers and sanitation workers (indirect jobs). Not included in the jobs estimates are jobs resulting from government investments in State Parks.

**Table 5. County Level Analysis of State Parks Lands**

County	Total Expenditures*	Total Economic Contribution	Jobs	State & Local Tax
ADAMS	\$5,239,978	\$3,038,006	40.3	\$262,498
ASOTIN	\$1,111,292	\$685,480	9.4	\$52,334
BENTON	\$0	-	-	-
CHELAN	\$29,310,238	\$26,807,919	328.6	\$1,996,829
CLALLAM	\$4,889,908	\$3,275,124	42.6	\$246,922
CLARK	\$10,033,535	\$7,788,714	91.5	\$557,786
COLUMBIA	\$1,454,565	\$637,345	9	\$51,592
COWLITZ	\$4,501,872	\$2,876,696	37.7	\$214,381
DOUGLAS	\$1,984,345	\$1,074,986	14.2	\$92,220
FERRY	\$1,581,887	\$469,485	5.5	\$29,983
FRANKLIN	\$3,607,866	\$2,006,217	24.5	\$127,883
GARFIELD	\$0	-	-	-
GRANT	\$35,739,828	\$22,560,869	281	\$1,803,307
GRAYS HARBOR	\$106,685,053	\$67,887,747	844.8	\$5,057,316
ISLAND	\$91,062,317	\$51,672,282	774.4	\$4,263,575
JEFFERSON	\$57,695,645	\$36,167,505	515.6	\$3,026,035
KING	\$74,992,266	\$71,385,787	776.4	\$4,416,417
KITSAP	\$16,176,207	\$11,823,920	153.9	\$839,423
KITTITAS	\$8,693,421	\$5,890,447	88.9	\$462,350
KLICKITAT	\$9,797,791	\$3,944,899	44.2	\$284,722
LEWIS	\$6,611,511	\$4,126,292	51.4	\$303,844
LINCOLN	\$0	-	-	-
MASON	\$22,358,774	\$9,736,296	123.1	\$763,098
OKANOGAN	\$18,419,577	\$12,174,716	158.3	\$915,119
PACIFIC	\$89,236,761	\$50,576,912	702.3	\$3,943,058
PEND OREILLE	\$108,133	\$35,611	0.5	\$2,925
PIERCE	\$5,017,681	\$3,693,729	41	\$230,374
SAN JUAN	\$31,528,548	\$23,169,985	295.9	\$1,782,205
SKAGIT	\$9,787,002	\$7,524,585	85.8	\$477,887
SKAMANIA	\$7,824,822	\$3,788,887	54.9	\$317,633
SNOHOMISH	\$5,993,598	\$3,834,824	50.2	\$265,630
SPOKANE	\$85,563,590	\$95,417,961	979	\$6,020,284
STEVENS	\$0	-	-	-
THURSTON	\$9,956,319	\$6,885,210	83.8	\$542,112
WAHIAKUM	\$0	-	-	-
WALLA WALLA	\$0	-	-	-
WHATCOM	\$39,024,996	\$38,263,028	407.4	\$2,398,906
WHITMAN	\$3,117,445	\$1,625,161	21.3	\$132,279
YAKIMA	\$3,391,871	\$2,559,622	31.2	\$189,335
<b>WASHINGTON**</b>	<b>\$1,523,770,521</b>	<b>\$1,405,695,959</b>	<b>14,081</b>	<b>\$94,963,546</b>

\*County results do not include equipment contribution.

\*\*County totals do not total to Washington results due to leakages.

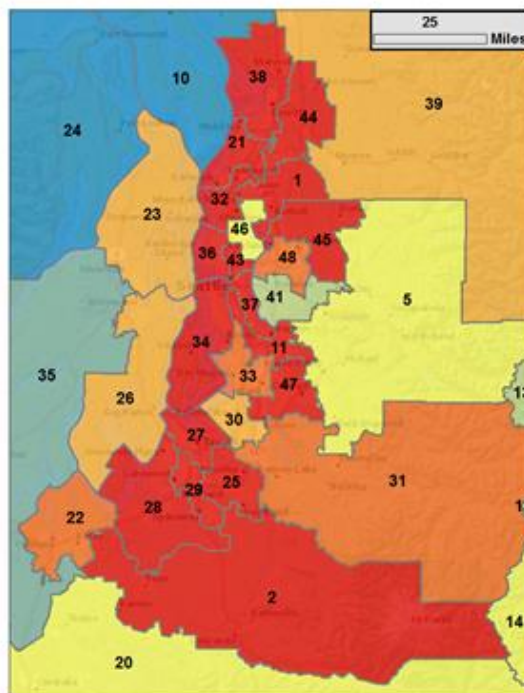
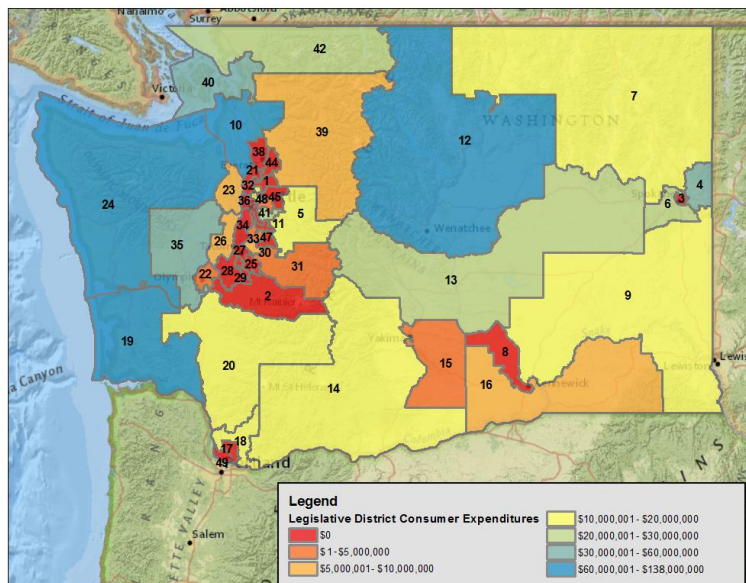
## 2.3 Economic contribution of State Parks at the Legislative District Level

This study identifies expenditures made at state parks within each legislative district.

Unfortunately, IMPLAN data does not adequately model the economic architecture of economies defined by legislative district boundaries, thus an economic contribution analysis at the legislative level was not performed.

Washington State's legislative districts divide the state into 49 relatively equal population units (ranging between 119,000 and 164,000 people).<sup>8</sup> As a result, less population dense regions will have geographically larger areas to capture an adequate representative population. Urban districts, in contrast, are extremely small in comparison. Because many state parks are rural and urban areas contain many legislative districts, there are twenty districts (about 40%) that do not hold state park lands. Ultimately, the legislative district map, Figure 11, shows how state parks disproportionately benefit rural areas all over the state, especially on the Pacific Coast (District 19, 24), the Puget Sound Islands (10, 35, 40, 10), and the North Central Washington State (District 12). Other rural areas attract a significant amount of consumer spending: Districts 7, 9, 14, and 20. A select group of suburban and urban districts also attract significant spending including Districts 5, 11, 18, 41, and 46.

