

Appendix F
Recreation Analysis



U.S. Army Corps
of Engineers
Portland District



**Oaks Bottom Wildlife Refuge
Tidal Reconnection Feasibility Study
Portland, Oregon**

Appendix F: Recreation Analysis

**DRAFT
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1 INTRODUCTION

1.1 RECREATION STUDY AREA

The proposed Oaks Bottom restoration project is located in southeast Portland, Oregon, along the Willamette River (Figure 1). Specifically, the area of interest is generally located at and adjacent to the large wetland area in the park, approximately between SE Carlton St (northern boundary) and SE Rex St (southern boundary). The lands within the project site are either owned by the City of Portland or by Metro (regional planning agency). The popular Springwater Trail bike and pedestrian path runs through the study area. The proposed recreation features (viewing platforms) would be located adjacent to the Springwater Trail, offset to the west of the main trail by a few feet as not to impede trail traffic.

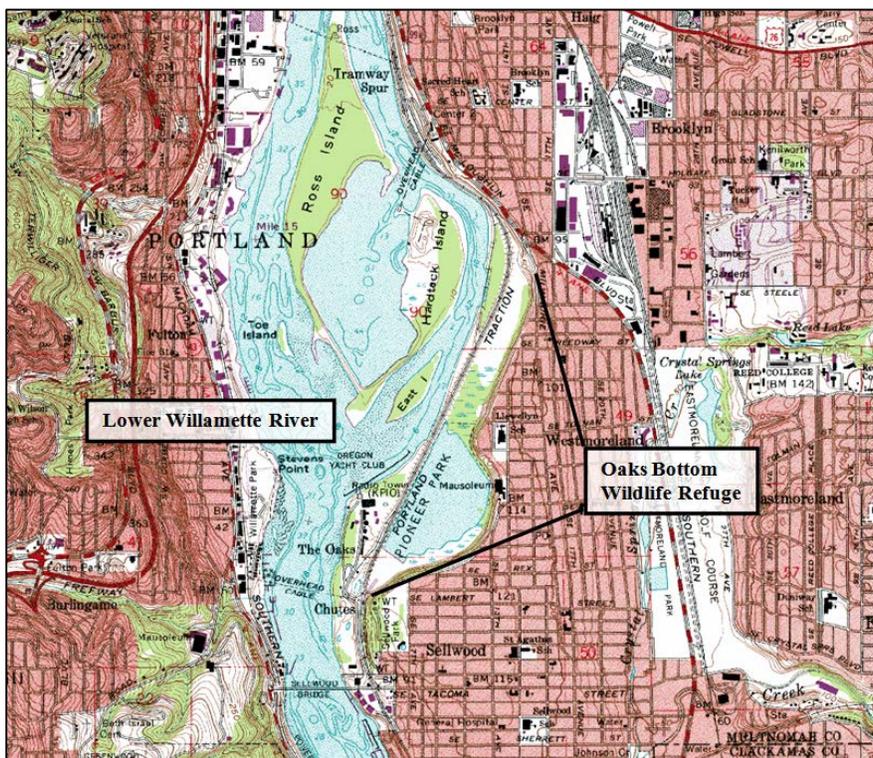


Figure 1. Oaks Bottom Wildlife Refuge Vicinity

Acquired in 1959, Oaks Bottom Wildlife Refuge is a 160-acre floodplain and surrounding upland area located along the east bank of the Lower Willamette River at approximately River Mile (RM) 16 in Southeast Portland, Oregon. Two former landfill areas are located within the park, at the north and south ends. The City of Portland acquired the south landfill property from the Donald M. Drake Company in 1969 in order to block its development as an industrial park. The area was believed to be one of the few remaining tidal marshland areas in Portland, and local residents were strongly opposed to its development as an industrial property. Local residents, students, and other groups campaigned during the 1970s to protect the wildlife habitat and provide park amenities. In 1988, Oaks Bottom was designated as the City's first wildlife refuge. Existing park amenities include natural areas, walking paths, hiking trails, and biking trails.

