



WILLAMETTE FALLS WHITEWATER PARK

A PROSPECTIVE ECONOMIC ANALYSIS

April 2015

PREPARED BY:

ECONorthwest
ECONOMICS • FINANCE • PLANNING

ACKNOWLEDGMENTS

ECONorthwest prepared this report for We Love Clean Rivers Inc. with development grant funding from Clackamas County Tourism and Cultural Affairs and building from work funded, in part, by Portland General Electric.

For over 40 years ECONorthwest has helped its clients make sound decisions based on rigorous economic, planning, and financial analysis. For more information about ECONorthwest: www.econw.com. The primary ECONorthwest contributors to this report were Mark Buckley, Will Provost, Austin Rempel, and Joel Ainsworth, with input from Lorelei Juntunen, Terry Moore, and Ed MacMullan. ECONorthwest received substantial assistance from S20 Designs and particularly Scott Shipley as well as Sam Drevo, Kate Govaars, Julie Maher, Holly Heiberg, Travis Kruger and Carl Poston from We Love Clean Rivers. Steve Lisac, Mark Gamba, Tom Decuir, David Johnson, Luke Spencer, Victor Myers, Jack Hodge, and several others provided valuable input as well.

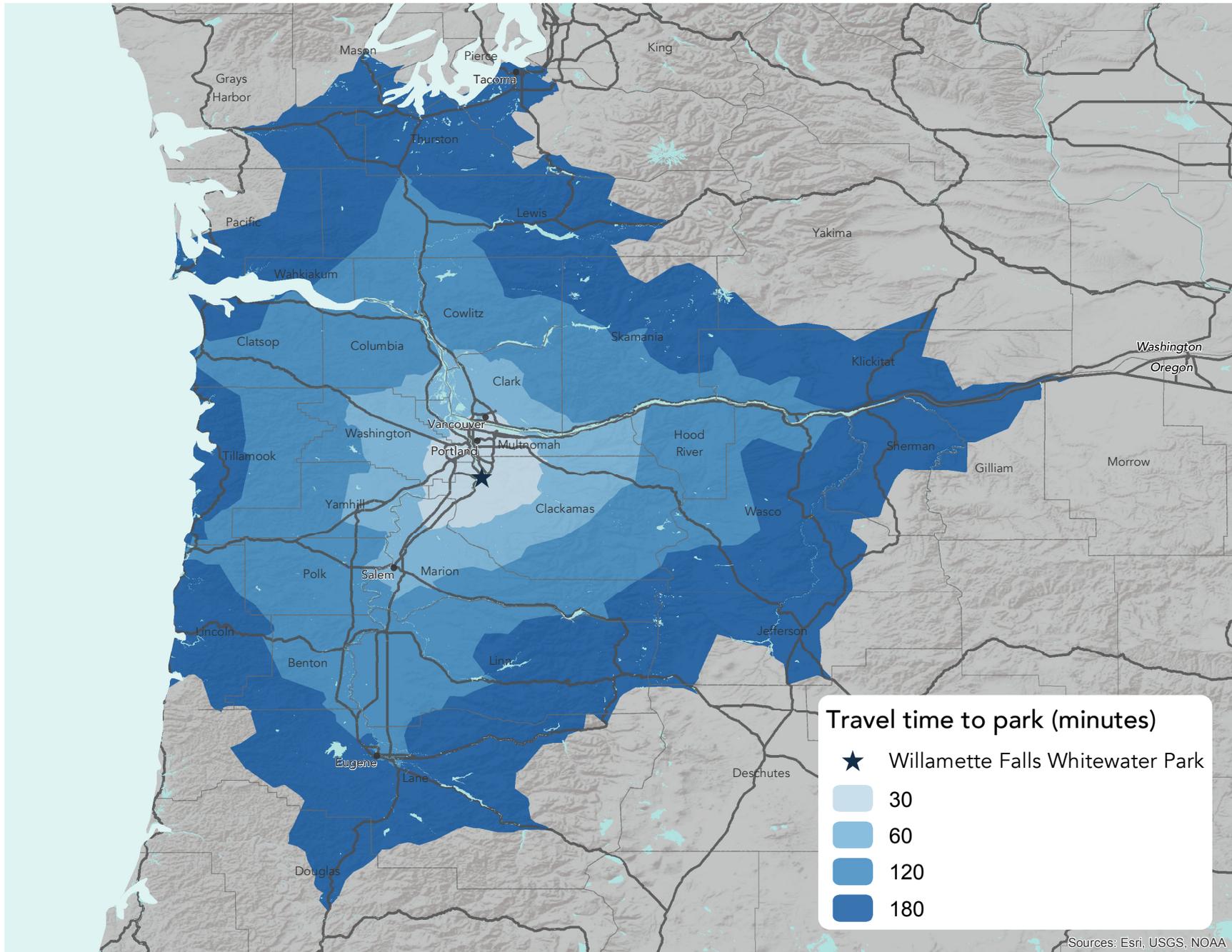
That assistance notwithstanding, ECONorthwest is responsible for the content of this report. The staff at ECONorthwest prepared this report based on their general knowledge of microeconomics, economic conditions in the Portland Metro region, outdoor recreation, the Willamette Falls planning process, and on information derived from government agencies, private statistical services, the reports of others, interviews of individuals, or other sources believed to be reliable. ECONorthwest has not independently verified the accuracy of all such information, and makes no representation regarding its accuracy or completeness. Any statements nonfactual in nature constitute the authors' current opinions, which may change as more information becomes available.

For more information about this report:

Mark Buckley
buckley@econw.com
KOIN Center
222 SW Columbia Street
Suite 1600
Portland, OR 97201
503.222.6060

TABLE OF CONTENTS

1	Executive Summary
2	Introduction
7	Whitewater Parks and Usage
12	Estimating Willamette Falls Activity
21	Economic Impacts
24	Other Potential Unquantified Benefits
25	Conclusion
26	Bibliography



EXECUTIVE SUMMARY

Willamette Falls, in the Portland Metro region near Oregon City, is undergoing a redevelopment process that could potentially incorporate a whitewater park. Communities across the country and overseas are finding benefits to residents and visitors from this trend in urban outdoor recreation. Willamette Falls has all of the fundamental characteristics necessary for a successful whitewater park. The Willamette River at Willamette Falls has ample **streamflow** at all times of year, considerable **gradient** for any type of whitewater park, and **high demand** based on regional factors compared to existing whitewater parks. A whitewater park at Willamette Falls is likely compatible with the overall objectives of the Willamette Falls Legacy Project of public access, habitat restoration, historic significance, and economic development. A successful whitewater park could provide a profitable attraction that reinforces the brand of Oregon City and the region as a whole.

This analysis examines the economic benefits and market impacts under two possible scenarios: 1) **a small whitewater play park** and 2) **a large whitewater center**. The whitewater center concept expands on the small park with increased opportunities for commercial rafting and large-scale spectating, including races and events. These analyses found the potential annually for several million dollars worth of expenditures and net benefit to participants and spectators at this site.

SCENARIO 1: WHITEWATER PLAY PARK

	Activity	Users	Consumer Surplus	Expenditures	
				Local	Overnight (25%)
Events	Kayaking/Rafting/ Canoeing	1,500	\$189,696	\$69,785	\$67,555
	Tubing	0	\$0	\$0	\$0
	Surfing/SUP	150	\$18,970	\$6,979	\$6,756
	Spectators	15,000	\$692,537	\$190,074	\$260,680
Annual Totals (Event and Non-Event)	Kayaking/Rafting/ Canoeing	10,998	\$1,390,812	\$511,650	\$495,301
	Tubing	2,892	\$365,677	\$134,525	\$130,226
	Surfing/SUP	6,574	\$831,345	\$305,834	\$296,061
	Spectators	20,463	\$944,761	\$259,300	\$355,620
Totals	Participants	22,113	\$2,796,500	\$1,028,772	\$995,899
	All Users	57,576	\$4,433,798	\$1,478,146	\$1,612,198

SCENARIO 2: WHITEWATER CENTER

Activity	User Days	Net Economic Benefit	Expenditures	
			Local	Overnight (25%)
Private Users	22,113	\$2,796,500	\$1,028,772	\$995,899
Commercial Rafters	120,259	\$15,208,454	\$5,594,863	\$5,416,088
Spectators	239,628	\$11,063,410	\$3,036,473	\$4,164,404
Totals	382,000	\$29,068,364	\$9,660,108	\$10,576,391

SCENARIO 1: WHITEWATER PLAY PARK

A modest whitewater play park could provide 22,000 annual in-water users and 35,000 spectators, with annual expenditures by these groups of over \$3 million. The total economic value net over 50 years, discounted, would be \$157 to \$314 million, summing net benefits to users and their expenditures. It would also induce an additional 19 new jobs in the vicinity from non-local visitor spending.

SCENARIO 2: WHITEWATER CENTER

A whitewater center builds on the private users that would take advantage of Scenario 1 and expands with commercial rafting as well as increased spectator activities. It could provide 382,000 annual total visitors, with annual expenditures of \$20 million. The total economic value net over 50 years, discounted, would be over \$1 billion, including net benefits to users. It would also induce an additional 122 new jobs in the vicinity from non-local visitor spending.

INTRODUCTION

If a whitewater park were built at Willamette Falls, what economic value would it provide, and what market impacts would result?

This report addresses the economic value and potential regional economic contribution provided by a whitewater park at Willamette Falls, between Oregon City and West Linn. Communities across the country, particularly in the West, have taken opportunities presented by dam removal, channel modification, and redevelopment to invest in whitewater parks. This trend exists overseas as well, with early adopters in Europe, and new major parks in England and Australia. In some cases, the benefits are seen to be so great as to justify the whole creation of artificial rivers, with the significantly higher construction and water pumping costs those entail. Interest and involvement in outdoor sports is on the rise, and the physical, mental and social benefits make this trend an obvious target for promotion by communities. High quality outdoor recreation opportunities are desirable amenities that attract a skilled and motivated workforce, potentially improve productivity, and in turn attract businesses.

Communities can build an identity around these resources, and the resources become focal points for like-minded individuals, families and companies. The same resources that attract residents can draw even higher numbers of visitors, and complementary services such as restaurants, hotels, and equipment retail experience the impacts as well. Travel costs, distances, and access are the primary constraints on these opportunities. Predictable

and manageable conditions both for use and safety are potentially limiting factors as well.

The opportunity to provide a centralized, high-value outdoor recreation resource with a relatively small spatial footprint that is accessible, predictable, and close to other services, is rare. The public and private redevelopment efforts just beginning at Willamette Falls present a unique opportunity to transform an area that hosts a natural wonder and has been off-limits to the public for generations. A whitewater park would provide a resource under increasing demand yet regionally scarce, and complementary to other commercial and public investments. Still, whitewater parks do have substantial costs of construction and potential opportunity costs for space that might be developed in other ways as well. Therefore a sound understanding of the benefits and market impacts is necessary to consider the tradeoffs and investments necessary.

WHITewater PARKS

Whitewater parks are recreation-oriented developments that offer whitewater river-based features. Whitewater parks can be on natural riverbeds or artificial channels and they are designed to provide ideal whitewater features. Such conditions can be quite rare to find in nature, particularly with easy access or short travel distances and predictable conditions. This predictability and design opportunity also tends to make them safer than natural whitewater features. Whitewater parks can offer one to several river features, including standing waves, hydraulics, chutes, drops, eddies, and obstacles for maneuvering. Large parks or

whitewater centers can offer entire river sections that can be navigated downstream, in addition to the stationary features where people queue in smaller parks. Whitewater parks require sufficient gradient, streamflow, and space to allow design and operation. See the S2O Designs report on Willamette Falls feasibility for greater detail.

