

Porter Levee Natural Area Site Management Guidelines

September 2004



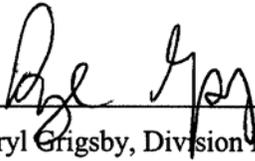
King County

Department of Natural Resources and Parks

Water and Land Resources Division

Porter Levee Natural Area Site Management Guidelines

September 2004



Daryl Grigsby, Division Director

King County Water and Land Resources Division



King County

Department of Natural Resources and Parks
Water and Land Resources Division

Office of Rural and Resource Programs

201 South Jackson Street, Suite 600
Seattle, WA 98104
206-263-3723
dnr.metrokc.gov/natural-lands

Alternate formats available
296-6519 or TTY Relay: 711

Porter Levee NA SMG_Final_September 2004.doc



Table of Contents

Acknowledgements	ii
Executive Summary	iii
Introduction	1
Part 1. General Property Information	1
Part 2. Acquisition, Funding Source and Deed Restrictions	2
Part 3. Ecological Resources.....	3
Part 4. Land Use and Infrastructure	6
Part 5. Site Management Chronology	9
Part 6. Analysis	12
Part 7. Management Goals, Objectives and Recommendations	15
Appendix: 1999 Porter Levee Section 1135 Restoration Project.....	20
References:.....	21

List of Tables

Table 1. Porter Levee Natural Area general information.	1
Table 2. Porter Levee Natural Area parcel information.	2
Table 3. Primary management activities associated with the Porter Levee Natural Area.	9
Table 4. Porter Levee Natural Area Recommendations: budget, schedule and staff matrix	19

List of Figures

- Figure 1. Porter Levee Natural Area Vicinity Map**
- Figure 2. Porter Levee Natural Area Natural Resources Aerial Photograph**
- Figure 3. Porter Levee Natural Area Existing Conditions Aerial Photograph**

Acknowledgements

Planning Team:

King County Department of Natural Resources and Parks

Josh Kahan, Green River Basin Steward, Water and Land Resources Division (WLRD)

Ingrid Lundin, Natural Resource Planner, WLRD

Deb Snyder, Natural Resource Planner, WLRD

Scott Snyder, Resource Coordinator, Parks and Recreation Division

Jennifer Vanderhoof, Ecologist, WLRD

Reviewed By:

King County Department of Natural Resources and Parks

Robert Fuerstenberg, Senior Ecologist, Watershed and Ecological Assessment Team, WLRD

Andy Levesque, Senior Engineer, Flood Hazard Reduction Services, WLRD

Report author:

Deb Snyder
Natural Resource Lands Management Program
Office of Rural and Resource Programs
King County Department of Natural Resources and Parks
201 South Jackson Street, Suite 600
Seattle, WA 98104-3855

(206) 263-3723

Suggested citation for this report:

King County. 2004. Porter Levee Natural Area Site Management Guidelines. King County Department of Natural Resources and Parks, Water and Land Resources Division. Seattle, Washington.

[Available: King County Department of Natural Resources and Parks

Executive Summary

The 50-acre Porter Levee Natural Area is located in south King County, east of Auburn. The site borders the Green River on both the right and left banks between River Mile 34 and 35, just upstream of the Highway 18 intersection with the Green River. The surrounding properties support agricultural uses, residences, a Washington Department of Fish and Wildlife boat launch, and King County property managed by the Property Services Division.

The site contains wetlands, remnant side channels, and a small, unclassified stream. A forested riparian zone is established on both sides of the river at the site. The vegetation on the site is primarily pasture grasses, reed canarygrass and Himalayan blackberry in the upland areas with some red alder, willows and cattails in the riparian and wetland areas.

The Middle Green River supports coho, chinook, and chum salmon, steelhead, rainbow, and cutthroat trout. Bull trout have also been found. Chinook and bull trout are listed as threatened under the Endangered Species Act. Other verified wildlife includes deer, mergansers, great blue herons, beaver and bald eagles.