The park serves a number of major user groups. The bordering neighborhood to the east of the park is largely residential, and the park provides recreation opportunities for these residents. To the west of the park is the popular Oak Bottom Amusement Park, which provides carnival-style attractions to families and schoolchildren. The Springwater Trail, to the west of the park, gets approximately 1.2 million bikers, walkers, and joggers moving past the park each year (Portland Metro 2011). The large size of the park, the quality of the habitat, and its urban location, make the park especially attractive to school groups and volunteer groups seeking a location for environmental education and stewardship tours and classes. Finally, the park provides a regionally unique opportunity for bird watchers, and has been identified as a premier site by the Portland chapter of the Audubon Society (Audubon Portland 2013).

1.2 SIGNIFICANCE OF THE STUDY AREA

The study area is located along the Springwater Trail in Portland, Oregon. The neighborhood surrounding the site is a densely populated urban area. While the City of Portland as a whole contains numerous public parks, Oaks Bottom is unique due to its large size and wetland habitat. Such a park provides for a regionally unique natural area recreation experience within an urban center. Local stakeholders note that Oaks Bottom is Portland's focal point for conservation and stewardship education, as well as an example of an ecologically healthy urban environment.

Restoration treatments at Oaks Bottom would provide, with the inclusion of recreation features, significant recreation benefits as well as contributing to improved public safety for nature and wildlife viewing participants along the busy Springwater Trail. Additionally, continued restoration along the Springwater Trail is a component of Portland's regional restoration goals. Inclusion of recreation features along the Oaks Bottom wetlands would provide additional linkages to other regional trails and sites. These cohesion and regional planning benefits may not be directly measurable in the following recreation analysis, but they do serve to provide an important local and regional social context to the restoration and recreation features proposed at Oaks Bottom Wildlife Refuge.

1.3 PROPOSED RECREATION FEATURES

The proposed recreation features include two elevated viewing platforms along the Springwater Trail. The platforms would be located adjacent to the trail, above where the restoration is occurring; the platforms will not introduce people into the restoration area. The platforms would be approximately 90 feet long, including a paved landing area with bike rack, ADA accessible ramp, and main platform area. The elevated platform would be about 4 feet high to allow users to see over the traffic on the trail and take better advantage of the viewsheds to the east and west of the platforms. See Section 7 of the main report for more detail on the design of the recreation components. Benefits of the platforms would include:

- Improved public safety for trail users, as those standing still to participate in viewing would be moved off of the busy trail
- Improved viewing and lines of sight at Oaks Bottom as well as the Willamette River for bird watching, fish watching, and general wildlife viewing
- Increased capacity for viewing along the trail at Oaks Bottom
- Opportunity for interpretive signage and environmental education

This recreation analysis will evaluate the net benefits of the proposed recreation features relative to the No Action alternative to assess whether the recreation features are economically justified.

2 UNIT DAY VALUE ANALYSIS

The benefits of recreation features are measured through approximation of visitors' willingness to pay for the recreation resource. Willingness-to-pay is assumed to represent the economic value, in dollars, that a visitor places on a recreation resource. Measuring the economic value of the recreation resource without a project, then again with the project in place, allows the calculation of net recreation benefits due to construction of the recreation alternative. The Unit Day Value (UDV) method was selected as the appropriate valuation method based on the characteristics of the Oaks Bottom study. The UDV method was applied as described in Appendix E, ER 1105-2-100 Planning Guidance Notebook, dated 22 April 2000.

When applying the Unit Day Value methodology, two categories of outdoor recreation visits, general and specialized, may be differentiated for evaluation purposes. "General" refers to a recreation visit involving primarily those activities that are attractive to the majority of outdoor users and that generally require the development and maintenance of convenient access and adequate facilities. "Specialized" refers to a recreation visit involving those activities for which opportunities in general are limited, intensity of use is low, and a high degree of skill, knowledge, and appreciation of the activity by the user may often be involved (USACE, Economic Guidance Memorandum 13-03, Unit Day Values for Recreation, Fiscal Year 2013).