BACKGROUND AND APPROACH

Physically, the Willamette Falls provide a 40-foot drop in elevation and a coinciding waterfall with substantial year-round flow on the Willamette River. This energy has long been captured by energy companies, dating back to the late 19th century. More recently, access to the falls has been limited because the land surrounding the falls was privately owned. However, through a partnership between a private developer and public entities, the public will soon be able to access Willamette Falls. The development site is currently privately owned, but Metro and the local governments are interested in the public benefits from redevelopment.

This report details the findings of an economic analysis to identify the potential activities that would result from opportunities made available by development of a whitewater park at Willamette Falls, the economic value of these activities, the expenditures that would result, and the market impacts of these expenditures. The approach involved a series of steps:

- 1. Identify the uses, users, and volumes of usage.** Through interviews with managers and others deeply familiar with existing whitewater parks, review of reports and data, and meetings with local experts on

potential uses, we identified the types of activities and events that the park could support. We applied demand characteristics and regional data sets to estimate timing and level of usage. This process, along with preliminary design concepts by S2O Design, suggested two possible scenarios: 1) a small park with a limited number of whitewater features, primarily for private users, or 2) a large whitewater center with the potential for commercial whitewater rafting operations. Both types of parks are currently operating elsewhere with additional parks under construction. The small park aligns with the S2O Design scenario for an in-stream park. The large whitewater center aligns with the S2O Design scenarios for a Riverwalk channel, a Grand Plaza concept, and a perimeter channel.

2. Calculate the use values and expenditures. By applying whitewater park-specific data and other outdoor recreation data from multiple sources, we identified the level of value provided to users and spectators and typical expenditures levels by activity, origin (local vs. visitor), and expenditure category.

3. Calculate the economic impacts. Isolating the expenditures that originated from outside the region, we aligned the expenditures with a regional economic model we constructed using IMPLAN (Impact Analysis for PLANning) data and software. Using visitor (non-local expenditures) we identified the indirect and induced effects by business category.

FIGURE I. AERIAL VIEW



The remainder of this report details and documents the analytical process and data sources to assess supply, demand, substitutes and complements, and the expected resulting levels of use, benefit, expenditure, and total market impact.

OUTDOOR RECREATION DEMAND

Outdoor recreation plays an important role in the health and quality of life for Oregonians and visitors. Over 90 percent of Oregonians participate in outdoor recreation (OPRD 2013). Outdoor recreation plays an important role in decisions by visitors to Oregon as well. For the Oregon state park system, one-third of the 40 million annual day-use visitors are from out-of-state, as are half of the 2.3 million campers.



Many people decide to visit, live, stay, raise families, start and grow businesses, and make purchases in Oregon in part because of outdoor recreation opportunities. Well-educated and productive workers will choose to live in places with valuable outdoor recreation amenities, and possibly pass up higher-paying jobs in places where the quality of life would not be as high. Outdoor recreation opportunities not only influence where in the country people choose to live and work, but also where within the state and the community. Travel and tourism decisions are even more sensitive to the location, quality, and concentration of outdoor recreation opportunities. In these ways and others, Oregon's outdoor recreation provides a diverse suite of benefits to residents and visitors, and these directly

and indirectly spur economic opportunities for businesses, workers, and investors. Responding to these sources of demand for outdoor recreation can thus provide benefits and economic development.

Demand for outdoor recreation has played a central role in analysis of natural resources by economists for decades. The factors of demand for outdoor recreation vary across individual preferences and include a number of complex components. In one of the earliest texts on the subject, *Economics of Outdoor Recreation*, first published in 1966, the authors identify that the “whole recreation experience” provides value and includes “anticipation, travel to, experience on the site, travel back, and recollection” (Marion and Knetsch 1966 p. 49). While the benefit

derived from an experience can vary from person to person, there are costs that constrain the frequency, duration, and options. There are the opportunity costs of the participants time, travel costs, equipment and material costs, potentially access fees, and other indirect costs for food, lodging and other potential services. Benefits must outweigh costs to the individual to justify a trip.

Given the preferences and costs facing an individual, the quality of a site and the proximity of the site are the primary drivers for the value gained (benefits net of costs) from an outdoor recreation trip. Whitewater recreation opportunities are particularly scarce in the landscape compared to other forms of outdoor recreation because the right combination of hydrology, geology, gradient, and streamflow must coincide. Areas with sufficient gradient and suitable geology are often distant from population centers and complementary public and private services. Seasonal water scarcity is a typical limiting factor as well. The times of greatest demand for water-based recreation – late summer with its high temperatures – also tend to have the lowest flows on rivers and streams with suitable conditions for whitewater.

In the following sections, we analyze the conditions at Willamette Falls to understand the types of opportunities it might directly and indirectly supply, and how demands within the region and beyond might align with those offerings. We investigate and quantify demand in terms of preferences by activity type, population and their proximities by activity type, and the availability, or lack, of substitutes. Finally, we use this information about demand combined

with use levels from representative parks elsewhere to estimate types and levels of use, and the impacts on the regional economy of expenditures by non-local visitors.

CONTEXT GEOGRAPHICALLY AND PHYSICALLY

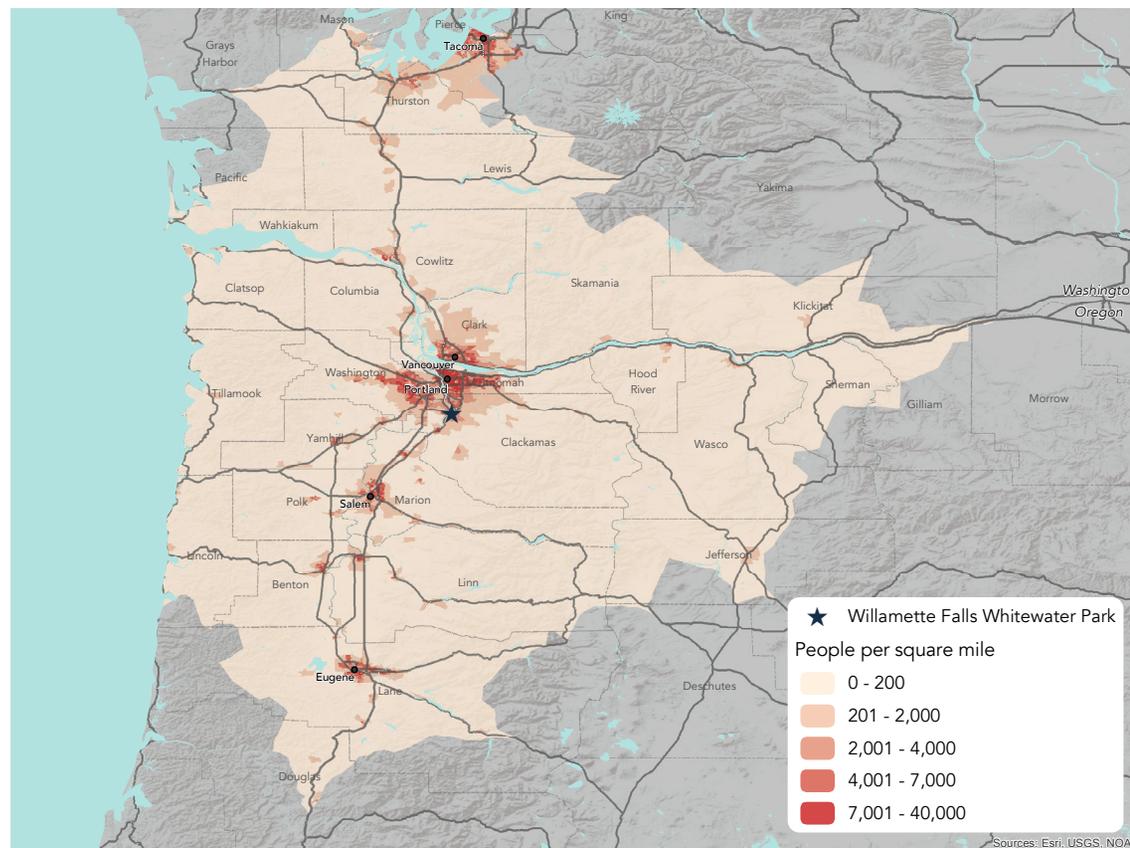
Willamette Falls Redevelopment

The use of Willamette Falls for hydropower generation and paper mill operations date to the late 1800s on both sides of the river. While Portland General Electric's hydropower facility and West Linn Paper Company continue to operate on the west bank of the falls, the Blue Heron Paper Company on the east bank closed in 2011. The shuttered paper mill's 22-acre site is currently owned by the private development Falls Legacy LLC, and is the focus of a Portland Metro planning effort, with early focus on development of a Riverwalk to access the falls for viewing. The falls have long been culturally significant to local Native American tribes as well, and mark the end of the Oregon Trail.

The Willamette Falls Legacy Project, in cooperation with the new private owners, involves Oregon City, Portland Metro, Clackamas County, and the State of Oregon. It entails a vision for Willamette Falls that emphasizes public access, habitat restoration, historic significance, and economic development. In November 2014, the Oregon City commission adopted this Framework Master Plan for the Willamette Falls Legacy Project.

Looking to the future, the development and success of the Blue Heron site depends most critically on its ability to attract visitors and new spending to the region, while providing

FIGURE 2. POPULATION DENSITY WITHIN A 3 HOUR DRIVE OF WILLAMETTE FALLS



Source: Oregon Parks and Recreation Department. 2013-2017 Oregon SCORP; U.S. Census Bureau; ECONorthwest

improvements to public space and the natural environment. A whitewater park, built in conjunction with other attractions and amenities, has potential to contribute to the economic objectives at the falls. A successful whitewater park could provide a profitable attraction that reinforces the brand of Oregon City and the region as a whole. Moreover, it would increase the number of visitors to the significant historic site, while bringing new spending to Oregon City and Clackamas County.

Regional Population

Willamette Falls lies between Oregon City (pop. 33,390) and West Linn (pop. 25,425) (PSU 2014). It is less than a 30-minute drive from the Portland city center and approximately 3 hours from Seattle. The total population in 2013 for the Portland Metropolitan Area was 2,314,554, and 3,610,105 for the Seattle Metropolitan Area (U.S. Census Bureau 2014). Populations are most concentrated along the Interstate-5 corridor (Figure 2).

The size of the population potentially using services directly or indirectly associated with a whitewater park at Willamette Falls is in the several million (Figure 3).