The King County Water and Land Resources Division acquired Porter Levee Natural Area in fee for fish and wildlife habitat restoration and open space for \$395,000 in 1998 and 1999. Funds were obtained from the Elliot Bay/Duwamish Panel and reclassified 1989 open space bond fund. The US Army Corps of Engineers (the Corps) breached the levee located on the left bank of the Green River at the site in two locations in 1999 to create a hydraulic connection between the Green River and a remnant side-channel. The project was designed to improve habitat for juvenile salmon. An additional 1000 trees were planted on the site in 2000 to enhance habitat and outcompete invasive vegetation.

The site will be managed for the protection of the site's ecological value. Appropriate public access and interpretive opportunities are accommodated where they do not harm the ecological value of the site. Porter Levee is used for fishing; however, use appears to be relatively low. Dumping at the Green River Road access is a frequent problem. There are no obvious revenue generating opportunities at the site at this time. The following management recommendation have been made for the site:

Understand implications of management and restoration actions

- ❑ Complete an ecological assessment designed to gain a more thorough understanding of the species that use this area.
- ❑ Coordinate site enhancement opportunities

Restoration and Enhancement

- ❑ Continue conversations with the Corps regarding the advisability of the proposed Porter Levee Setback project intended to allow the Green River to move freely at the site.
- ❑ Control and monitor invasive vegetation and maintain and monitor revegetation projects.
- ❑ Consider installing a shrub layer in the area of the 2001 planting when monitoring indicates that the mowing regime and native plantings have largely controlled the invasive species.

Public Use

- ❑ Allow the current level of passive recreation opportunities such as fishing, nature observation, and walking. Note changes in visitor numbers and types of recreational activities and report noticeable visitor impacts on the ecological values of the site.

- ❑ Install and maintain a “rules” sign, a “no motor vehicles” sign, and a “no hunting” sign at the access off Burr Mosby’s road, the access beside Green Valley Road, and the access off of Lake Holms Road. Consider installing “Pack-it-in, Pack-it-home” signs on this property if litter activity increases.
- ❑ Monitor the site monthly for encroachment, dumping, and other trash and respond as necessary to maintain a clean and safe property. Remove the dumped materials on the abandoned road leading off of the SE Lake Holms Road access.

Porter Levee Natural Area Site Management Guidelines

Introduction

Porter Levee Natural Area is a King County Department of Natural Resources and Parks (DNRP) Ecological Land. Ecological Lands are a category of Water and Land Resource Division (WLRD) properties managed for the protection of their ecological value. Appropriate public access and interpretive opportunities are accommodated on these sites where they do not harm the ecological value of the site.

This document provides general property information, a description of existing site conditions, a chronology of land management actions, and a list of management objectives and recommendations for the Porter Levee Natural Area. Site management guidelines are developed using guidance established in the *King County Water and Land Resources Ecological Lands Handbook* (King County 2003a).

Part 1. General Property Information

The Porter Levee Natural Area is located along the Green River in south King County between River Mile 34 and 35, just upstream of the Highway 18 intersection with the Green River, and east of Auburn, WA. (Refer to Figure 1 for a general vicinity map.) To the south, row crops are grown on a property enrolled in the King County Farmland Preservation Program (FPP). To the west are Green Valley Road, Green Valley Meats, and other farm properties. To the north is a Washington Department of Fish and Wildlife boat launch, and to the east is residential property, Lake Holms Road, and King County property managed by the Property Services Division (parcel number 2121059065). Downstream of Porter Levee Natural Area are the Hatchery and Auburn Narrows Natural Areas.

Table 1. Porter Levee Natural Area general information.

Best Available Address	12550 SE Green Valley Road (unofficial)
Thomas Guide Map	Page 746
Legal Description	Section 21, Township 21 N, Range 5E, W.M.;
Acreage	50.36
Drainage Basin	Middle Green River
WRIA	9
Council District	9
King County Sensitive Areas	100-year floodplain, wetlands, erosion, landslide, and seismic hazards; severe and moderate channel migration zones

Table 2. Porter Levee Natural Area parcel information.