All of the activities at the project site, with and without project, were assumed to fall into the general recreation category. Bird watching was identified as a potentially specialized recreation activity at the site. However, specialized recreation analyses requires collection of primary data and a separate recreation study, which is incongruent with the scope and scale of the proposed recreation features for this project. Therefore, only the general recreation was utilized for this analysis.

The unit day value (UDV) method for estimating recreation benefits relies on expert or informed opinion and judgment to approximate the average willingness to pay of users of Federal or Federally assisted recreation resources. By applying a unit day value per visitor, an approximation of project recreation benefits is obtained.

The UDV process includes scoring of the project site using five guidance-defined criteria to yield a point score for the groups of recreation activities at the site. The point score is converted to dollars per visit using tables provided in the UDV guidance (updated annually). The final dollars-per-visit value is the Unit Day Value. The UDV is then multiplied by the number of annual visitors to generate an estimate of the annual recreation value at the site. This annual value is then projected over the 50 year period of analysis based on visitation projections for the study area.

This method of annual recreation value estimate is completed twice. First, a valuation is completed for the without project condition. Second, a valuation is completed for the with project alternative. The difference between the two estimates is the net recreation benefit attributable to the proposed recreation features. This net benefit is then compared to the cost of the recreation features to generate a benefit to cost ratio.

The following sections describe the development of visitation estimates and UDV scores.

2.1 VISITATION

It is important to note that “visitation” in this analysis refers to the numbers of users of the proposed viewing platforms specifically, not overall visitation to Oaks Bottom Wildlife Refuge.

Visitation estimates were developed for the without and with project conditions. No official visitor counts were available by activity. However, coordination with representatives of key user groups yielded sufficient data to characterize present and potential future use of the site. Because Oaks Bottom has been operational for some time and because it is located within an already densely populated urban area, significant visitation growth due to implementation of the proposed recreation features is not expected. Thus, visitation growth was estimated conservatively. Growth was estimated proportionally to projected population growth in the Portland area in both the without and with project conditions. Projected growth rates were based on values published by Portland Metro (Portland Metro 2009). Using an average value from the report, population is projected to grow at an annual rate of 1.54% through 2030, and then 1.22% after 2030. For the purposes of this recreation analysis, population growth was applied over the first 25 years of the period of analysis (2014 – 2038) and then flat-lined through the end of the period of analysis (2063).

The following sections present the visitation analysis for the without and with project conditions. Based on the expected level of use that the viewing platforms will experience, it is not anticipated that the proposed recreation features would cause carrying capacity concerns at Oaks Bottom, along the Springwater Trail, or in the use of the platforms themselves.

2.1.1 WITHOUT PROJECT

In the without project condition, the site of the proposed recreation features already sees significant visitation due to the traffic on the Springwater Trail, visitors to the Oaks Bottom Amusement Park, and visitors to Oaks Bottom Wildlife Refuge such as bird watchers, school groups, and other organized group visits. All user groups had growth in visitation applied in proportion to the projected population growth discussed in Section 2.1. The following table summarizes the without project visitation estimate based on coordination with user groups.

Table 1. Without Project Visitation Summary

User Group	Annual Visits in 2014	Annual Visits in 2038	Annual Visits in 2063
Audubon	1,249	1,712	1,712
School/other groups	1,640	2,249	2,249
Oak Bottom Amusement Park	4,433	6,078	6,078
Trail walkers/joggers/bicyclists	12,159	16,671	16,671
TOTAL	19,481	26,710	26,710

Note: Estimates for 2038 and 2063 are the same because population growth adjustment is capped at year 25.

The following bullets summarize the assumptions driving the visitation estimate for each user group:

- **Audubon:** Per discussion with Audubon Portland, it was assumed that an average of 30 trips to the site occur each year, with about 15 people per trip. Additionally, Audubon hosts a number of events throughout the year (camps, raptor releases, festivals) that add approximately 1,000

additional visits. It was further assumed that due to the particular suitability of the viewing platforms for birdwatchers, 85% of the total annual visitors would use the platforms.