**Figure 11. State Park Expenditures by Legislative District and Magnification of Puget Sound Region**





**Table 6. State Park Visits & Expenditures by Legislative District**

Legislative District	Visits	Total Expenditures*	Legislative District	Visits	Total Expenditures*
1	0	\$0	26	396,991	\$8,666,744
2	0	\$0	27	0	\$0
3	0	\$0	28	0	\$0
4	2,861,041	\$58,447,930	29	0	\$0
5	788,668	\$16,423,040	30	244,641	\$5,318,961
6	982,126	\$20,312,080	31	239,693	\$4,936,949
7	588,427	\$12,976,540	32	0	\$0
8	0	\$0	33	245,490	\$4,937,019
9	529,184	\$11,504,703	34	0	\$0
10	3,967,921	\$85,727,278	35	1,453,230	\$32,794,307
11	0	\$0	36	0	\$0
12	2,421,788	\$61,076,144	37	0	\$0
13	1,127,776	\$28,555,438	38	0	\$0
14	746,076	\$17,730,570	39	439,552	\$9,724,740
15	132,046	\$3,283,914	40	2,100,586	\$48,321,737
16	370,029	\$8,451,645	41	1,486,021	\$29,063,848
17	0	\$0	42	1,233,277	\$28,084,335
18	452,213	\$10,033,535	43	0	\$0
19	5,317,179	\$121,787,062	44	0	\$0
20	534,430	\$13,331,662	45	0	\$0
21	0	\$0	46	637,871	\$12,318,211
22	115,190	\$2,352,885	47	0	\$0
23	318,827	\$6,676,576	48	122,350	\$2,362,755
24	5,995,146	\$137,238,213	49	0	\$0
25	0	-			
			<b>Washington</b>	<b>35,847,770</b>	<b>\$1,523,770,521</b>

\*Legislative districts do not include equipment contribution.



### Riverside State Park

Riverside State Park in Spokane receives almost 1,300,000 visits each year, 99% of which are day visits. This park is an example of a state park being used as a local community park. The park is only a few miles outside of downtown Spokane and many Spokane residents will go to the park to escape the hustle and bustle of the city for a few hours. The park is responsible for \$31

million in total economic contribution within the county every year.

The Spokane House is an interpretive center which tells the story of the local Native American population as well as fur trappers and traders who historically used the site.

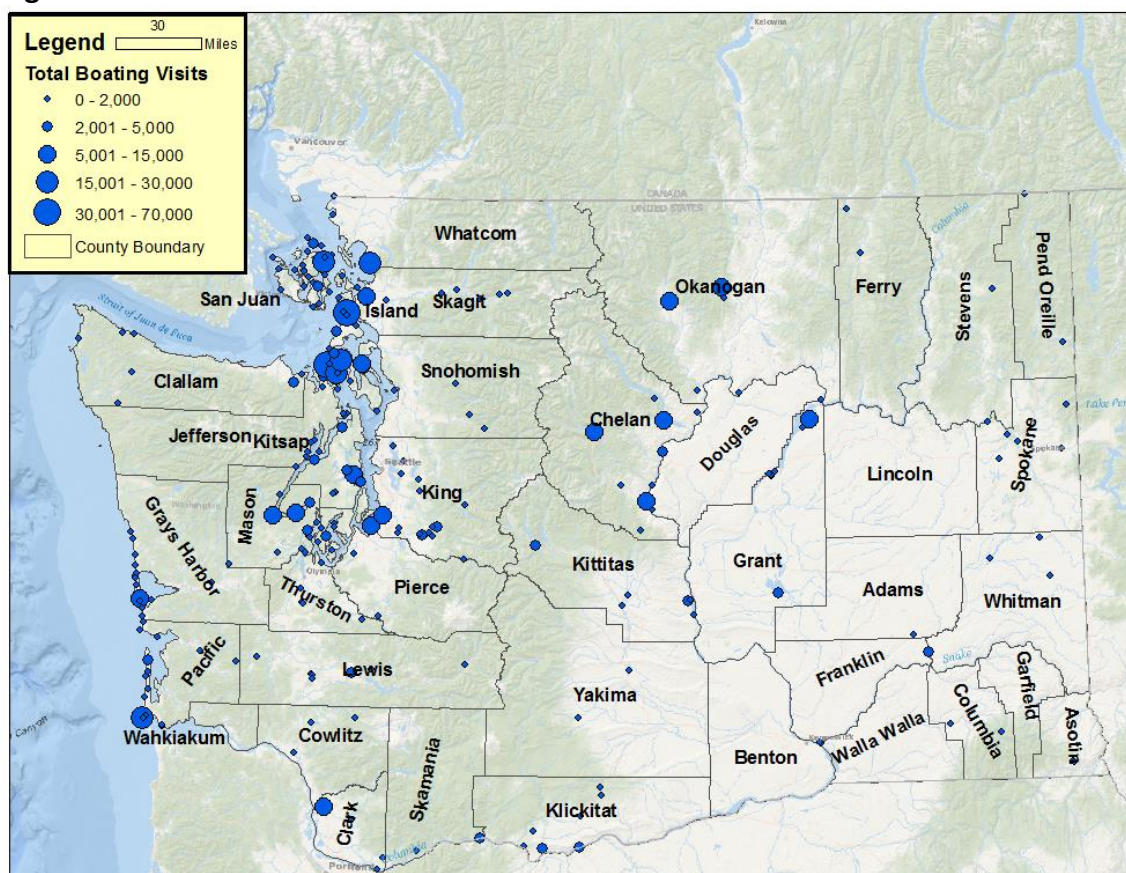




## 2.4 Expenditures and Contributions of Recreation Activities on Waters Associated with State Parks

Washington's state parks encompass a rich tapestry of rivers, lakes, Puget Sound waters, and Pacific Ocean beaches. In fact, other than evergreen forest (59,029 acres), the two largest land cover categories making up state parks are beaches (8,376 acres) and rivers and lakes (7,877 acres). Figure 12 shows the location of all state parks with boat launches. State parks enable an estimated 567,000 water recreation visits a year in Washington State. This number is an estimate based on a set of assumptions explained in section 1.2.1. It is assumed that approximately 3% of park participants are water-related participants in parks that have water access.<sup>16</sup> Participation in water-related recreation varies from park to park, year to year, and region to region and can be impacted by the general economic climate due to the expenses involved.