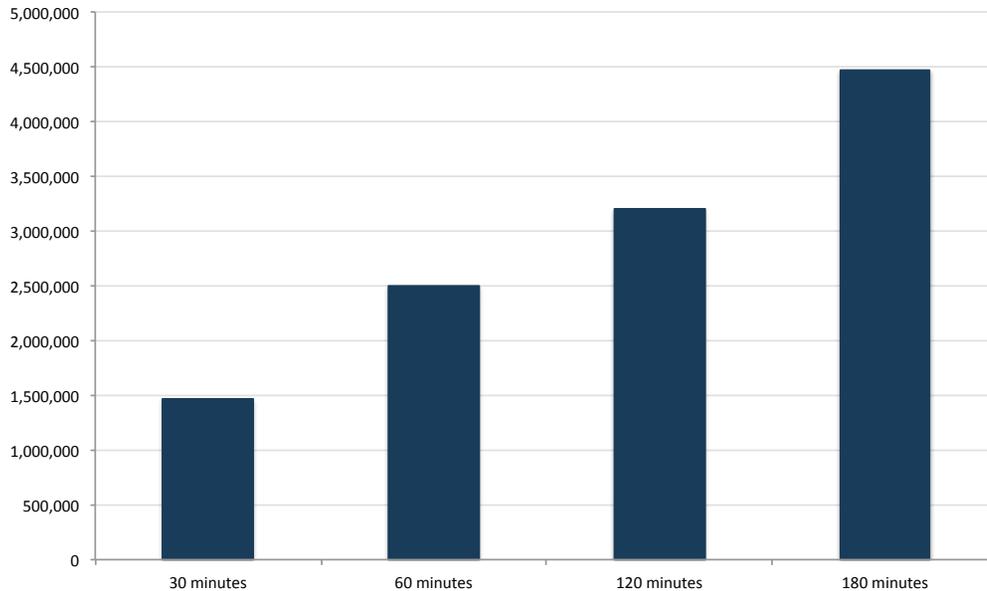
Socioeconomic Context

The Greater Portland Metropolitan Area has high natural resource quality and a populace that cares deeply about environmental health. While there are high rates of interest and involvement in outdoor recreation in the region and there are numerous high quality outdoor recreation opportunities within 1-2 hours, few are available close to urban resources. Portland has a strong regional brand of providing

an active, healthy outdoor lifestyle, with a well-educated, skilled workforce in modern businesses. The development of a whitewater park in Oregon City would further this brand, while further incorporating the Willamette Falls vicinity into the regional trends.

Non-motorized boaters in Oregon are generally well educated, with over half in a state-level survey reporting a bachelors degree or higher, and 3/4th reporting income greater than Oregon median income when adjusting for inflation (Table 2). These characteristics make boaters likely to be attractive to businesses both as consumers and employees.

FIGURE 3. POPULATION PROXIMATE TO WILLAMETTE FALLS, 2010



Source: Oregon Parks and Recreation Department. 2013-2017 Oregon SCORP; U.S. Census Bureau; ECONorthwest

TABLE I: NON-MOTORIZED BOATER DEMOGRAPHICS, OREGON HOUSEHOLDS, 2004 (N=248)

Gender:	
Male	55%
Female	45%
Age:	
18–29	8%
30 – 39	21%
40 – 49	29%
50 – 59	29%
60 – 69	10%
70+	3%
Education:	
Less than high school	3%
High school graduate	12%
Some college	25%
Bachelors	35%
Masters	17%
Doctorate	9%
Income:	
Less than \$18,000	4%
\$18,000 - \$24,999	4%
\$25,000 - \$39,999	18%
\$40,000 – \$69,999	33%
\$70,000 - \$99,999	22%
\$100,000+	20%

Note: based on 248 non-motorized boater survey respondents. Values are not adjusted for inflation.

Source: Oregon Parks and Recreation Department. Oregon Trails 2005-2014: Water Trails Plan. 2004 Oregon Statewide Trail User & Non-motorized Boater Survey Project.

WHITewater PARKS AND USAGE

EXISTING WHITewater PARKS

While there are dozens of built whitewater parks in operation around the world and several in Colorado alone, there are currently none in Oregon, Washington, or California, other than one currently under construction in Bend, OR. Whitewater parks are typically developed opportunistically, not only when the appropriate natural conditions align, but also when a waterway is undergoing restoration or reconstruction such as part of dam removal.

GRADIENT

The natural conditions primarily require sufficient gradient or drop, and a reliable water supply of sufficient water quality. Most whitewater parks involve less than ten feet of elevation drop and low flows during late summer. The whitewater park in Bend will have a total drop of less than ten feet. The nearest existing whitewater parks to the Portland Metro region are in Idaho, Nevada, and Montana. The 40 feet of Willamette Falls is more than the entire drop of the prominent artificial whitewater parks (constructed riverbed) in Charlotte, London, and Sydney. The additional gradient could be utilized for micro-hydropower or a visual waterfall feature.

STREAMFLOW

Sufficient streamflow, particularly during late summer, is the other crucial input for a whitewater park after gradient. In the western United States, seasonal precipitation patterns and snowmelt tend to drive streamflow patterns of high flows during winter and spring, and

TABLE 2: WHITewater PARKS CLOSEST TO WILLAMETTE FALLS

Whitewater Park	Location	Approximate Distance from Willamette Falls
Bend Whitewater Park (under construction)	Bend, OR	155 miles
Spokane River Whitewater Park (Planned)	Spokane, WA	360 miles
Boise River Park	Boise, ID	435 miles
Kelly's Whitewater Park	Cascade, ID	480 miles
The Truckee River Kayak Park	Reno, NV	530 miles
Brennan's Wave	Missoula, MT	555 miles
Ogden Whitewater Park	Ogden, UT	740 miles

Source: ECONorthwest

declining flows into the warm months of summer and early fall. These warm periods are the times with the most demand for water-based recreation, and the least availability. The total streamflow on the Willamette River at Newberg, the nearest upstream gage, at its lowest monthly average is still greater than the highest monthly average flow of the existing parks. In addition, substantial inflows exist between Newberg and Willamette Falls, including the Tualatin and Molalla Rivers. While the water right situation for a whitewater park at Willamette Falls is undetermined, most whitewater parks only require a few hundred cubic feet per second (CFS) of volume. The Blue Heron Paper Company had a water right of nearly 500 CFS, which PGE obtained upon the mill's closing.

SUBSTITUTES

There are numerous natural whitewater features within a two-hour driving range from Willamette Falls. Natural features however change with seasons and flows, and accessibility in terms

of travel times and adjacent infrastructure are much less desirable than a park at Willamette Falls would offer. None are within the metro region, or adjacent to other services such as restaurants and hotels. As mentioned most of Oregon's rivers face low, less-desirable water levels during the middle to late summer when water-based recreation is most in-demand because of warm temperatures. Proximity and accessibility seem to contribute to success. The whitewater parks that have experienced high usage are convenient for residents, visitors, and spectators in terms of travel times, access, predictability, experience quality, and nearby availability of complementary goods and services. In addition to its proximity to a major metropolitan area, the accessibility from major interstate highways (I-5, I-205, I-84) means that kayakers, boarders, and rafters would likely stop at Willamette Falls while on longer trips to other destinations.

Existing Whitewater Park Usage

Whitewater parks are increasingly seen by cities and developers as valuable investments for economic development, community building, and revenues. Moreover, the success of existing parks has driven many cities to explore the options in their communities.

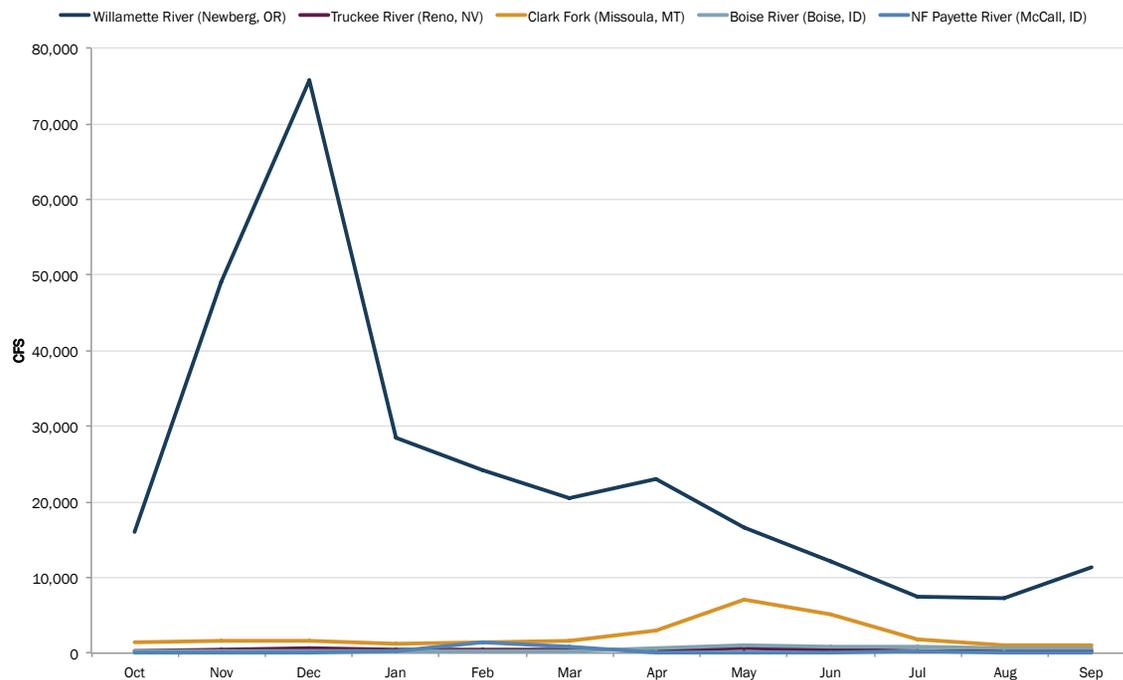
This study largely relies on the experiences of existing parks, prior analyses, and industry experts to estimate market potential and economic impacts. Accurately estimating the number of non-local users, overall participation rates, and spending levels is central to developing realistic approximations of new spending in the region. In addition, understanding the experiences of other parks provides insights into the best opportunities to generate value and economic activity with a whitewater park at Willamette Falls. For example, interviews and available data suggest that the majority of users at urban whitewater parks are not boaters or surfers but rather spectators and people biking or walking. Therefore, the construction of a new whitewater park has the potential to create economic benefits for more than just the direct in-water participants, and consequent economic activity.

The number of user days experienced at existing whitewater parks varies widely but the quality of the site, availability of substitute sites, and regional population contribute to providing a strong explanation for high use rates (Table 3). At the high end the U.S. National Whitewater Center (USNWC) in Charlotte provides 7/10ths of a mile of whitewater with 21 feet of drop and provides several other complementary activities including a ropes course, mountain-biking,

“It’s just unbelievable the opportunities we have right in downtown Missoula ... And now we have an opportunity to build one of the best waves in the world. Hopefully, we can keep raising awareness of the river’s value, and continue to clean it up.”

-Jason Shreder, Owner, Zoo Town Surfers

FIGURE 4. AVERAGE MONTHLY STREAMFLOW, WHITEWATER PARK SITES, 2013



and restaurants, all within an hour’s drive of over 2 million people. The USNWC is the 7th largest tourist attraction in the state (PLEI, 2012). It is completely artificial so streamflow is not a constraint. Other successful parks such as those in Reno and Boise (no user data yet available) similarly provide a recreation

opportunity that is not otherwise locally available, and it is accessible to a large population. Parks with lower participation rates are constrained by short periods of the year with sufficient streamflow, and competition with other parks and natural whitewater features.