- **School/other groups:** Per discussion with Portland Parks and Recreation, the site experiences substantial use from local and regional school groups, ranging from elementary school field trips to college class and volunteer trips. It was conservatively estimated that on average, about 80 school related trips take place each year, with an average of about 25 people per trip. It was assumed that 75% of the visitors would use the platforms, as they would be a notable feature on any walking tour of the park.
- **Oaks Bottom Amusement Park:** Of the approximately 700,000 visitors to the amusement park each year, it was estimated that 12.5% of those visitors arrive via the Springwater Trail. It was further estimated that of those visitors arriving by trail, 5% would choose to use the viewing platforms.
- **Trail walkers/joggers/bicyclists:** Of the 1.2 million trips reported along the Springwater Trail, it was assumed that 1.0% of the trips would use the viewing platforms. This conservative value was chosen because a large portion of traffic on the trail is from bicyclists, joggers, and walkers who are exercising, commuting, or taking a walk, but aren't specifically visiting Oaks Bottom.

2.1.2 WITH PROJECT

The proposed recreation features would improve the quality of viewing of natural areas and wildlife, increase opportunities for interpretive signage, and increase public safety along the busy Springwater Trail. Proximity to the Springwater Trail would allow access for bikers and walkers directly from the trail.

In the with project condition, visitation is not expected to change drastically. Installation of the viewing platforms would not drastically alter the types of recreation activities or the capacity to perform those activities at the site. However, the viewing platforms will affect the quality of existing recreation at the site.

Some growth is expected in the bird watching user group, as the viewing platforms would provide a prime location and site line for viewing as well as providing viewing to the river and new channel not currently easily viewed. Also, Audubon may consider adding more organized group trips to the site to make use of the platforms.

All user groups had growth in visitation applied in proportion to the projected population growth discussed in Section 2.1. Due to the particular attractiveness of the viewing platforms for bird watching, it was assumed that visitation for bird watching would grow by an additional 5% per year for 5 years, and then level off after that. The following table summarizes visitation in the with project condition for the years 2014 (base year), 2038 (midpoint), and 2063 (last year of period of analysis).

Table 2. With Project Visitation Summary

User Group	Annual Visits in 2014	Annual Visits in 2038	Annual Visits in 2063
Audubon	1,311	2,173	2,173
School/other groups	1,640	2,249	2,249
Oak Bottom Amusement Park	4,433	6,078	6,078
Trail walkers/joggers/bicyclists	12,159	16,671	16,671
TOTAL	19,543	27,170	27,170

Note: Estimates for 2038 and 2063 are the same because population growth adjustment is capped at year 25.

Based on these findings, annual use of the viewing platforms in the with project condition will be about 19,543 visits in the first year of the period of analysis, growing to a maximum of about 27,170 per year by the 25th year of the period of analysis. Assuming 75% of the visitation occurs during 90-days in summer, visitation estimates indicate an average daily use of the viewing platforms at about 226 visitors per day. This level of use is expected to be within the carrying capacity of the viewing platforms and is not expected to diminish the quality of the recreation experience or cause adverse impact to the environmental restoration component at the site. As noted previously, the viewing platforms will not introduce visitors to the restoration area.

2.2 UDV SCORING/POINT ASSIGNMENT

Members of the PDT from Portland Parks and Recreation were the primary experts chosen to participate in the assignment of UDV scores for the without and with project conditions. Two scores were created:

1. General recreation **without** project
2. General recreation **with** project

The five UDV criteria from the guidance, for which points are assigned, include the following items:

- Recreation Experience: score increases in proportion to the number of available activities at the site
- Availability of Opportunity: score is based on availability of substitute sites; the fewer the sites in the region that offer comparable recreation experience, the higher the score
- Carrying Capacity: score rates level of facilities at the site to support the activities
- Accessibility: score rates ease of access to the site
- Environmental: rates the aesthetic/environmental quality of the recreation site/activities

Scoring was based on the group of general recreation activities identified at the site that are relevant to the proposed recreation features, including nature and wildlife viewing, including but not limited to fish viewing, bird watching, wetland viewing, Willamette river viewing, photography, etc. Activities outside those considered, which would not be relevant to the proposed recreation features, include hiking, picnicking, or other activities that take place elsewhere in the park.