**Figure 12. Water-Related Recreation Visits at State Parks**



Because of the lack of spatially explicit activity participation data, for waters associated with state parks, boating recreation was used as a proxy for the distribution and relative economic importance of water related activities at state parks. Most water activities that have higher than average spending profiles (fishing, water skiing, scuba diving) involve a boat, specifically a motor

<sup>16</sup> See methods for more details.

boat. Other water related activities, such as swimming, wading, or beach combing, do not have significantly higher expenditure rates than other general outdoor recreation activities<sup>17</sup> and are counted as regular visits.

Usually boating and similar water related recreation is thought of as a very expensive activity, yet this report uses \$30 as an average expenditure rate. According to *California Outdoor Recreation Economic Study*,<sup>h</sup> the average boating party size is 3.7 boaters, which results in a per-party per-day expenditure rate of \$111, as compared to the all participant party sizes of 2.3<sup>i</sup> and per-party per-day expenditures of about \$51. Thus, while boat owners may pay more for their trip-related expenditures, they are often bringing along friends or family who spread those costs on a per-person basis.

Total expenditures resulting from water-related recreation associated with State Park lands is estimated to be nearly \$17 million per year. The largest percentage of expenditures is spent on fuel; both for the boat and for the vehicles associated with boat transport. As seen in Table 7, the state receives \$1.2 million in state taxes each year from outdoor recreation on water associated with state parks. The state also receives sales tax on the purchase of boats and \$25.6 million in watercraft excise taxes in 2013-15 not included in the table below.<sup>j</sup>

**Table 7. Total Economic Contribution of Water-Related Recreation at State Parks**

	Total Expenditures	Total Economic Contribution	Jobs	State Tax
Water-Related Recreation	\$16,788,048	\$20,258,447	166.8	\$1,202,066

Unfortunately, State Parks does not currently measure the participation rates and frequencies of various outdoor recreational activities happening on State Park lands. One would expect given the diversity of state parks' geographies and facilities, that there is tremendous variance in activity participation. Even so, the ratio of activities may change from season to season or with outdoor recreational trends (e.g. stand up paddle boarding in recent years). The Washington State Comprehensive Outdoor Recreation Plan ("SCORP") survey collects data on activity participation rates and frequencies for outdoor recreation in the State at large, but does not allocate this activity spatially. In the *Economic Analysis of Outdoor Recreation in Washington State*, the subset of activities borrowed from SCORP (including fishing, shell fishing, swimming, surfing, rafting boating, tubing) show that all forms of water recreation make up 8.9% of all visits. "Boating" makes up 2.2% of visits for all outdoor recreation. Meanwhile, the projected 67,000 state park water recreation participation days amount to 3% of total statewide visits for motorized boating across all recreation lands.<sup>18</sup>

<sup>17</sup> Appendix D of "Economic Analysis of Outdoor Recreation in Washington State" Earth Economics, 2015.

<sup>18</sup> *Economic Contribution of Outdoor Recreation in Washington State* has total boating days at 19,171,000. With state park boating accounting for 566,923 state parks share of boating is 2.957%.

### Deception Pass State Park

Boasting approximately 77,000-feet of saltwater shoreline, and 33,900-feet of freshwater shoreline, miles of hiking trails and beautiful wildlife viewing attractions, Deception Pass State Park received 2.25 million visits in 2012. The park is situated between Oak Harbor and Anacortes. The park is classified as suburban, but is on the fringe of being rural with a surrounding 25 mile population of 279,074, about 4% of Washington's total population.



Deception Pass' annual visits contribute to almost \$50 million in consumer expenditures each year. These expenditures result in economic contributions in industries like food service and drinking places, retail food and beverage places, recreation industries and 358 other business sectors. The consumer surplus attributed to Deception Pass State Park is nearly \$86 million per year.



## Chapter 3: Consumer Expenditures and Economic Contributions of Outdoor Recreation by Non-Local Participants; Economic Impact of Out-of-State Visitors

The Washington State park system is an engine for the tourism economy and for rural economic development. It attracts \$165 million in expenditures from consumers originating from outside the state boundary, which results in an economic impact of \$20.3 million. The spending of visitors is called an impact and not a contribution because it signifies new money entering the state economy.<sup>19</sup> Meanwhile, non-local participants, most of whom are from Washington State, are estimated to account for 47% of total state park-related expenditures. This means that nearly half of the consumer spending associated with state parks is brought in from outside the regions where state parks are located (more than 50 miles from the park). This transfer of wealth largely occurs from populated urban areas to more rural areas.

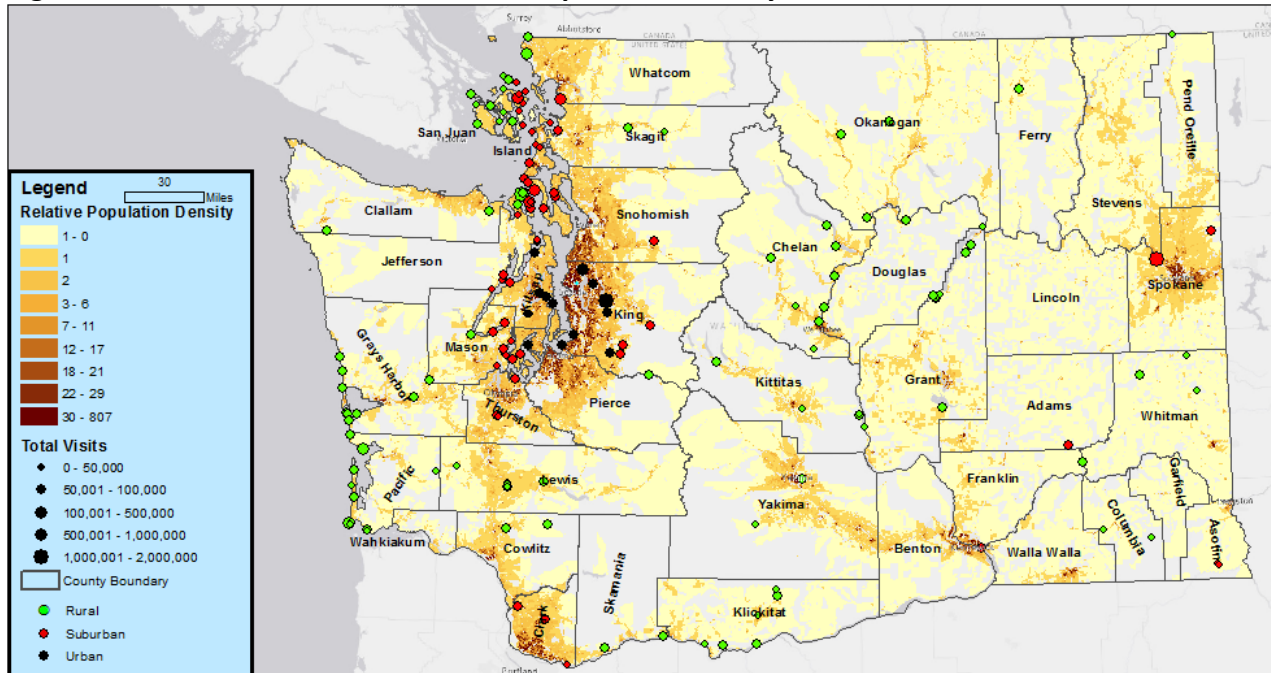
### 3.1 Economic Contribution from Non-Local Participants

In theory, the consumer expenditures made by non-local participants constitute an economic impact as new money is being transferred to the regional economies surrounding state parks. However, there are several data limitations to making this claim, so the economic activity is called a “non-local contribution” throughout the study. IMPLAN models describing county economies do not adequately measure economic activity on a smaller scale.<sup>20</sup> Indeed, the population gradients (see Appendix A), shows that some parks may be more rural or urban, which affects both the expenditure rates of participants as well as the ability of the local economy to absorb the expenditures.