TABLE 3: USER DAYS, POPULATION, AND STATEWIDE PARTICIPATION RATES BY WHITEWATER PARK

River	Location	2010 Population within 60 Minutes	User Days	Statewide Canoe/Kayak Participation Rates
Clear Creek Whitewater Park	Golden, CO	2,914,680	13,635 - 14,219	12%
Breckenridge Whitewater Park	Breckenridge, CO	47,269	1,309 - 2,307	12%
Vail Whitewater Park	Vail, CO	67,291	1,044 - 2,345	12%
Kelly's Whitewater Park	Cascade, ID	2,848	35,314 - 41,216*	13%
Sacandaga River	Saratoga/Waren County, NY	276,889	17,600 - 25,400	10%
Cuyahoga river	Kent, OH	3,258,323	10,000 - 40,000	9%
Yampa River	Steamboat, CO	32,155	75,700*	12%
Truckee River Whitewater Park	Reno, NV	555,225	100,000*	5%
East Race Waterway	South Bend, Indiana	895,060	20,000	16%
U.S. National Whitewater Center	Charlotte, NC	2,151,968	520,000*	6%
<i>Willamette Falls (Willamette River)</i>	<i>Oregon City, OR</i>	<i>2,501,765</i>		<i>13%</i>

Note: (*) Includes spectators and other visitors

Sources: Stratus Consulting (2000); Stratus Consulting. (2002). University of Idaho Extension (2012); S20, Economic Benefits of Whitewater Parks; Stratus Consulting (2005); Kleinschmidt (2004); Plei. (2012); USCG Boating, 2011 National Boating Survey.

In comparison to existing parks, the regional population in the Portland Metro Area and generally throughout the Willamette Valley, lower Columbia River basin, and Puget Sound offers a substantial potential user population. Willamette Falls in comparison to other sites has more than ample elevation drop and streamflow. The moderate climate means year-round usability. Statewide participation in whitewater boating is as high as any of the other states with available user estimates.

Existing Whitewater Events

Whitewater competitions and festivals have potential to attract thousands of athletes and

tens of thousands of spectators each year. FIBArk and the Go Pro Mountain Games annually draw more than 10,000 and 50,000 people, respectively. Due to the quality of the USNWC, it has hosted every Olympic Trials for whitewater slalom events since it opened in 2006. These events attract athletes and spectators, but they also reinforce the brand of the local community. There are no directly comparable festivals that occur in the Pacific Northwest, nor is there a whitewater park that could accommodate the highest levels of slalom competition by today's standards. The development of a whitewater park and an accompanying festival in Oregon City has the

potential to attract a similar number of visitors and strengthen the outdoor lifestyle brand of the local community. The examples below elaborate on successful whitewater festivals across the country.

Some Examples of Existing Sites

FIBARK

FIBArk is an annual whitewater festival in Salida, Colorado that dates back to June 1949. Today, the festival has a number of events and attracts more than 10,000 people each year. The festival includes multiple river events, from freestyle kayaking, to stand-up paddleboard (SUP) and slalom races. Land events include mountain bike and running competitions, a music festival and parade.

GO PRO MOUNTAIN GAMES (FORMERLY TEVA MOUNTAIN GAMES)

The GoPro Mountain Games in Vail, CO, is the largest whitewater and mountain sporting event in the U.S., attracting more than 3,000 athletes and 53,000 spectators each year. The Games include more than 25 sports, including kayaking, rafting, SUP, biking, and many others. In addition, the festival includes an art, film, and music component, all of which are free and open to the public.

U.S. NATIONAL WHITEWATER CENTER

The USNWC hosts events and competitions throughout the year. As an official training site for whitewater slalom racing, since 2006 the USNWC has hosted every U.S. National Team Trials. In addition, the water park hosted the 2008 and 2012 U.S. Olympic Trials, and will host in 2016. These events contribute to the park's 500,000 annual visitors.

RENO RIVER FESTIVAL

Beginning in 2004 with completion of the Truckee River Whitewater Park, the Reno River Festival has annually attracted competitors in several whitewater events. The festival organizers report the number of spectators has steadily grown from 14,000 in 2004 to 40,000 in 2014, and the corresponding participation numbers grew from 300 to 1000.

PENRITH WHITEWATER STADIUM

Penrith Whitewater Stadium is an artificial whitewater course outside of Sydney, Australia that hosted the 2000 Summer Olympic slalom events. It is similar to USNWC but smaller, and developed at a substantially lower cost. It is owned by the city of Penrith and not operated



Penrith Whitewater Stadium in Australia (top); Brennan's Wave in Missoula, MT (below).

for profit but rather as a public resource that is financially self-sufficient. Access is free of charge, although commercial rafting generates revenue. Rafting numbers have varied in recent years between 11,000 and 30,000 annually, according to Jack Hodge, the manager. During the 2013-2014 season, in addition to rafting, Penrith hosted 60,000 hours of paddling, with 11,000 hours of slalom training, 2300 hours of kayak instruction, and 7000 hours of rescue training (Hodge 2015).

SLALOM COMPETITIONS

Whitewater slalom is a competitive sport involving several race classes for various types of kayaks and canoes to navigate gates through whitewater. Whitewater slalom competitions occur at several scales, from local club events up to a World Cup series and highly visible events in the Summer Olympics. While some whitewater slalom events are still held on natural rivers, international competitions now must take place on artificial whitewater courses to control conditions. In recent years USNWC has hosted numerous national and Olympic slalom competitions and team trials, including for other countries. Currently, there are no whitewater slalom courses in the western United States certified for international training or competition. Currently, the Northwest Whitewater Slalom Cup is a series of 9 slalom races in Oregon, Washington, Montana, and British Columbia. All of these races take place in natural riverbeds.

Pacific Northwest Events

While not taking place in whitewater parks, a number of whitewater events and festivals do take place in the Pacific Northwest,

demonstrating interest, demand, and organization. The Upper Clackamas Whitewater Festival hosts a variety of downriver, slalom, and freestyle competitions on the Clackamas River east of Estacada. The Northwest Creeking Competition includes a series of downriver races on Class 4 and 5 whitewater on multiple rivers, typically in Southern Washington. The King of the Rogue is a series of Class 4 whitewater races for rafts, kayaks, and stand-up paddleboards on the Rogue River. The Upper Wind Whitewater Festival hosts a series of downriver races, as do other rivers, occasionally, including the Deschutes River near Bend and the White Salmon and Little White Salmon Rivers near White Salmon, WA. Formerly, the Gorge Games hosted whitewater races in the Columbia River Gorge. Whitewater freestyle events used to occur on the Clackamas River at Bob's Hole, but the natural whitewater feature has changed over time and is not always suitable for competition.

Whitewater Instruction

Schools including colleges and universities, parks and recreation departments, and private guiding and instruction programs teach whitewater kayaking, canoeing, rafting, and paddleboarding in the Willamette Valley. Summer camps and youth organizations are potential participants as well. While natural whitewater features are often more appropriate for certain skills and trip types, training in a controlled environment with predictable conditions and sufficient water during the warmest times of the year would be attractive to these programs. Whitewater instruction tends to cost over \$100 per person per day,

although half-day courses can be less. While comprehensive data do not exist, there are likely thousands of user days of whitewater instruction that occur annually in the Willamette Valley. The availability of a whitewater park with predictable conditions would likely be an attractive location, particularly July through September. Fees might be collected for commercial uses of the park.

Swiftwater

Local law enforcement, emergency services, and search-and-rescue departments and programs require swiftwater rescue training. Whitewater boaters also take these courses to improve their safety skills. There are several levels of courses for training. The 3-day course offered by Wet Planet in Husum, WA currently costs \$385 per person. The Tees Barrage White Water Centre in England rents a portion of the park for Swiftwater rescue training roughly one day a week, at a cost of approximately \$1000 (USD) per day. The Pinkston Watersports Centre in Glasgow, Scotland experiences 10 to 20 hours per week of swiftwater rescue training.

Since 1997, Northwest Rescue of Albany, Oregon, has trained groups from a number of agencies and organizations, including the U.S. Armed Forces, USCG, DEQ, EPA, and Police and Fire departments, among others. Courses range from Basic Water First Responder, to Advanced Swiftwater First Rescue Technician, and Swiftwater Rescue Boat Operator (SRBO). Relevant course prices range from \$190 to \$895 per course (NW Rescue).

ESTIMATING WILLAMETTE FALLS ACTIVITY

SCENARIOS

ECONorthwest developed the following two scenarios for Willamette Falls:

- Whitewater Play Park—Small, Public Use
- Whitewater Center—Large, Public and Commercial Use

The first scenario, involving primarily private use, is most similar to parks in Boise, ID, and the park under construction in Bend, OR. These parks provide a large local draw and attract a number of users from throughout the region. They generally involve a few play features, but insufficient length for races and rafting trips. The second scenario involves building a large commercial facility, similar USNWC, that would provide more substantial length and variety of whitewater features that would allow rafting and other downriver boating, including slalom racing.

SUPPLY— PARK POTENTIAL OPPORTUNITIES

Whitewater parks offer a variety of recreational opportunities, for groups and individuals across a variety of watercraft, and at times as organized events (Table 4). Spectator opportunities arise as well, and oftentimes spectators outnumber participants by a substantial proportion. Either size scenario would support kayaking, surfing, stand-up paddleboarding, possibly tubing, and some related training and competition events. The smaller play park scenario would not be conducive to rafting and racing activities, and associated shore-based spectator and retail opportunities are

TABLE 4: POTENTIAL ACTIVITIES AT WILLAMETTE FALLS AND EXISTING SITES

	Potential Activities at Willamette Falls	Examples
Whitewater Park Users	Canoeing	Boise River Park; Truckee River Whitewater Park; U.S. National Whitewater Center (Charlotte)
	Fishing	Boise River Park; Clear Creek Whitewater Park; Durango Whitewater Park
	Kayaking / Rafting	Boise River Park; Truckee River Whitewater Park; U.S. National Whitewater Center (wCharlotte); Vail Whitewater Park; Durango Whitewater Park
	Lessons	Kelly's Whitewater Park; U.S. National Whitewater Center (Charlotte)
	Stand-up Paddleboarding	Kelly's Whitewater Park; Boise River Park
	Surfing	Boise River Park; Pueblo Whitewater Park
	Tubing / Floating	Kelly's Whitewater Park; Clear Creek Whitewater Park; Truckee River Whitewater Park
	Swiftwater Rescue	U.S. National Whitewater Center (Charlotte); Potomac Whitewater Racing Center
	Whitewater Training Center	U.S. National Whitewater Center (Charlotte)
Events	Downriver Races	Clear Creek Whitewater Park; Salida Whitewater Park
	Outdoor Concerts	Truckee River Whitewater Park; U.S. National Whitewater Center (Charlotte)
	Slalom Races	Clear Creek Whitewater Park; Wausau Whitewater Park; U.S. National Whitewater Center (Charlotte); Potomac Whitewater Racing Center
	SUP, Kayak, or Raft Competitions	Kelly's Whitewater Park; Vail Whitewater Park
	Conferences / Weddings	Kelly's Whitewater Park; U.S. National Whitewater Center (Charlotte)
Spectator	Jogging / Running on Paths	Boise River Park; U.S. National Whitewater Center (Charlotte)
	Observing Whitewater Users	Boise River Park; U.S. National Whitewater Center (Charlotte)
	Sightseeing / Visiting Willamette Falls	Multnomah Falls; Latourell Falls; Bridal Veil Falls
	Visiting Historic Sites	Willamette Falls Electric Company - First long-distance transmission of electricity (1889)
	Walking/Bicycling the Waterfall Trail	Clear Creek Whitewater Park; Truckee River Whitewater Park

Note: Other river-based activities may also develop over time.

likely more limited as well. The larger whitewater center scenario would support downriver events and activities in addition to those activities associated with the small park scenario. The larger whitewater center would also be more supportive of expanded activities and business activity on shore.