The table below summarizes the scores assigned. In the sections following the table, the rationale is provided for the point assignments according to the five UDV criteria.

Table 3. UDV Score Summary

UDV Criteria	General Recreation	
	Without Project	With Project
Recreation Experience	13	15
Availability of Opportunity	10	10
Carrying Capacity	5	7
Accessibility	14	14
Environmental	9	11
Total Score	51	57

2.2.1 RECREATION EXPERIENCE

Without Project. In the without project condition, this criteria received a score of 13 out of 30 possible points. The project site currently supports the identified general activities, and in the existing condition is a premier bird watching location, uniquely situated in an urban environment.

With Project. In the with project condition, this criteria received a score of 15 out of 30 possible points. The number and type of activities remain largely the same as in the without project condition, with the exception of fish viewing, which is not present in the existing condition, but will be possible with the project. All activities related to nature viewing along the trail will improve substantially in quality by provided designated areas which allow users to move off of the busy Springwater Trail (addressing public safety concerns) and by taking full advantage of the available viewsheds by elevating the platforms.

2.2.2 AVAILABILITY OF OPPORTUNITY

The PDT noted that visitors/user groups at the site would likely remain the same between the without and with project conditions. Because the same types activities would be available to the same user groups, it was determined that from a regional perspective, the construction of viewing platforms at Oaks Bottom would not alter the relative availability of substitute sites. Thus, in both the without and with projects, a score of 10 points was given. This score reflects that Oaks Bottom is a relatively unique resource already, and its relative ranking would not change based on the construction of the view platforms.

2.2.3 CARRYING CAPACITY

Without Project. This criteria received a score of 5 out of 14 possible points. Because Oaks Bottom already has recreation features, basic facilities already exist to conduct the identified nature viewing activities at the site. However, these basic facilities do not cater to these activities, and present conditions include public safety concerns along the Springwater Trail. Any visitors using the trail as a vantage point must share the trail with bicycle and other foot traffic.

With Project. This criteria received a score of 7 out of 14 possible points. The viewing platforms will increase the carrying capacity of the Springwater Trail along Oaks Bottom for nature viewing. Audubon Portland has indicated that they support the development of these platforms and expect that they will be used constantly by casual nature viewers as well as in Audubon’s organized field trips and

events. Addition of the elevated viewing platforms would address public safety concerns and increase the capacity of the Springwater Trail to accommodate other trail users while visitors stop at Oaks Bottom.

2.2.4 ACCESSIBILITY

Without Project. This criteria received a score of 14 out of 18 possible points. Oaks Bottom exists within the City of Portland, a major urban center. Roads exist to and from the site for vehicles; the Springwater Trail is a regional trail providing access for pedestrians and cyclists. Oaks Bottom also already contains an existing trail network consistent with its use as a wildlife refuge. The existing infrastructure and regional connectivity make existing access very good.

With Project. This criteria received a score of 14 out of 18 possible points. Because of the level of existing access-related development, the rating for the site is not expected to change with the addition of the viewing platforms.

2.2.5 ENVIRONMENTAL

Without Project. This criteria received a score of 9 out of 20 possible points. In its present condition, Oaks Bottom is a high quality natural recreation area within a dense urban center, and a unique habitat in the region. It is a focal point of conservation and stewardship for the City of Portland. The City, as well as local organizations such as Audubon utilizes the site frequently for tours, events, and environmental education. However, along the Springwater Trail, visitors aren't able to fully realize the nature viewing opportunities along the trail due to trail congestion and safety concerns which detract from the experience.

With Project. This criteria received a score of 11 out of 20 possible points. The addition of the elevated viewing platforms would bump the score into the high quality range by elevating nature viewing participants above the Springwater Trail traffic, affording the best views to the west and east of the trail. Additionally, by moving users off of the busy trail, public safety concerns are alleviated and users may better enjoy the environment.