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<sup>19</sup> The correct allocation of economic impact is made in relation to a property, activity, event or infrastructure investment, necessarily involves knowledge of the participants' motivation. Unfortunately such data is not available and if it were, it would vary tremendously from state park to state park, season to season, year to year, and participant to participant. For simplicity and because the visit counts are registered within State Parks, we assume that 100% of state park participant expenditures can be credited to State Parks. Both the percentage of non-local participants and their expenditures rates are relatively conservative compared to other state park studies.

<sup>20</sup> IMPLAN does provide zip code level data, however this would have required a separate analysis for every single park which was outside the scope of this study.

**Figure 13. State Park Classification and Population Density**

Small communities are large beneficiaries of state parks. Regardless of any definitions of rural, suburban, or urban, one can observe that the majority of state parks are located in areas of low population density, representing small communities. Thus, the State Parks system is highly skewed to location in areas of low population. As seen in Table 1 in the methodology section, 56.7% of parks<sup>21</sup> are rural and attract nearly half of all state park participants.<sup>22</sup> For more validation on state parks urban and rural designation, see Appendix A.

Although non-local participants make up only a third of all visits, they make up nearly half of expenditures, as seen in Table 8. Because state parks attract participants and facilitate participant travel throughout Washington State by providing camping and boat access, they are meaningful assets for the outdoor recreation economy. Non-local participants and out-of-state visitors are not only likely to spend more while traveling to state parks, they are also more likely to stay longer, and spend more money at local shops and restaurants resulting in an increase in wealth in these communities.

**Table 8: Local versus Non-Local Visits and Expenditures**

Local		Non-Local		Total	
Visits	Expenditures	Visits	Expenditures	Visits	Expenditures
24,281,221	\$422,167,919	11,566,549	\$380,330,722	35,847,770	\$802,498,641

<sup>21</sup> Considers 181 State Park lands with provided visit counts.

<sup>22</sup> 8.3% of parks are classified as urban, 35% as suburban.

### 3.2 Economic Impact from Out-of-State Visitors

Not only do many attractive features of state parks draw visitors from outside of Washington, but they also facilitate out-of-state visitor travel and appreciation of other Washington State travel attractions, notably the National Parks, Puget Sound, and Coast. Along Washington State's borders, state parks can provide local recreation options for neighboring states and Canada, especially in the San Juan Islands, near Portland, along the Columbia River, or in Spokane County next to Idaho. In each of these cases, state parks are to some degree responsible for attracting the consumer expenditures of out-of-state visitors, or "new money," which would not normally have been spent within Washington State.

Out-of-state visitors to state parks spend approximately \$165 million each year and have an annual aggregate economic impact of over \$200 million (see Table 9). For every dollar that is spent, \$1.22 is circulated within the state. Although out-of-state visitors represent only 10% of total visits, they drive 20.5% of the consumer expenditures.<sup>23</sup>

**Table 9. Total Impact of Out-of-State-Visitors to State Parks**

Category	Total Impact
Expenditures*	\$165,125,944
	
Leakage	\$49,779,010
Direct Economic Impact	\$115,346,934
Indirect Economic Impact	\$37,375,220
Induced Economic Impact	\$48,018,981
Total Economic Impact	\$200,741,136

\*Does not include equipment expenditures

Expenditures in accommodation and service industries tend to trickle down to the local economy more than expenditures on other sectors such as retail stores. Food services and drinking places are the largest sector benefitting from expenditures by out-of-state visitors (see Table 10). The impact analysis highlights the importance of promoting outdoor recreation in Washington beyond state borders.

<sup>23</sup> The estimate that 10% of park visitors are from out of state is based on findings from other state park studies and based on data collected by The Commission, showing that 11.4% of campers originate from out-of-state.



**Table 10. Total Impact of Out-of-State-Visitors by Top Industry**

Industry	Total Impact
Food services and drinking places	\$25,249,289
Wholesale trade businesses	\$20,164,526
Petroleum refineries	\$15,473,558
Retail Stores - Food and beverage	\$13,456,876
General and consumer goods rental except video tapes and discs	\$10,843,871
Retail Stores - Gasoline stations	\$9,197,898
Hotels and motels, including casino hotels	\$8,952,092

Table 11 shows some general categories of state and local taxes receiving revenue from the observed expenditures. Taxes on production and imports represent the largest area of tax revenue. These taxes emerge largely from the sale of goods and services at retail places. Total state and local tax impacts from out-of-state visitors currently stand at \$13 million.

**Table 11. Total Tax Contributions of Out-of-State-Visitors**

Tax Category	Total
Employee Compensation	\$116,362
Proprietor Income	\$0
Tax on Production and Imports	\$12,515,029
Households	\$318,348
Corporations	\$9,154
Total	\$12,958,893

### Birch Bay State Park

Birch Bay State Park is situated just 9 miles south of the Canadian border in Blaine, WA and receives 800,000 visits each year and contributes to \$18.5 million in spending. It is estimated that 38% of the visits are non-local in origin, though the actual number of non-local campers may be much higher. The park offers many attractions such as boating, clamming, crabbing, fishing, camping and hiking.



## Chapter 4: Non-Market Economic Benefits of Recreation in State Parks

The benefits provided by the Washington State Park system include more than expenditures and the economic activity that these generate. The total value provided by state parks would include the value gained by recreation participants beyond expenditures, or the recreational consumer surplus, as well as the ecosystem services provided by the lands and waters within state park boundaries and enjoyed by communities nearby. These services amount to significant non-market benefits to Washington State and are estimated to be about \$1.9 to \$2.5 billion in additional annual value received outside markets. Of this total, \$1.4 billion are annual recreational consumer surplus and \$500 million to \$1.2 billion of which are annual ecosystem co-benefits provided by State Park's lands. These numbers do not include the mental and physical health benefits nor do they include the social benefits derived from outdoor recreation in Washington's state parks.