DEMAND DRIVERS

Demand for activities potentially offered at Willamette Falls is based upon a number of factors, the most important involving the preferences of potential users with consideration of travel distance, park features and quality, quality and availability of substitute opportunities, and quality of complementary services in the area. Combining data from the Oregon Parks and Recreation Department's Statewide Comprehensive Outdoor Recreation Plan survey and the U.S. Census Bureau allows evaluation of the potential demand population in order to assess likely use levels, informed by observed usage at existing parks.

Annual user occasions for paddling and surfing activities in Oregon are nearly 8 million, based on 2011 survey results (Table 5). While incomplete and non-scientific, the membership levels of regional whitewater groups provide some insights into the numbers of potential frequent participants. PDX Kayaker has 3,849 members in a Yahoo Group, while similar regional Yahoo Groups and Facebook Groups contribute several thousand additional across Eugene, Seattle, and Bend. These are much higher numbers than for similar groups in Boise.

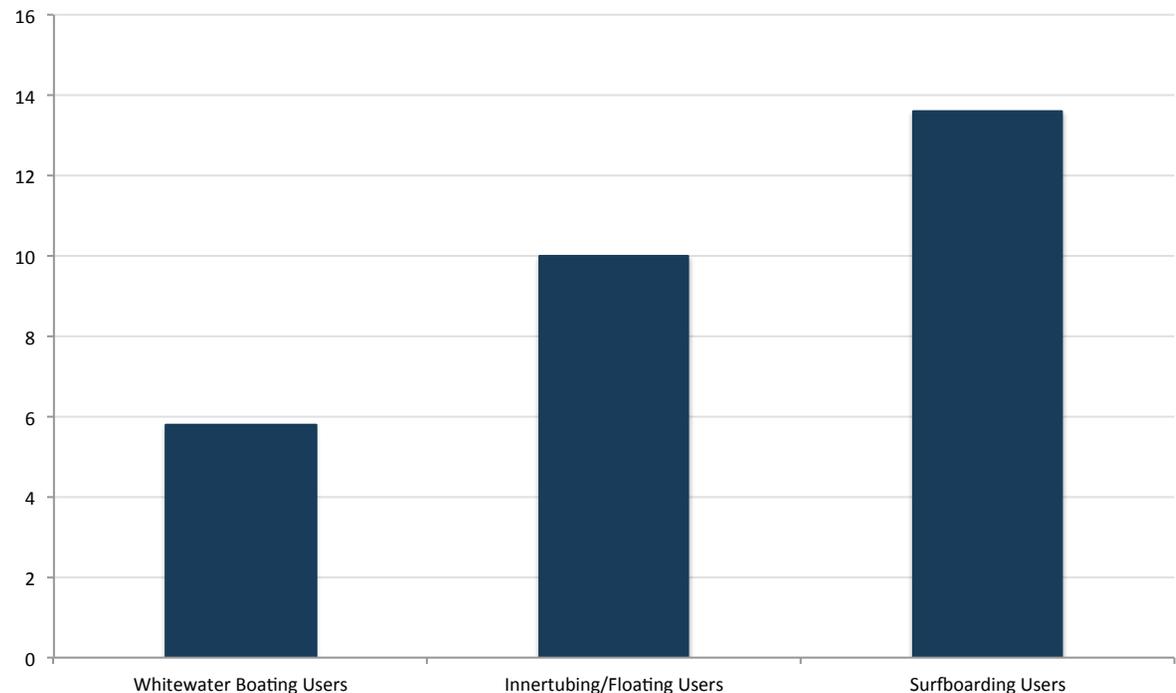
Figure 5 Source: Oregon Parks and Recreation Department. 2013; U.S. Census Bureau; ECONorthwest

TABLE 5: RELEVANT OREGON OUTDOOR RECREATION PARTICIPATION RATES, 2011

Activity	User Occasions	% Population Participating	Average # Times for Participants	Average # Household Members Participating
White-Water Canoeing, Kayaking, Rafting	2,911,759	12.5%	5.8	2.2
Flat-Water Canoeing, Sea Kayaking, Rowing, Stand-up Paddling, Tubing / Floating	3,982,657	11.7%	10	2.2
Surfing / Ocean Stand-up Paddling	906,839	1.6%	13.6	1.9

Source: Oregon Parks and Recreation Department. 2013.

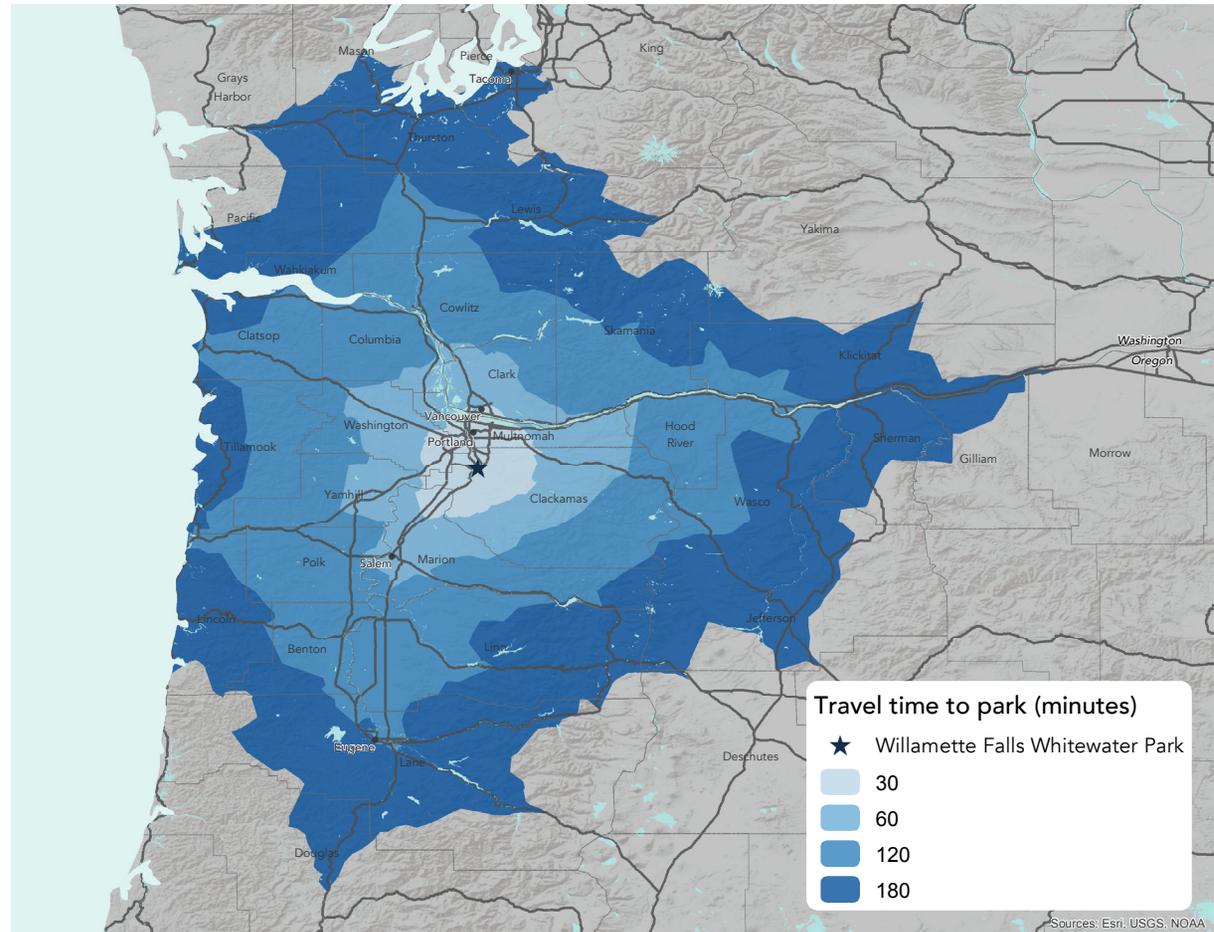
FIGURE 5: AVERAGE NUMBER OF TRIPS ANNUALLY FOR PARTICIPANTS, OREGON RESIDENTS, 2011



Surfers are a low percentage of the population but they have the highest per-user participation rates of the relevant activities (Figure 5). As Figure 7 shows, general floating participants are the most common category within proximity, followed by whitewater boaters, and finally surfers. At other parks the new opportunity for inland surfing created new users and increased participation rates.

Figure 6 displays the Pacific Northwest by travel time to Willamette Falls. Portland falls within 30 minutes of Oregon City and most of the greater Portland MSA lies within 60 minutes of the proposed park. Tacoma, Washington, is reachable in under 3 hours.

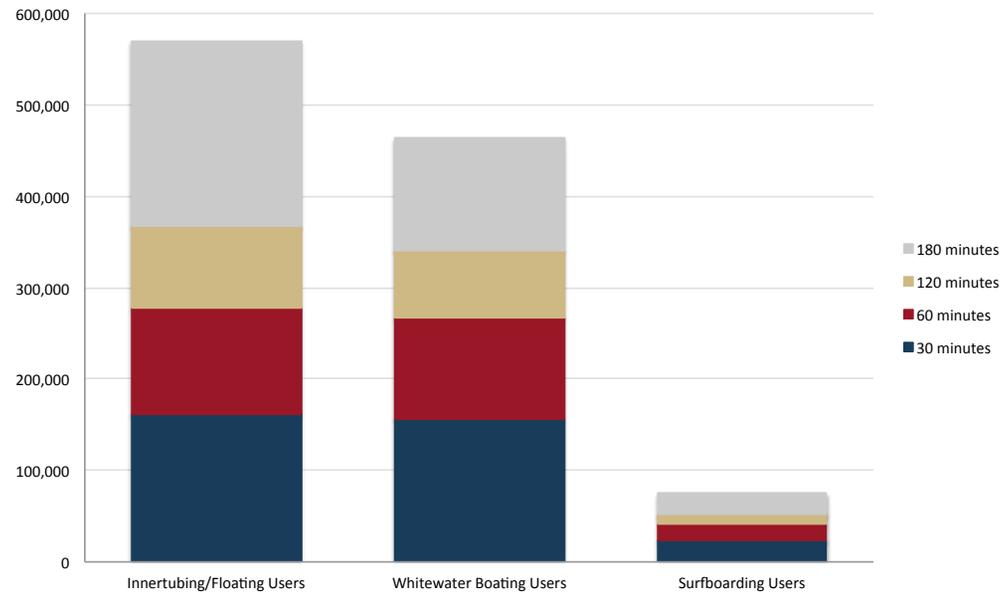
FIGURE 6: TRAVEL TIME TO WILLAMETTE FALLS



Source: ECONorthwest

Travel costs affect where people recreate and how often they recreate. Non-motorized boaters in Oregon recreate at the highest rates near their homes. However they do consistently drive long distances as well, both for those identifying non-motorized boating as their most frequent or favorite activity. Table 6 provides detailed information on the miles traveled for Oregon non-motorized boating activities. These travel distances demonstrate the general scarcity of whitewater recreation opportunities in Oregon and thus the typical requirement for extensive travel. High travel costs lead to less overall participation, particularly for lower-income demographics.