2.3 UNIT DAY VALUE CONVERSION

For the with and without project conditions, the points were converted to a dollar value based on the FY2013 UDV conversion table in EGM 13-03 (USACE 2013). The scores were interpolated linearly as necessary. The table below shows the point conversion table from the guidance and the dollar values generated for general recreation activities.

Table 4. FY2012 UDV Conversion Table

General Recreation		General Recreation	
Point Values	Values (\$)	Value per Visit (\$)	
		Without Project	With Project
0	3.80	\$8.14	\$8.57
10	4.51		
20	4.98		
30	5.70		
40	7.12		
50	8.07		
60	8.78		
70	9.26		
80	10.21		
90	10.92		
100	11.39		
USACE CECW-CP EGM 12-03 for FY2012, 27 Jan 2012			

3 EXPECTED RECREATION BENEFITS

Using the UDV dollar values per visit and visitation estimates generated in the previous sections, recreation values for the without and with project conditions were calculated. Taking the difference between the with project and the without project, net recreation benefits were estimated. The following table summarizes expected recreation benefits in terms of net present value (NPV) and annualized value (estimated annual dollars: EAD). Amortization over the period of analysis uses the FY2013 Federal discount rate of 3.75% over a 50-year period of analysis. The analysis estimates present value net benefits of \$298,000.

Table 5. Summary of Recreation Value Calculation

	NPV (\$)	EAD (\$)
Without Project	\$4,308,600	\$192,100
With Project	\$4,606,600	\$205,300
Net Benefits	\$298,000	\$13,300

4 BENEFIT COST ANALYSIS

4.1 CONSTRUCTION COST

Construction costs were developed for the proposed recreation features. Costs are presented in Q1 FY2013 price level. The costs include O&M and Real Estate. For O&M an inspection cost of \$2,500 per year was assumed. Additionally, it was assumed that \$10,000 would be spent every ten years for periodic board/railing replacement. Real estate costs were estimated at \$250. The total estimated cost for the proposed recreation features is \$201,200. See Section 7 of the feasibility report for more detailed discussion of the costs.

4.2 EXPECTED BENEFIT TO COST RATIO

Based on the results of the recreation analysis, net recreation benefits would be approximately \$298,000 present value over the 50-year period of analysis. In this analysis, benefits exceed the cost, which is anticipated to be \$201,200 in present value. The benefit cost ratio (BCR) is therefore estimated to be 1.48. The benefits exceed the costs for the proposed recreation features, and therefore the recreation features are economically justified.

Table 6. Benefit-to-Cost Ratio by Alternative

Alternative	Net Benefits (\$)	Costs (\$)	BCR
No Action	\$0	\$0	0.00
Proposed Viewing Platforms	\$298,000	\$201,200	1.48

4.3 SENSITIVITY ANALYSIS

Visitation estimates are typically a source of uncertainty in recreation analyses. Visitation estimates directly affect the benefits of each alternative and the BCR. In order to bracket the results of the analysis, a sensitivity analysis was performed to evaluate the sensitivity of the results to visitation levels. Visitation estimates in the analysis were based on data obtained in coordination with Portland Parks and Recreation and directly from the user groups visiting the site.

The sensitivity analysis calculated the level of reduction in base with project visitation (Table 7) that would be required before the BCR fell to 1:1. In order for the recreation features to have a BCR of 1:1, total visitation over the period of analysis would need to be reduced by approximately 30% (results in BCR of 1.02). Given that visitation projections were informed by the user groups and that a large visitation reduction is required to reduce the BCR to 1:1, the sensitivity analysis concluded that the project is very likely to yield positive net benefits.

It is also worth noting that benefits could be greater than estimated if visitation is greater than the projected values rather than less. While major organizations contributing to visitation were consulted, there may be additional groups which host organized visits to the site which were not accounted for. The following table presents the results of the sensitivity analysis.

Table 7. Visitation Sensitivity Analysis Summary

% Visitation Reduction	BCR
0	1.48
5	1.39
10	1.31
20	1.17
25	1.09
30	1.02
40	0.87

5 REFERENCES

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