### 4.1 Introduction to Non-Market Benefits

Qualitatively, state parks play an important role in providing a better quality of life and environmental improvements to local communities. Although it has been conventionally difficult to measure such intangibles and externalities in the past, consumer surplus and ecosystem service valuation methods have been, with increasing accuracy and defensibility, able to quantify these non-market benefits. One measure of positive externalities, or impacts that happen outside markets, is referred to as "consumer surplus" by economists. The average state park visit provides \$38 in consumer surplus, or in other words, the average state park participant would be willing to pay an additional \$38 for their experience beyond the expenditures they are already incurring (which averages \$22.39 per visit). Therefore the value that recreation participants place on their experience exceeds the \$10 needed for a one time entry, the \$30 annual fee for a Discover Pass, the boat launching fees paid, or the average of \$22.39 in per visit consumer expenditures.

The State Park system, with just three ecosystem services analyzed,<sup>24</sup> provides between \$500 million and \$1.2 billion in non-market benefits per year.<sup>25</sup> Ecosystem services are defined as the benefits people derive from nature, free of charge. Breathable air, drinkable water, nourishing food, waste treatment, flood risk reduction, and stable atmospheric conditions are some examples. These benefits are conventionally not accounted for in accounting or economic contribution/impact analyses. In reality, ecosystem services create irreplaceable value and can amount to high cost savings and increased economic value to the state and the communities around state parks.<sup>k</sup> In order to show their economic importance, ecosystem services can be

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<sup>24</sup> Earth Economics has developed a taxonomy of 21 ecosystem services, though only three were studied here.

<sup>25</sup> The range of values reflects different contexts and factors that influence the value attributed to a given type of ecosystem. The range reflects the uncertainty inherent to the benefit transfer methodology.

valued in dollar units. In many cases these values reflect avoided costs, inputs into economic production processes, or into potentially marketable goods and services. Economists have developed a number of methods to translate ecosystem services into monetary values. A list of the most common valuation methodologies is provided in Appendix B.

In the absence of primary data for a site-specific valuation, values obtained from already published studies of sufficiently similar sites can be used as general approximations. This valuation methodology is referred to as benefit transfer. It is commonly applied in policy analysis, as decision makers require timely and cost-effective methods for valuing green spaces.

## 4.2 Consumer Surplus of Recreation as an Ecosystem Service

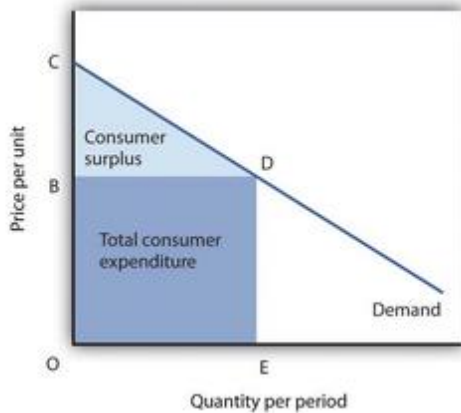
In this study, consumer surplus for state parks' visits were estimated from a recreation value database developed by Dr. Randall Rosenberger, Professor of Environmental Economics at Oregon State University.<sup>1</sup> For more information on how consumer surplus is calculated, see Box 2. The average consumer surplus from visiting a state park in Western United States was found to be \$38.30 (2015 USD). This value was applied to all yearly visits to state parks in Washington, which resulted in a total of \$1.4 billion in annual consumer surplus (see Table 12 for county and state level results). The actual value received from outdoor recreation in state parks is therefore much greater than the recorded economic transactions estimated through the economic contribution and economic impact analyses.

**Table 12. Consumer Surplus of Yearly Visits to Washington State Parks by County**

County	Total Visits Per Year	Consumer Surplus Per Year 2015 USD	County	Total Visits Per Year	Consumer Surplus Per Year 2015 USD
ADAMS	248,048	\$9,501,212	LEWIS	258,691	\$9,908,862
ASOTIN	50,555	\$1,936,455	LINCOLN	0	-
BENTON	0	-	MASON	998,793	\$38,257,693
CHELAN	1,150,409	\$44,065,182	OKANOGAN	733,548	\$28,097,769
CLALLAM	196,595	\$7,530,360	PACIFIC	3,887,381	\$148,901,936
CLARK	452,213	\$17,321,533	PEND OREILLE	4,911	\$188,111
COLUMBIA	50,303	\$1,926,802	PIERCE	226,420	\$8,672,775
COWLITZ	182,272	\$6,981,733	SAN JUAN	1,339,086	\$51,292,251
DOUGLAS	75,410	\$2,888,499	SKAGIT	413,400	\$15,834,843
FERRY	62,698	\$2,401,580	SKAMANIA	342,702	\$13,126,832
FRANKLIN	163,190	\$6,250,818	SNOHOMISH	290,502	\$11,127,367
GARFIELD	0	-	SPOKANE	4,170,005	\$159,727,564
GRANT	1,418,420	\$54,331,055	STEVENS	0	-
GRAYS HARBOR	4,724,177	\$180,954,528	THURSTON	441,781	\$16,921,947
ISLAND	4,209,426	\$161,237,543	WAHKIAKUM	0	-
JEFFERSON	2,478,093	\$94,920,692	WALLA WALLA	0	-
KING	3,748,142	\$143,568,555	WHATCOM	1,738,752	\$66,601,028
KITSAP	749,202	\$28,697,378	WHITMAN	141,469	\$5,418,818
KITTITAS	365,757	\$14,009,929	YAKIMA	136,949	\$5,245,694
Klickitat	398,471	\$15,263,004	<b>WASHINGTON</b>	<b>35,847,770</b>	<b>\$1,373,110,340</b>

**Box 2. What is Consumer Surplus?**

Consumer surplus is the difference between the maximum price consumers would be willing to pay for a good or service and what they actually pay for it (see Figure 14). This difference is a gain for the consumer since they are paying less than the value they place on that benefit. For example, a Washingtonian may be willing to pay \$50 to go hiking for one day on the Olympic Peninsula (this would be point C in Figure 14). If the actual cost of the hiking trip is only \$20 (point D), then the hiker gains a net economic benefit (consumer surplus) of \$30 per day (or the area of the triangle BCD). Even though they are obtained free of charge, the existence of extra benefits is strategic in the decision to visit an attraction or engage in an activity.

**Figure 14. Consumer Surplus versus Consumer Expenditures****4.3 Ecosystem Services provided by State Park Lands**

Three ecosystem services provided by the state park ecosystems were valued for the non-market economic benefits they provide local and non-local communities. These benefits accrue outside the transactions and experiences associated with recreational activity. In addition to the services valued in this report, state park lands may also provide important storm water, flood, or fire buffers to communities. Many other ecosystem services are provided by the natural lands preserved by State Parks (see Appendix B). However, only three services were valued in this report.