FIGURE 7: POTENTIAL WATER PARK USERS WITHIN 3 HOURS OF WILLAMETTE FALLS



Source: Oregon Parks and Recreation Department. 2013; U.S. Census Bureau; ECONorthwest

TABLE 6: DISTANCE TRAVELED FOR MOST-FREQUENT AND FAVORITE NON-MOTORIZED BOATING ACTIVITIES, OREGON HOUSEHOLDS, 2004

Miles Traveled (One Way)	Most Frequent Activity		Favorite Activity	
	Percentage	Cumulative	Percentage	Cumulative
1 – 10	25%	25%	23%	23%
11 – 20	14%	39%	13%	36%
21 – 30	12%	51%	12%	48%
31 – 40	6%	57%	5%	53%
41 – 50	10%	67%	10%	63%
51 – 75	10%	78%	10%	73%
76 – 100	10%	87%	13%	86%
Over 100 miles	13%	100%	14%	100%

Note: “Most Frequent Activity” identifies the distance of the respondent’s most frequent destination, and “Favorite Activity” refers to the distance of the respondent’s favorite location to paddle in the state. Source: Oregon Parks and Recreation Department. 2004.

USAGE ESTIMATES AND VALUES

The demographic participation data presented in the previous section demonstrates the potential user population to generate participation rates seen at other parks. We interviewed experts and practitioners familiar with similar parks, combined with interviews regarding participation patterns for whitewater activities in northwest Oregon, including consideration of weather and streamflow patterns. Building upon the experiences of similar parks, we assume 25 percent of visitors will stay overnight.

As shown in Table 7 and Table 8, we use expenditure data provided by the Outdoor Industry Association and the Army Corps of Engineers (for non-users), while using net economic benefit (benefits minus costs, also known as consumer surplus) data provided by the U.S. Forest Service. These estimates are averages, reflecting that half of expenditures and net benefits are greater, possibly much more in some cases, and half are less. These are across all user days, so an individual might spend more or less, and experience more or less benefit from one day to another. These estimates are based on meta-analysis of all available relevant studies and data.

TABLE 7: AVERAGE TRIP SPENDING FOR NON-MOTORIZED WATER RECREATION, U.S., 2014

	Users		Non-users	
	Average Day Trip Spending	Average Overnight Trip Spending	Average Day Trip Spending (spectators)	Average Overnight Trip Spending (spectators)
Food & Drink	\$17	\$44	\$5	\$17
Transportation	\$19	\$48	\$5	\$18
Recreation & Misc.	\$21	\$32	\$6	\$12
Souvenirs	\$5	\$12	\$1	\$5
Lodging	-	\$45	-	\$17
Total	\$62	\$180	\$17	\$70

Source: OIA (2012); BLS, CPI-U (2014); Change et al. (2003)

TABLE 8: AVERAGE NET ECONOMIC BENEFIT VALUES PER PERSON PER DAY FOR SELECT ACTIVITIES

Activities	Average	Pacific Coast Average	Pacific Northwest Average
Birdwatching	\$29.6		
Camping	\$37.19	\$104.35	\$92.72
Fishing	\$47.16	\$44.36	\$41.98
Floatboating/rafting/canoeing	\$100.91	\$27.84	
Hiking	\$30.84	\$23.24	\$23.98
Picnicking	\$41.46	\$64.22	\$34.74
Pleasure driving (which may include sightseeing)	\$59.23		
Sightseeing	\$36.84	\$20.27	\$60.77
Swimming	\$42.68	\$27.29	\$6.06
Visiting environmental education centers	\$6.01		
Wildlife viewing	\$42.36	\$72.84	\$35

Notes: 2014 Dollars. Average across all regions was used to calculate consumer surplus.

Source: Loomis, J. (2005); BLS, CPI-U.

SCENARIO I: WHITEWATER PLAY PARK

Based upon usage rates elsewhere, seasonal climate and streamflow patterns, and interviews with experts and managers, we developed estimates for usage rates by recreation type and season (Table 9). The seasonal breakdown is based on typical climate and streamflow patterns for the region, including the reduced availability of natural substitutes during the warmest summer months. These assume little in-water commercial activity and no organized commercial rafting or racing. We include some estimates for tubing, based on the available demographic data and the high rates of tubing that occur elsewhere. Some parks such as Reno experience much higher rates of tubing or other small personal watercraft than these. The park in Bend, based on current river usage patterns, similarly expects very high tubing numbers, as the river currently is crowded with tubers through town during the summer. Based on design, such inflatable watercraft might not be appropriate, in which case these numbers could be used to represent those other craft. Whitewater-craft continue to evolve.

Including medium-size event numbers based on events at similar-sized parks elsewhere, we assume 1650 event participants and 15,000 annual event spectators. In total including event and non-event participants and spectators, we estimate 22,113 participants for a sum total of 57,576 visitors annually under the play park scenario (Table 10). The resulting net economic benefit, that is, the economic benefits above expenditures, amount to \$4.4 million. Total expenditures amount to \$1.5 million for local users and \$1.6 million for non-local users for a total of \$3.1 million annually.

TABLE 9. WEEKLY AND SEASONAL USAGE RATES (USER DAYS), NON-EVENT, WHITEWATER PLAY PARK

Season	Activity	Weekday Average	Weekend Average	Weekly Average	Season Total
Peak-Season (3 months)	Kayaking/Rafting/Canoeing	55	110	495	6,435
	Tubing	15	30	135	1,755
	Surfing/SUP	30	60	270	3,510
	Spectators	100	200	900	11,700
Shoulder-Season (5 months)	Kayaking/Rafting/Canoeing	24	36	192	4,167
	Tubing	7	10	52	1,137
	Surfing/SUP	13	20	105	2,273
	Spectators	43	66	350	7,577
Winter (4 months)	Kayaking/Rafting/Canoeing	3	4	23	395
	Tubing	0	0	0	0
	Surfing/SUP	6	9	46	791
	Spectators	9	13	68	1,186

Note: Totals shown in Table 10. Tubing activity estimates might occur as other flotation craft depending on park design.

There is variation in usage rates experienced across existing whitewater parks, and a representative range based on data elsewhere suggests considering participation rates of 25 percent less and 50 percent more than the initial estimates to provide a range. Table 11 displays low, medium, and high private (non-commercial) use and value estimates for a Willamette Falls whitewater play park.

Utilizing the medium estimates, ECONorthwest calculated the discounted present value over time. This value includes both consumer surplus (net economic benefit) and expenditures, in an effort to estimate the total value generated from the whitewater park. Please note that these estimates exclude costs to build and operate the park and are therefore not the net present value.

TABLE 10: WHITEWATER PLAY PARK ESTIMATED ANNUAL USERS, NET ECONOMIC BENEFIT, AND EXPENDITURES BY ACTIVITY TYPE

	Activity	Users	Net Economic Benefit	Expenditures	
				Local	Overnight (25%)
Events	Kayaking/Rafting/Canoeing	1,500	\$189,696	\$69,785	\$67,555
	Tubing	0	\$0	\$0	\$0
	Surfing/SUP	150	\$18,970	\$6,979	\$6,756
Annual Totals (Event and Non-Event)	Spectators	15,000	\$692,537	\$190,074	\$260,680
	Kayaking/Rafting/Canoeing	10,998	\$1,390,812	\$511,650	\$495,301
	Tubing	2,892	\$365,677	\$134,525	\$130,226
	Surfing/SUP	6,574	\$831,345	\$305,834	\$296,061
Totals	Spectators	20,463	\$944,761	\$259,300	\$355,620
	Participants	22,113	\$2,796,500	\$1,028,772	\$995,899
	All Users	57,576	\$4,433,798	\$1,478,146	\$1,612,198

Note: Local and overnight expenditure categories are additive. Source: ECONorthwest calculations; OIA (2012); Loomis, J. (2005); BLS, CPI-U (2014); Chang et al. (2003)

TABLE 11: LOW, MEDIUM, AND HIGH USE ESTIMATES FOR THE WILLAMETTE FALLS WHITEWATER PARK, SCENARIO I

Scenarios (Use Levels)	Activity	Users	Net Economic Benefit	Expenditures	
				Local	Overnight (25%)
Low	Participants	16,585	\$2,097,375	\$771,579	\$746,924
	Spectators	26,597	\$1,227,974	\$337,031	\$462,224
	Totals	43,182	\$3,325,348	\$1,108,610	\$1,209,149
Medium	Participants	22,113	\$2,796,500	\$1,028,772	\$995,899
	Spectators	35,463	\$1,637,298	\$449,374	\$616,299
	Totals	57,576	\$4,433,798	\$1,478,146	\$1,612,198
High	Participants	33,170	\$4,194,749	\$1,543,158	\$1,493,849
	Spectators	53,195	\$2,455,947	\$674,061	\$924,449
	Totals	86,364	\$6,650,697	\$2,217,219	\$2,418,298

Note: Local and overnight expenditure categories are additive. Paddlers/Boaters represents all in-water user categories from tables above. Source: ECONorthwest calculations; Outdoor Industry Association. (2012); BLS, CPI-U (2014); Chang et al. (2003)

The U.S. Forest Service provides projections on outdoor recreation trend participation rates into the future (Cordell 2012). In addition, the U.S. Census Bureau provides regional population growth rates. We applied both of these sets of factors to estimates for future usage, resulting in over a 50 percent increase in usage by the end of the timeframe, though discounting dampens the magnitude of these growth effects in the present value calculation.

As seen in Table 12, the present value of the play park of one year ranges from \$5.6 to \$11.3 million dollars; the present value of 20 years ranges from \$87.5 to \$175 million dollars; and the present value over 50 years ranges from \$156.9 to \$313.7 million dollars. These estimates are based on a 3.5 percent discount rate, a rate typically applied by federal agencies to water resource projects.¹

Swiftwater and Instruction

The demographic and user data both for outdoor recreation in Oregon as well as for existing whitewater parks are somewhat ambiguous on inclusion of instruction and swiftwater rescue training in the overall usage and participation estimates. Based upon anecdotal reports described earlier, swiftwater rescue training might contribute on average 10 additional user days per week during the non-winter seasons, for approximately 350 additional user days per year. A range of total value (net economic benefit and expenditures of \$100-200 per user day) results in an additional \$35,000-\$70,000 annually. Whitewater instruction is even more likely to be included in the existing usage data.

TABLE 12: PRESENT VALUE OF WHITEWATER PARK FOR 1, 20, AND 50 YEARS, SCENARIO 1

	Low	Medium	High
1 Year	\$5,643,107	\$7,524,142	\$11,286,214
20 Year	\$87,475,423	\$116,633,898	\$174,950,847
50 Year	\$156,867,845	\$209,157,126	\$313,735,689

Note: This table represents the sum of expenditures and benefit beyond expenditures (surplus) from the user perspective. Assumes 3.5% discount rate. These estimates do not include costs of constructing and operating the whitewater center, and only represent the consumer/user perspective. Source: ECONorthwest calculations; OIA (2012); Loomis, J. (2005); BLS, CPI-U (2014); Chang et al. (2003)

If not though, it would be an annual addition in activity and expenditures. \$70,000 annually in instruction would generate an additional \$1.6 million in discounted economic value over a 50-year timeframe.