Parcel Number	Acres*	Purchase Date	Ownership type/price	Other Names	Zoning	Funding Source
2121059004	30.28	6/29/1998	Owned in Fee \$200,000	Fallick Porter-Black-Burns Auburn Investors	A-10 APD	Elliott Bay/ Duwamish Panel
2121059004 (Formerly a portion of 9007)	3.88	10/27/1998	Owned in Fee \$27,000	Carver Porter-Black-Burns	A-10 APD	
2121059001	15.16	2/1/1999	Owned in Fee	Bottemiller Green River	RA-10-SO	Reclassified 1989 Open Space Bond Funds
1621059020	1.04	2/25/1999	\$168,000	Additions 5 and 6	RA-5-SO	

*acreage taken from the King County Assessor's map.

Part 2. Acquisition, Funding Source and Deed Restrictions

The King County Department of Natural Resources Water and Land Resources Division (WLRD) acquired part of the Porter Levee Natural Area (parcel number 2121059004, former owner Fallick and Carver) in fee for fish and wildlife habitat restoration for \$227,000 in 1998. A restriction is included in the statutory warranty deed that requires that the property be used in perpetuity for habitat development. It was purchased with funds from the natural resource damage assessment settlement for damages along the Duwamish River. The Elliott Bay/Duwamish Restoration Program's *Intertidal Habitat Projects Monitoring Program*, p. 1-3, describes the history of this funding source:

In 1990, a lawsuit was filed against the City of Seattle and the Municipality of Metropolitan Seattle (Metro) by the United States of America on behalf of the US Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) under its authority as a natural resource trustee provided by the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The lawsuit was filed to recover damages "for injury to, destruction of, and loss of natural resources resulting from releases of hazardous substances...into the environment in and around the Duwamish River and Elliott Bay, for the costs of restoring, replacing or acquiring the equivalent of the affected natural resources, and for the cost of assessing the damage to the affected natural resources" (U.S. vs. City of Seattle and Metro, 1991).

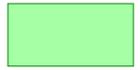
Rather than engage in lengthy and costly litigation, the City of Seattle and Metro, along with natural resource trustees, worked out a settlement agreement to establish a program to help restore and replace natural resources of Elliott Bay and the lower Duwamish River. The Consent Decree established a program for sediment remediation, source control and habitat development, known as the Elliott Bay/Duwamish Restoration Program, or EB/DRP.

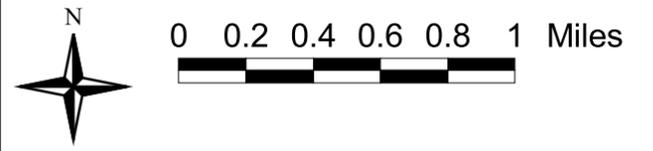
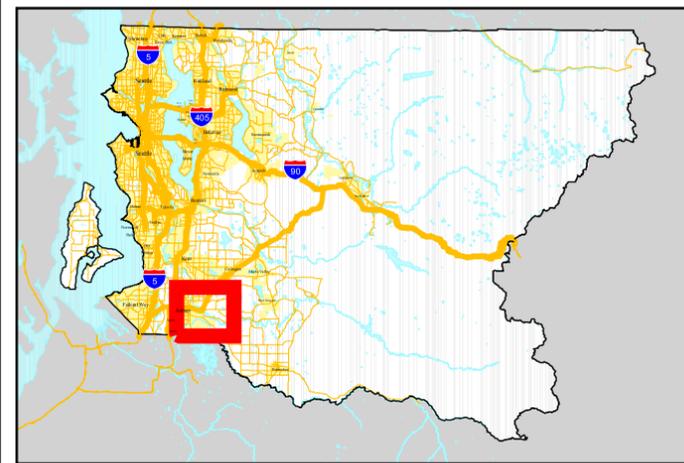
In seeking to meet EB/DRP habitat restoration objectives, the first step was to obtain "real property interest" in sites for restoration work. The Consent Decree established a responsibility on the part of the City of Seattle and King County to provide up to \$5 million in property value for this purpose. Following a ranking of potential restoration sites....project sites were then selected. The Panel requested either King County or the