**Aesthetic Information**

Aesthetic Information is defined as enjoying the sights, sounds, smells, and presence of nature. This ecosystem service is often valued through the environmental attributes of property sales and hence reflects the added housing value to those who live close to outdoor recreational areas. Properties located on the edge of a lake are often more expensive than non-lakeside properties

in the same area. For example, one half of the respondents to a National Association of Realtors survey reported they would pay 10% more for a house located near a park or open space, while the actual premium paid for homes directly adjacent to parks is 16% higher. <sup>m</sup>

### Wildlife Habitat

Recreational activities like wildlife viewing or hunting would not exist without the ecosystem service of habitat and nursery. Beyond recreation, however, ecosystems within state parks also provide safe havens for endangered species and other species important in food webs and in other ecological functions. In some cases, people value the existence of wildlife as an end in itself (intrinsic value of wildlife). There are many methods for valuing habitat. It can be valued as a factor of production (e.g. inputs to crops or maintenance of fish populations) or through willingness to pay surveys for specific species. It should also be noted that “wildlife viewing” was the most lucrative outdoor recreation activity in Washington State.<sup>c</sup>

### Water Quality

Many state parks have rivers, lakes, and watersheds within them. The vegetated landscape around these water bodies plays an important function in improving or maintaining water quality, which eventually affects downstream users as well. Forest and grassland vegetation along river banks stabilize soils and prevent erosion, reducing sediment run-off. Vegetation, microbes, and soils remove pollutants and sediment from the water by adhering to contaminants, by reducing water speed to enhance infiltration, by biochemical transformation of nutrients and contaminants, by absorbing water and nutrients from the root zone of trees, by stabilizing eroding banks, and by diluting contaminated water.<sup>n</sup> Some species, like shellfish, are able to provide clean water by removing pollutants and sediment from the water. It can be said that natural lands filter and control the flow of water in lieu of built infrastructure like water purification facilities, levies, and storm water systems. The cost of replacing these functions with built infrastructure, or replacement value, is one way to value water quality.

In order to estimate the economic value of these three co-benefits being produced by state parks, a benefit transfer methodology was used. Earth Economics' computational engine and valuation database, the Ecosystem Valuation Toolkit (EVT), has a large number of primary valuation studies for Washington State and other Western States with similar climatic and geographical conditions. In order to conduct the valuation, GIS was used to determine the number of acres of different land cover types within state parks across Washington State (see Table 13). These ecosystems, or land covers, were categorized using the National Land Cover Dataset (NLCD).<sup>o</sup> For each land cover type a set of suitable values were chosen for the selected ecosystem services that exist within them. The unit of valuation used is 2015 USD per acre per

year and a range of values is provided to reflect differences found in existing studies.<sup>26</sup> The total annual economic value of the three ecosystem services provided by State Parks' lands range between \$500 million and \$1.2 billion.

**Table 13. Aesthetic, Wildlife Habitat, and Water Quality Value Provided by State Parks' Ecosystems** (Table revised 9/9/2015)

NLCD	Acres	Annual Low (\$/acre/year)	Annual High (\$/acre/year)	Total Low (\$/year)	Total High (\$/year)
Developed, Open Space	3,434	\$484	\$3,020	\$1,662,056	\$10,370,680
Deciduous Forest	2,912	\$6,036	\$12,116	\$17,576,832	\$35,281,792
Evergreen Forest	59,029	\$6,365	\$12,451	\$375,719,585	\$734,970,079
Mixed Forest	7,737	\$5,551	\$11,630	\$42,948,087	\$89,981,310
Grassland/Herbaceous	5,106	\$8,031	\$12,764	\$41,006,286	\$65,172,984
Pasture/Hay	840	\$5	\$15	\$4,200	\$12,600
Cultivated Crops	1,143	\$9,776	\$20,066	\$11,173,968	\$22,935,438
Woody Wetlands	3,853	\$534	\$33,297	\$2,057,502	\$128,293,341
Emergent Herbaceous Wetlands	2,544	\$946	\$20,926	\$2,406,624	\$53,235,744
Rivers and Lakes	7877	\$258	\$579	\$2,032,266	\$4,560,783
Shrub/Scrub	30,901	\$258	\$550	\$7,972,458	\$16,995,550
Beaches	8,376	\$253	\$667	\$2,119,128	\$5,586,792
<b>Total</b>	<b>133,752</b>	<b>\$3788</b>	<b>\$8728</b>	<b>\$506,678,992</b>	<b>\$1,167,397,093</b>

\*Marine waters were not included as a land cover type; excludes 4,166 'miscellaneous' land to total 137,918 acres for park system. –adjusted

Many people stand to benefit from the conservation of land as a state park. Beyond the ecosystem services values in this report, the conservation of green spaces also results in reductions in flood risks, cleaner air, climate regulation, carbon sequestration, greater biodiversity, pollination services, scientific and education opportunities, and more (see Appendix B).

<sup>26</sup> The range of values reflects different contexts and factors that influence the value attributed to a given type of ecosystem. The range reflects the uncertainty inherent to the benefit transfer methodology.



## Chapter 5. Conclusions and Further Research

The first part of this report quantified and allocated the significant market-based economic benefits resulting from recreational activities within state parks including consumer expenditures, economic contributions, economic impacts, taxes collected, and jobs. State parks promote consumer expenditures in sectors that provide significant employment to Washington State residents and appreciable tax revenue to the state general fund.

The state park system is an engine for rural economies and redistributes wealth to rural regions by attracting significant spending from non-local participants. State parks facilitate tourism by providing critical outdoor recreation assets and also attract new money from out-of-state visitors. State parks are especially important in areas that lack other kinds of public conservation land or critical recreational amenities such as Salish Sea Islands and the Pacific Coast.

The second part of this report quantifies some of the non-market benefits of the Washington State park system. Indeed, state parks provide an aggregate consumer surplus that nearly matches the aggregate value of equipment and activity-related consumer expenditures. The lands and waters from which state parks are composed provide numerous and essential ecosystem services to local and non-local beneficiary populations outside those that interface with state parks as outdoor recreation participants. Whether storm water management, a driver for real estate value, or wildlife habitat, state parks provide more value than the consumer expenditures they help generate and the recreational experiences they provide.

The results of this report can be used to inform State Park policy on maintenance budgeting, asset management, and investments on a state level. The regional results provide a means for teasing out regional and park-specific comparative advantages and value-propositions. These numbers also provide a reference for scale to understand the niches that state parks fill in the outdoor recreation economy as well as their state-wide, overall importance.

Suggestions for further areas of study include the physical and mental health benefits associated with state park-related outdoor recreation as well as the social capital benefits provided by outdoor recreation participation, events, and conferences.

## Endnotes

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<sup>a</sup> "Seattle Seahawks." Forbes. Forbes Magazine, Web. 05 July 2015.

<sup>b</sup> "Why Does Popcorn at the Movies Cost so Much?" Why Does Popcorn at the Movies Cost so Much? Web. 13 July 2015.

<sup>c</sup> Economic Impacts of Visitors to Washington State Parks, Dean Runyan 2002

<sup>d</sup> Briceno, T., Schundler, G. 2015. Economic Analysis of Outdoor Recreation in Washington State. Earth Economics, Tacoma, WA.