SCENARIO 2: WHITEWATER CENTER

Willamette Falls has the necessary water, gradient, space, and opportunity for complementary services to host a full whitewater center similar to USNWC in Charlotte, which attracts over 520,000 visitors each year (PLEI, 2012). A major whitewater center such as USNWC could draw from a broad spectrum of society, as no specific skill, training, or equipment is necessary for customers of these types of commercial activities, primarily rafting. To estimate users for a whitewater center, we start with the base of user estimates for the whitewater play park, and add the additional commercial rafters and spectators while maintaining the private levels of use. The commercial rafting estimates are based on those reported for USNWC by month, with a

breakdown between peak and shoulder months. We account for weather and natural whitewater substitute opportunity seasonality to develop these estimates. This includes a shorter rafting season in Oregon (April through October) than in North Carolina, the site of the USNWC, so we assume fewer total user days than for USNWC. We estimate 106,779 to 213,559 user days annually and 286,500 to 573,000 total visitors. Our middle estimates for annual net economic benefit and total expenditures are approximately \$29 million and \$20 million respectively.

¹Discounting in this context is used to represent the preference for receiving benefits or expenditures sooner than later. It accounts for differences in timing for some benefits and costs.

While indicative of overall economic activity, expenditures and net economic benefit do not provide valuable insights into the direct revenue streams that might be collected by the park. Using fees similar to those at the USNWC, Table 14 displays the projected total revenue generated from user fees at the proposed whitewater park. Fees for private users are typically lower than for rafters who receive gear and training. Annually, the whitewater park could generate as much as \$7.8 million dollars from user fees alone. According to 2012 tax documents, total revenue at the USNWC in 2012 was over \$18 million dollars including other purchases such as dining and spectator spending.

For a whitewater center, the present value of these benefits and expenditures are similarly greater than those for the whitewater play park scenario. Applying similar discounting and demand growth projections, the resulting net present value of benefits (not subtracting park costs) over 50 years would be over \$1 billion under these conditions (Table 15). These numbers do not explicitly include the swiftwater rescue training and whitewater boating winstruction estimates, although again they are potentially captured by the underlying user occasion estimates. If not, the \$1-2 million in 50-year present value for those activities could be even more likely to accrue under conditions of a whitewater center.

Table 13 Note: Local and overnight expenditure categories are additive. Source: ECONorthwest calculations; OIA (2012); Loomis, J. (2005); BLS, CPI-U (2014); Change et al. (2003)

Table 14 Note: Based on fees from USNWC Source: ECONorthwest calculations.

TABLE 13: LOW, MIDDLE, AND HIGH PRIVATE AND NET ECONOMIC BENEFIT ESTIMATES FOR THE WILLAMETTE FALLS WHITEWATER CENTER, SCENARIO 2

Scenarios (Use Levels)	Activity	Users	Net Economic Benefit	Expenditures	
				Local	Overnight (25%)
Low	Private Users	16,585	\$2,097,375	\$771,579	\$746,924
	Commercial Rafters	90,194	\$11,406,341	\$4,196,147	\$4,062,066
	Spectators	179,721	\$8,297,558	\$2,277,355	\$3,123,303
	Totals	286,500	\$21,801,273	\$7,245,081	\$7,932,293
Medium	Private Users	22,113	\$2,796,500	\$1,028,772	\$995,899
	Commercial Rafters	120,259	\$15,208,454	\$5,594,863	\$5,416,088
	Spectators	239,628	\$11,063,410	\$3,036,473	\$4,164,404
	Totals	382,000	\$29,068,364	\$9,660,108	\$10,576,391
High	Private Users	33,170	\$4,194,749	\$1,543,158	\$1,493,849
	Commercial Rafters	180,389	\$22,812,681	\$8,392,295	\$8,124,132
	Spectators	359,442	\$16,595,115	\$4,554,710	\$6,246,605
	Totals	573,000	\$43,602,546	\$14,490,163	\$15,864,587

TABLE 14: USER REVENUE ESTIMATES FROM COMMERCIAL WHITEWATER PARK

	Annual Users	Fees / Park Expenditures	Total Revenue
Private Users	22,113	\$10-\$30	\$221,130-\$663,391
Rafting	120,259	\$59	\$7,095,296
Total	142,372	\$54	\$7,758,687

TABLE 15: POTENTIAL GROSS PRESENT VALUE OF A WHITEWATER CENTER AT WILLAMETTE FALLS FOR 1, 20, AND 50 YEARS, SCENARIO 2

	Low	Mid	High
1 Year	\$36,978,648	\$49,304,863	\$73,957,295
20 Year	\$573,216,664	\$764,288,885	\$1,146,433,327
50 Year	\$1,027,937,437	\$1,370,583,250	\$2,055,874,874

Note: This table represents the sum of expenditures and benefit beyond expenditures (surplus) from the user perspective. Assumes 3.5% discount rate. these estimates do not include costs of constructing and operating the whitewater center, and only represent the consumer/user perspective. Source: ECONorthwest calculations; OIA (2012); Loomis, J. (2005); BLS, CPI-U (2014); Chang et al. (2003)

ECONOMIC IMPACTS

Economists have developed several approaches for measuring economic impacts of an organization for the communities in which they operate. When the data are available, a common method estimates the economic impacts associated with a company's spending on payroll and non-payroll goods and services, capital investments, charitable contributions, and taxes. This is typically referred to as the "expenditure approach."

The expenditure approach is typically conducted within an input-output modeling framework. Input-output models provide a comprehensive picture of the economic activities in a given area using mathematical relationships that describe the flow of resources and commodities between local and non-local industries, households, and the final users of the goods and services. This input-output analysis is conducted using a software program called IMPLAN.²

Economic impact analysis employs specific terminology to identify the different types and distribution of economic output in a local and regional economy.

- **Direct** impacts are those associated with payroll and employment. They also include the potential direct output of the Willamette Falls Whitewater Park, which is estimated using labor and non-labor operating expenses.

- **Indirect** impacts are generated using estimates about the Willamette Whitewater Park's purchase of goods and services from other Oregon-based businesses. These purchases, in turn, generate other interactions among businesses and are referred to as "supply-chain" impacts.
- **Induced** impacts result from direct and indirect increases in employment and income, which may enhance the overall economic purchasing power in the region. These induced effects are often referred to as "consumption-driven" impacts.

These three types of economic effects (direct, indirect, and induced) can be measured in terms of labor income, value added, and economic output resulting from expenditures associated with recreational activities in the Willamette Falls Whitewater Park.

1. *Labor Income*, or employee compensation, is a subset of output. This includes workers' wages and salaries, as well as other benefits such as health, disability, and life insurance, retirement payments, and non-cash compensation.
2. *Value Added* consists of output minus the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry, or sector.
3. *Output* represents the value of goods and services produced and is the broadest measure of economic activity.

Using this expenditure approach, we estimate the potential economic contributions of the Willamette Falls Whitewater Park using estimated spending of non-local visitors to the park. This spending is distributed across the most likely industrial sectors to be involved in direct and supporting services associated with the park. This approach assumes that local expenditures would occur otherwise. The direct expenditure potential that could occur immediately in the vicinity of the park, most likely of interest to potential park operators and associated retailers, is best represented by the expenditure information in the preceding section.

METHODS

Our analysis provides a "snapshot" of the potential economic effects derived from the recreational use of non-local visitors of a whitewater park at Willamette Falls. Since the park has yet to be constructed, our study team made assumptions about the spending pattern of visitors based on market analyses conducted on similar parks in the Western United States. All outputs from the model are shown in 2014 dollars.

In this analysis, we present the results of our economic analysis using information about how non-local visitors will choose to spend their money while using or spectating at or near the park. Additionally, capital expenditures, operating costs, and indirect revenue sources are excluded from the model since no information currently exists for the business operations for the park. These construction and operating expenditures would also have economic impacts.

¹The IMPLAN model is widely used and well respected. The United States Department of Agriculture (USDA) recognizes the IMPLAN modeling framework as "one of the most credible regional impact models used for regional economic impact analysis," following a review by experts from seven USDA agencies. IMPLAN was selected as the analysis framework for monitoring job creation associated with the American Recovery and Reinvestment Act (ARRA) of 2009.

SCENARIO I: WHITEWATER PLAY PARK

As mentioned earlier in the report, we used two scenarios to estimate the economic contributions of a Willamette Falls whitewater park. The first scenario is the whitewater play park, which assumes a smaller availability of services in the park. For this analysis we use the mid-range estimate of 57,526 visitors, with an estimated \$1.61 million in non-local visitor spending.

Table 16 presents the estimated economic effects of the smaller Whitewater Play Park for a given year. We estimate that the expenditures from non-local visitation to the park could directly generate around 14 jobs and approximately \$823,612 in output for the local economy annually. When the indirect and induced impacts are accounted for in the model, we estimate that the Whitewater Play Park could generate close to 19 jobs and \$1.3 million in economic output annually.

Table 17 illustrates how these impacts will be distributed across the various sectors in the local economy. The sectors that will benefit from the introduction of the Willamette Whitewater play park include those businesses most likely to support the tourism and recreation industries.

Restaurants and hotels, for example, will likely see a growth in demand for their services that may require additional staff to serve the influx of customers to the area. Additionally, businesses that support recreation activities and other nearby retail businesses will also see some growth in demand for their services.

TABLE 16: ANNUAL IMPACT SUMMARY FOR WHITEWATER PLAY PARK (\$2014)

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	14	\$343,516	\$440,815	\$823,612
Indirect Effect	2	\$79,789	\$156,030	\$265,232
Induced Effect	2	\$83,885	\$149,075	\$255,100
Total Effect	19	\$507,190	\$745,921	\$1,343,944

Note: Based on expenditures by visitors from outside of the Portland Metro region. Does not include expenditure by local residents.
Source: ECONorthwest; IMPLAN 2014.

TABLE 17: TOP INDUSTRIES BY EMPLOYMENT AND LABOR INCOME (\$2014)

Description	Total Employment	Total Labor Income	Total Value Added	Total Output
Food and Drink	6	148,759	156,742	306,079
Recreation and Misc.	5	107,589	158,987	288,731
Lodging	2	53,916	92,200	168,931
Souvenirs	1	22,376	20,819	41,072
Transportation	1	17,262	19,381	32,638
Other Industries	1	34,959	106,911	147,602

Note: Based on expenditures by visitors from outside of the Portland Metro region. Does not include expenditure by local residents.
Source: ECONorthwest; IMPLAN 2014.

SCENARIO 2: WHITEWATER CENTER

In the second scenario, we estimate non-local visitation and spending for a larger whitewater center. This park offers a greater variety of services and can accommodate both the private and commercial uses of the park, which in turn, is expected to draw a greater number of visitors and spectators to the park. In this scenario, we estimate the annual number of non-local visitors to be 95,500 with a combined spending amount of \$10.6 million annually.

The increased number of visitors to the area would likely also increase spending in the local economy. Table 18 illustrates the annual local economic impacts of the larger whitewater center. Our analysis suggests that the direct effects from the whitewater center would generate up to 95 jobs with an output of \$5.4 million. After taking into account the potential indirect and induced impacts in the model, we estimate the Whitewater Center could generate around 122 jobs with \$8.8 million in total output.

Table 19 displays the industries most likely to be affected by a whitewater center. Similar to the previous scenario, businesses that support visitor and tourism activities will likely see the most significant growth in demand. While the affected industries remain the same, the employment and output estimates are inflated proportionally due to the higher levels of spending derived from greater visitation in the area.