Figure 1

Porter Levee Natural Area

Vicinity Map

-  Porter Levee Natural Area
-  Parks
-  Natural Areas
-  Cities



 **King County**
Department of Natural Resources and Parks
Water and Land Resources Division
April 14, 2003

The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

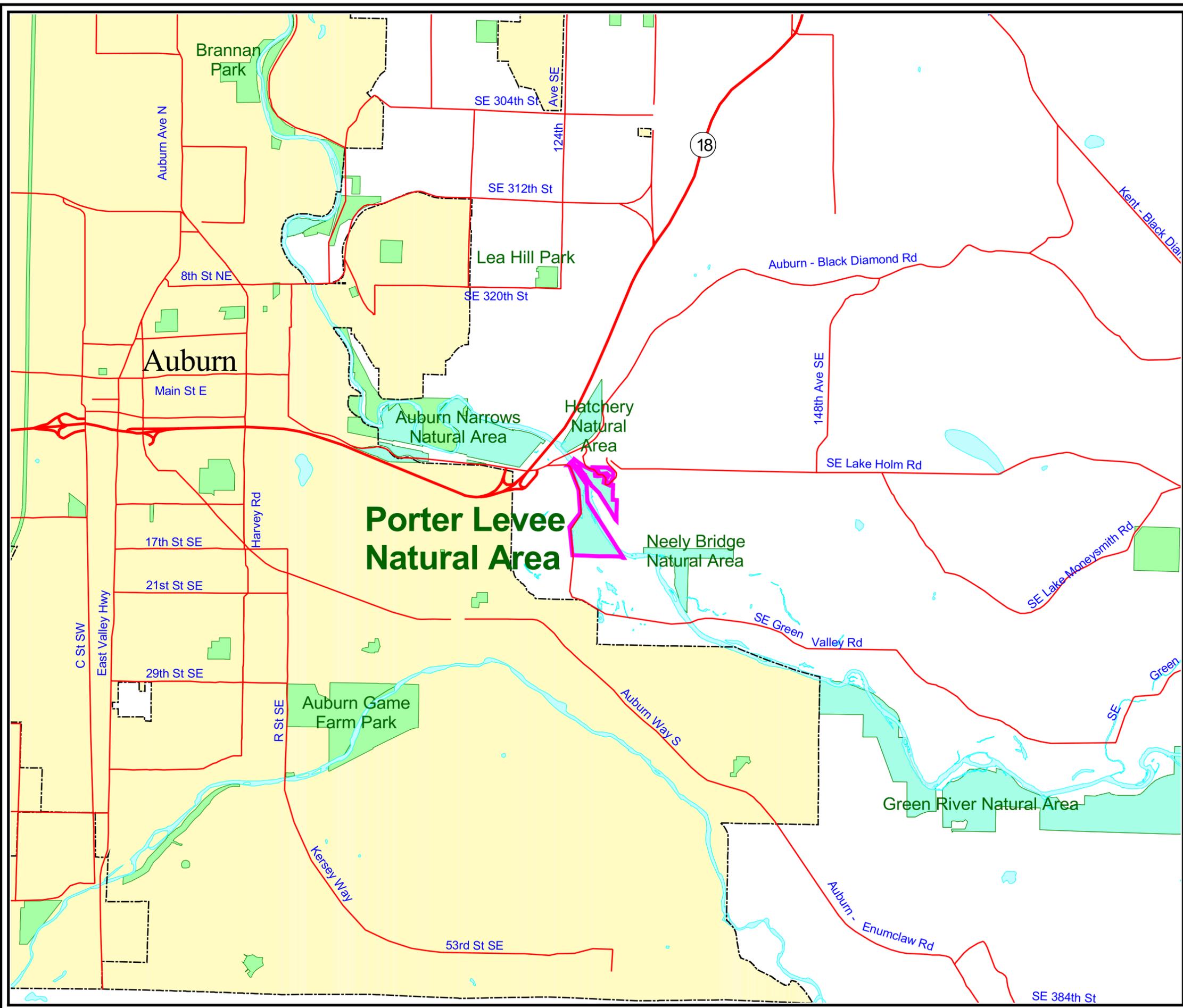
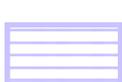
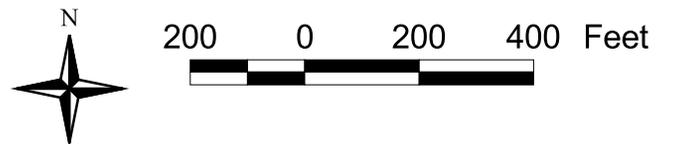