<sup>e</sup> Department of Commerce. 2013. Petroleum Supply and Use in Washington State: An overview of recent developments in the petroleum market. <http://www.commerce.wa.gov/documents/petroleum-whitepaper-7-15-2013.pdf>

<sup>f</sup> "Key Studies: Why Local Matters." Institute for Local Self Reliance. Web. 08 July 2015.

<sup>g</sup> <http://data.spokesman.com/census/2010/washington/legislative-districts/>

<sup>h</sup> California State Parks/BBC Research & Consulting, 2011. California Outdoor Recreation Economic Study: Statewide Contributions and Benefits. <http://www.parks.ca.gov/pages/795/files/ca%20outdoor%20rec%20econ%20study-statewide%2011-10-11%20for%20posting.pdf>

<sup>i</sup> Stynes, D., White, E. Spending Profiles of National Forest Visitors, NVUM Four Year Report, East Lansing, MI. Available online at <http://www.fs.fed.us/recreation/programs/nvum/NVUM4YrSpending.pdf>

<sup>j</sup> A. Legislative Guide, Washington State's, and Tax Structure. "A LEGISLATIVE GUIDE TO WASHINGTON STATE'S TAX STRUCTURE." (n.d.): n. pag. Web. 2 July 2015

<sup>k</sup> Schrier, A. V., Bronfin, J., Harrison-Cox, J. 2013. What is your planet worth? A handbook for understanding natural capital. Earth Economics. Tacoma, WA.

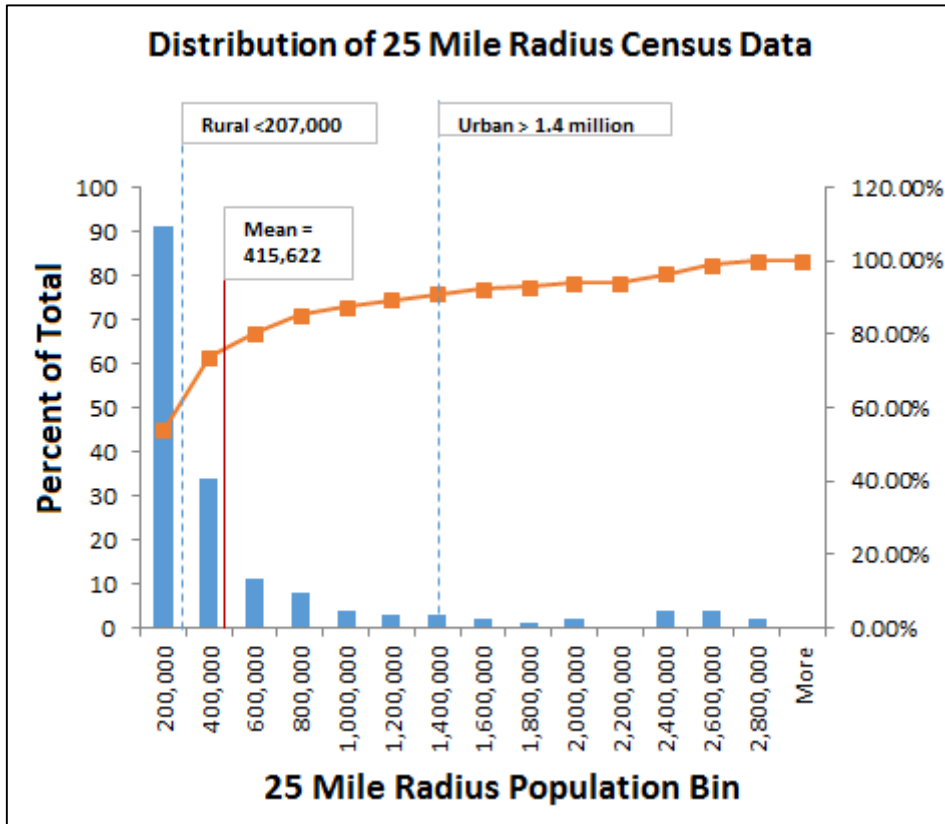
<sup>l</sup> Rosenberger, R.S. 2011. Recreation Use Values Database. Oregon State University, Corvallis, OR. Available online at <http://recvaluation.forestry.oregonstate.edu/database>.

<sup>m</sup> Tassel, Sandra "Making the Most of Our Money: Recommendations for State Conservation Programs" Look at the Land, Inc., Nature Conservancy, and The Trust for Public Land.

<sup>n</sup> Brauman, K.A., G.C. Daily, T.K. Duarte, and H.A. Mooney. 2007. The nature and value of ecosystem services: an overview highlighting hydrologic services. Annual Review of Environment and Resources.

<sup>o</sup> Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, Completion of the 2011 National Land Cover Database for the conterminous United States-Representing a decade of land cover change information. Photogrammetric Engineering and Remote Sensing, v. 81, no. 5, p. 345-354

## Appendix A: Assumptions for Urban, Suburban and Rural Parks



For this study, GIS was employed by “clipping” US Census 2010 Block data for population with a 25 mile radius circle around the centroid of each state park. The mean was then derived of these 25 mile radius population counts: 415,622. Because the dataset was highly skewed to rural, the standard deviation of 634,995 was not suitable for bell curve distribution analytics. As a result we analyzed the distribution curve of state park 25 mile population and created two thresholds between rural and suburban and suburban and urban. The resulting division of parks and total participants into these categories can be seen in Table 14.

**Table 14. Summary of Urban-Rural Designation**

	25 Mile Radius Population Range	Local %	Non Local %	Number of Parks	Total Participants Data
Urban	>1.4 million	79%	21%	15 (8.3%)	3,685,815 (10.3%)
Suburban	1.4 million to 207,000	72%	28%	63 (35%)	14,290,146 (39.9%)
Rural	<207,000	62%	38%	103 (56.7%)	17,871,809 (49.8%)
Total	N/A	68%	32%	181	35,847,770
Dean Runyan (2002)	All Parks	64%	36%		

A spectrum of local and non-local participant ratios along an urban to rural gradient is confirmed by primary data collected on participant origin for a New York State Park study. On the extreme urban side of the spectrum New York State recorded “non-local visitors” at 2.9% of total State Park participants in New York City and 37.8% for the Niagara Frontier. Relative urban density varies from era to era, nation to nation, and region to region, therefore we did not transfer these values directly. The range of ratios we chose was a more conservative range of non-local participants with 21% for urban parks, 28% for suburban, and 38% for rural parks. Regardless of the designation, these parks still have a majority of local participants. For guidance we benchmarked this assumption against Dean Runyan’s assertion that 64% of 2002 State Park Visitors were local day visitors.