TABLE 18: ANNUAL IMPACT SUMMARY FOR WHITEWATER CENTER (\$2014)

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	95	\$2,253,543	\$2,891,848	\$5,403,082
Indirect Effect	13	\$523,433	\$1,023,593	\$1,739,981
Induced Effect	14	\$550,308	\$977,970	\$1,673,517
Total Effect	122	\$3,327,283	\$4,893,411	\$8,816,581

Source: ECONorthwest; IMPLAN

TABLE 19: TOP INDUSTRIES BY EMPLOYMENT AND LABOR INCOME (\$2014)

Description	Total Employment	Total Labor Income	Total Value Added	Total Output
Food and Drink	40	975,893	1,028,261	2,007,949
Recreation and Misc.	30	705,811	1,042,991	1,894,139
Lodging	13	353,704	604,852	1,108,229
Souvenirs	10	146,792	136,755	269,445
Transportation	3	113,242	127,145	214,114
Other Industries	6	229,336	701,362	968,305

Source: ECONorthwest; IMPLAN

IMPACT ANALYSIS LIMITATIONS

Economic impact studies can inform us about the possible answers to a very specific set of questions. In particular, these types of analyses can inform us about the other types of economic activities that may occur if a particular action is taken. When used appropriately the analytic results can help evaluate the potential size and distribution of the proposed action.

Like many quantitative tools, however, input-output models rely on a set of assumptions regarding the economy and the nature of the proposed activity. This can limit the use and interpretation of the results when discussing the overall effect of the economic activity in question. For example, input-output models are static models, which measure the flow of inputs and outputs in an economy at a given point in time.

For this analysis, we are quantifying a subset of visitor impacts on the local economy as it currently is. We do not account for changes in wage rates, input prices, or property values that may occur if the park were to be built. These are held constant in this analysis. Additionally, we do not make assumptions about how the underlying

economic relationships between capital and labor would change given the introduction of the Willamette Falls Whitewater Park.

OTHER POTENTIAL UNQUANTIFIED BENEFITS

A whitewater park at Willamette Falls is likely to generate other direct and indirect benefits besides the recreation-based benefits quantified in this study. A thorough discussion of those benefits is outside the purview of this report, but some are mentioned briefly below.

Water Quality

A whitewater park at Willamette Falls is likely to generate other direct and indirect benefits besides the recreation-based benefits quantified in this study. Communities and regulatory agencies, including the U.S. Environmental Protection Agency, recognize that with increased use of water resources, there is more benefit to maintaining and improving water quality, and consequent social, including legal, support for its protection. EPA water quality regulations are driven by use categories, particularly when a resource is designated as fishable or even

stronger at swimmable.³ This sentiment is the larger motivation behind The Big Float, a movement and event that encourages swimming and floating in the Willamette River each year.⁴

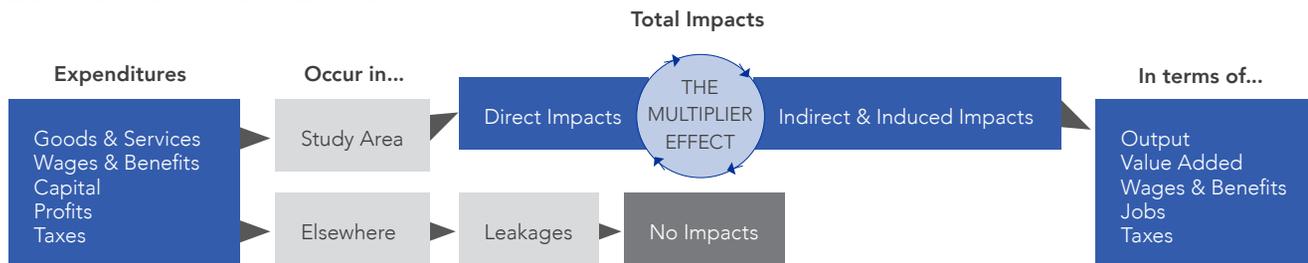
Fish

Proceeding from improved water quality conditions, fish populations and general riverine and riparian ecological conditions could potentially improve as well. The industrial areas adjacent to the falls have already been identified and designated for restoration and similar improvements as part of the Metro planning process. Increased motivation for improved water quality benefits could provide complementary benefits to these planned public investments.

Tribes

The Confederated Tribes of the Grande Ronde have a long-standing interest in access and use of the Willamette Falls area, and improvements to the fish populations and general environmental quality conditions. In addition, the increased visitor traffic provides opportunities for educational outreach and potentially revenue generation as well.

ECONOMIC IMPACT FLOWCHART



³See U.S. EPA for more detail: <http://water.epa.gov/scitech/swguidance/standards/uses.cfm>

⁴See The Big Float for more detail: <http://www.thebigfloat.com/>

Historical Interest

It is likely that the redevelopment process for Willamette Falls will preserve, highlight, and communicate elements of the various historical uses and significance of Willamette Falls. Increased and diversified visitors, particularly the young park users and spectating families, would expand the exposure and visitor traffic. This can also motivate appreciation and secondary contributions and other support, as the numerous historical and cultural groups work to achieve long-standing objectives in the Willamette Falls vicinity.

Hydropower

The Willamette Falls site features more total elevation drop than any existing whitewater parks. There might be opportunities to take advantage of this surplus head to generate energy at the start of a course, if means can be found that are compatible with other ecological and development objectives for the river in this area.

“If the will is there, the potential is there [at Willamette Falls] to build the most successful whitewater course in the world.”
-Jack Hodge – manager Penrith Whitewater Stadium

CONCLUSIONS

The Willamette Falls site features all of the fundamental characteristics necessary to provide a whitewater park at any of the stages of scale or operation currently in existence around the world. With 40 feet of gradient it has much more elevation drop than any existing parks and avoids all energy costs for water pumping. Similarly, the Willamette River flows are greater year around than other existing parks, although only a portion of the river would ever be utilized for a park and water right issues would still need to be addressed. Also, there are no good substitutes in the region, particularly during the summer when demand would be greatest.

Similarly, the socioeconomic context appears to be particularly conducive to providing extensive demand for the opportunities and services that a whitewater park at Willamette Falls would provide. There is a substantial population in the region with demographic characteristics and preferences that demonstrate high demand for outdoor recreation activities. In addition this population and these preferences show signs of steady growth over the next 50 years. Western Oregon and western Washington have millions of potential users and visitors. The other existing and likely incoming services such as

hotels, restaurants, and retail, as well as the overall character of the Portland Metro region, make Willamette Falls an attractive target for visitors choosing among a very limited set of opportunities for such whitewater recreation, particularly during summers and drought conditions.

Under a small whitewater park scenario, annual in-water user days could exceed 20,000, and the addition of spectators would more than double the visitor impact. These visitors would generate over \$3 million in expenditures annually. The non-local portion of these expenditures could generate 19 additional jobs with over \$500,000 in annual income.

Under a large whitewater center scenario, annual in-water user days could range from 107,000 to 214,000, and total visitors annually could be 287,000 to 573,000. Associated expenditures would be \$15 to \$30 million. The non-local portion of these expenditures could generate 122 additional jobs with over \$3 million in annual income.

BIBLIOGRAPHY

- Anderson Economic Group. (2014). Economic Benefits of the Grand Rapids Whitewater Project. Applied Economics. (2009). Economic and Revenue Impacts of the Proposed Oklahoma City Whitewater Park.
- Braak, W. (2012). 2011. Economic Impacts of Kelly's Whitewater Park in Cascade, Idaho. University of Idaho Extension.
- Chang, W., Propst, D., Stynes, D., & Jackson, S. (2003). Recreation Visitor Spending Profiles and Economic Benefit to Corps of Engineers Projects. US Army Corps of Engineers. ERDC/EL TR-03-21.
- Colorado River Outfitters Association (CROA). (2009). Commercial River Use in the State of Colorado.
- Cordell, K. 2012. Outdoor recreation trends and futures: a technical document supporting the Forest Service 2010 RPA Assessment. Gen. Tech. Rep. SRS-150. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station, 167 p.
- Crane Associates. (2005). The Economic Impacts of Whitewater Boating on the West River Jamaica, Vermont.
- Daniels, M., & Lazzara, F. (2005). Chattahoochee River Restoration Columbus, Georgia and Phoenix City, Alabama: Market and Economic Impact Analysis.
- ECONorthwest. (2014). Willamette Locks Economic Potential Report.
- Falls Whitewater Park Committee, Inc. (2012). A Prospective Analysis of the Economic Benefits of the Falls Whitewater Park, Neuse River, Raleigh, NC.
- IMPLAN, 2014. IMPLAN Group, LLC, IMPLAN System (data and software) 2014. 16740 Birkdale Commons Parkway, Suite 206, Huntersville, NC 28078. www.IMPLAN.com.
- Hodge, Jack. 2015. Personal communication. Penrith Whitewater Stadium Manager. February 28.
- Kleinschmidt. (2004). Skowhegan Gorge Run of River Project, Skowhegan, Maine. Feasibility Study Report.
- Loomis, J. (2005). Updated Outdoor Recreation Use Values on National Forests and Other Public Lands.
- Loomis, J. & McTernan, J. (2011). Fort Collins Whitewater Park Economic Assessment. Department of Agricultural and Resource Economics, Colorado State University.
- Morse, S. (2012). The Estimated Economic Impacts of the Ocoee River Whitewater Rafting on the Local Economy.
- Outdoor Industry Association (OIA). (2012). The Outdoor Recreation Economy: Technical Report on Methods and Findings. Southwick Associates.
- Oregon Parks and Recreation Department. 2004. Oregon Trails 2005-2014: Water Trails Plan. Oregon Statewide Trail User & Non-motorized Boater Survey Project.
- Oregon Parks and Recreation Department (OR SCORP). (2013). Statewide Comprehensive Outdoor Recreation Plan (SCORP), 2013-2017.
- PLEI. (2012). Oroville Whitewater Project Feasibility Study.
- Portland State Population Research Center. 2014 Annual Oregon Population Report. 2013 data.
- Resource Concepts Inc. (2001). Truckee River Recreation Plan.
- Rottensteiner M, Leskinen T, Niskanen E, Aaltonen S, Mutikainen S, Wikgren J, Heikkilä K, Kovanen V, Kainulainen H, Kaprio J, Tarkka IM, Kujala UM. (2015). Physical activity, fitness, glucose homeostasis, and brain morphology in twins. *Med Sci Sports Exerc.* Mar;47(3) 509-518.
- RPI Consulting Inc. (2006). City of Durango, Colorado: Economic Impacts of Whitewater Recreation.
- Sims, C. (1998). Economic Expenditure and Use Data on Whitewater Boating Activity.
- Stratus Consulting. (2005). The Potential Beneficial Values of Waters Diverted in the Yampa River for the Steamboat Springs Boating Park.
- Stratus Consulting. (2002). The Beneficial Value of Waters Diverted in the Blue River for the Breckenridge Whitewater park and in Gore Creek for the Vail Whitewater Park.
- Stratus Consulting Inc. (2000). Preliminary Evaluation of the beneficial Value of Waters Diverted in the Clear Creek Whitewater Park in the City of Golden.
- Tompsonski, P. D. 2003. Effects of acute bouts of exercise on cognition, *Acta Psychologica*, Volume 112, Issue 3, March, Pages 297-324,
- U.S. Census Bureau. 2014. American Fact Finder. www.factfinder.census.gov.
- U.S. Department of the Interior, Office of Policy Analysis. (2012). Whitewater boating recreation economics technical report for the secretarial determination on whether to remove four dams on the Klamath river in California and Oregon.