TABLE 7. SHARE OF NON-LOCAL VISITORS AND ESTIMATED TOTAL NON-LOCAL VISITOR EXPENDITURES BY REGION

	non-local visitors (percent)	non-local visitor expenditures (\$ millions)	
		low	high
Allegany	18.20%	\$12.20	\$25.20
Capital/Saratoga	36.20%	\$40.60	\$83.60
Central	32.40%	\$25.90	\$53.30
Finger Lakes	31.70%	\$31.80	\$65.60
Genesee	20.80%	\$8.70	\$18.00
Long Island	9.50%	\$64.20	\$132.20
New York City	2.90%	\$4.50	\$9.20
Niagara Frontier	37.80%	\$132.40	\$272.70
Palisades	6.80%	\$10.20	\$20.90
Taconic	12.20%	\$12.90	\$26.50
Thousand Islands	21.40%	\$12.50	\$25.70
state	18.50%	\$356	\$733

source: non-local visitors, OPRHP; expenditures, see text

### Figure 15: Non-Local Participants (“Visitors”) by Survey in NY State

## Appendix B Ecosystem Services and Valuation Methodologies

**Table 15. Typology for 21 Ecosystem Services**

Good/Service	Economic Benefit to People
<b>Provisioning Services</b>	
Food	Producing crops, fish, game, and fruits
Medicinal Resources	Providing traditional medicines, pharmaceuticals, and assay organisms
Ornamental Resources	Providing resources for clothing, jewelry, handicraft, worship, and decoration
Energy and Raw Materials	Providing fuel, fiber, fertilizer, minerals, and energy
Water Supply	Provisioning of surface and groundwater for drinking water, irrigation, and industrial use
<b>Regulating Services</b>	
Biological Control	Providing pest and disease control
Climate Stability	Supporting a stable climate at global and local levels through carbon sequestration and other processes
Air Quality	Providing clean, breathable air
Moderation of Extreme Events	Preventing and mitigating natural hazards such as floods, hurricanes, fires, and droughts
Pollination	Pollination of wild and domestic plant species
Soil Formation	Creating soils for agricultural and ecosystems integrity; maintenance of soil fertility
Soil Retention	Retaining arable land, slope stability, and coastal integrity
Waste Treatment	Improving soil, water, and air quality by decomposing human and animal waste and removing pollutants
Water Regulation	Providing natural irrigation, drainage, groundwater recharge, river flows, and navigation
<b>Supporting Services</b>	
Habitat and Nursery	Maintaining genetic and biological diversity, the basis for most other ecosystem functions; promoting growth of commercially harvested species
Genetic Resources	Improving crop and livestock resistance to pathogens and pests
<b>Cultural Services</b>	
Natural Beauty	Enjoying and appreciating the presence, scenery, sounds, and smells of nature
Cultural and Artistic Inspiration	Using nature as motifs in art, film, folklore, books, cultural symbols, architecture, and media
Recreation and Tourism	Experiencing the natural world and enjoying outdoor activities
Science and Education	Using natural systems for education and scientific research
Spiritual and Historical	Using nature for religious and spiritual purposes

**Source:** Adapted from de Groot puc., 2002 and Sukhdev et al., 2010

**Table 16. Primary Ecosystem Service Valuation Methods**

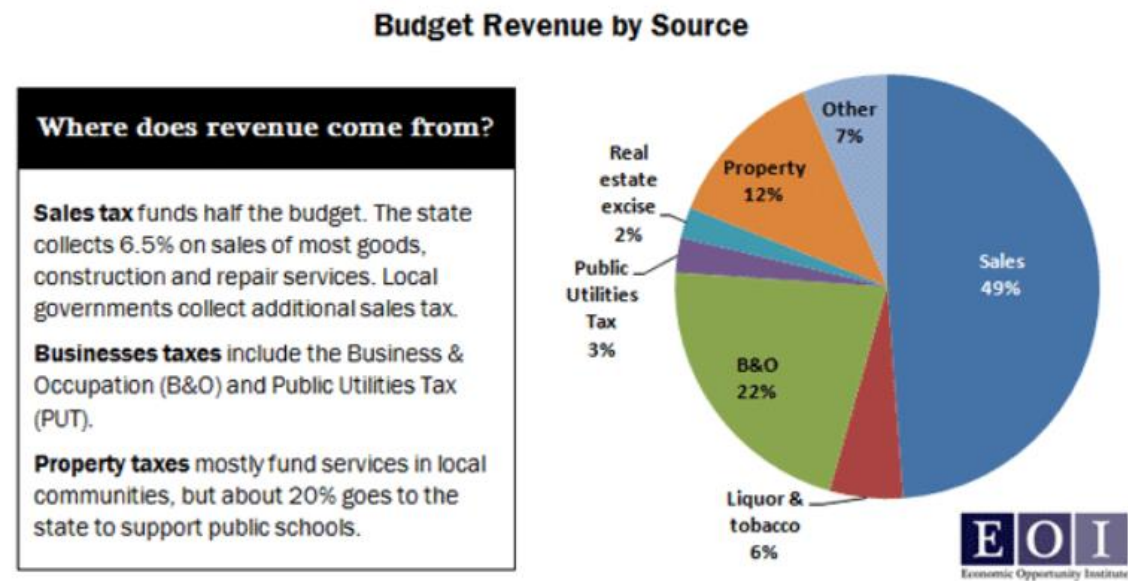
<b>Market Value</b>	The value that an ecosystem good is sold for in a market.
<b>Avoided Cost (AC)</b>	The value of costs avoided that would have been incurred in the absence of particular ecosystem services. Example: The hurricane protection that is provided by barrier islands avoids property damages along coastlines.
<b>Replacement Cost (RC)</b>	The cost of replacing ecosystem services with man-made systems. Example: Natural water filtration is replaced with a costly man-made filtration plant.
<b>Factor Income (FI)</b>	The enhancement of income by ecosystem service provision. Example: Water quality improvements increase commercial fisheries catch and thereby also the incomes of fishermen.
<b>Travel Cost (TC)</b>	The cost of travel required to consume or enjoy ecosystem services. Travel costs can reflect the implied value of the service. Example: Recreational areas attract tourists. The value they place on that area must, at a minimum, be at least the price they were willing to pay to travel to it.
<b>Hedonic Pricing (HP)</b>	The reflection of service demand in the varying prices people will pay for associated goods. Example: Housing prices of properties in close proximity to recreational areas can be higher than those that are farther from these areas.
<b>Contingent Valuation (CV)</b>	The value for service demand elicited by posing hypothetical scenarios that involve some valuation of land use alternatives. Example: People would be willing to pay for increased wetland restoration, as expressed through surveys.
<b>Group Valuation (GV)</b>	Discourse-based contingent valuation, which is conducted by bringing together a group of stakeholders to discuss values in order to determine society's willingness to pay. Example: Government, citizen's groups, and businesses come together to determine the value of an area and the services it provides.



Appendix C Washington State Budget Revenue

2011-13 General Fund Budget for Washington State was \$31 billion

Figure 16. Washington State Budget Revenue by Source



"An Introduction to the WA State Budget: The General Fund and Sources of Revenue." Economic Opportunity Institute, 10 Jan. 2012. Web. 07 July 2015