Figure 2

Porter Levee Natural Area

Natural Resources

-  Site Boundary
-  Restoration Areas
-  Parcels
-  Contours (20 foot)
-  100 Year Floodplain



 **King County**
Department of Natural Resources and Parks
Water and Land Resources Division
April 14, 2003

The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

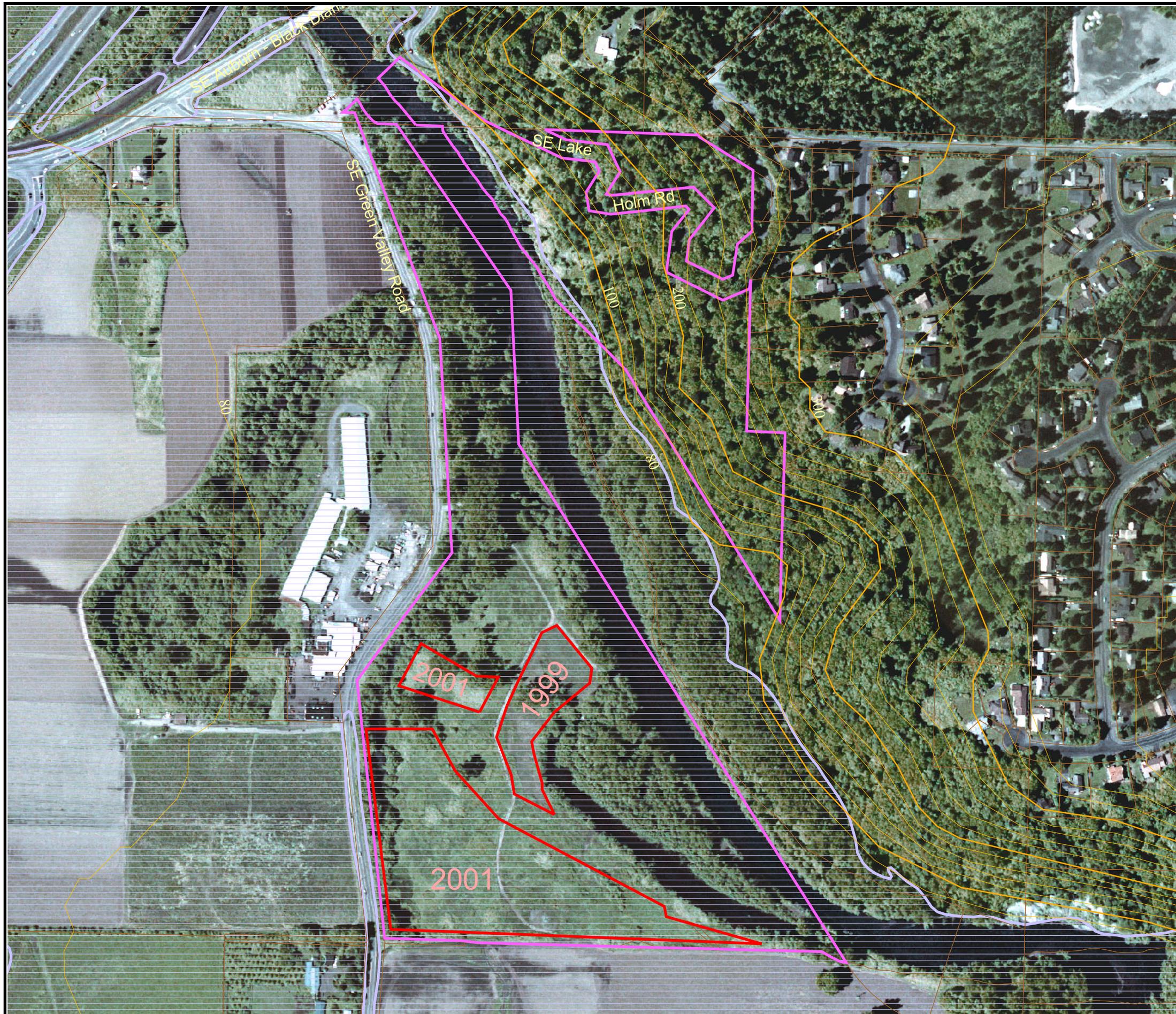
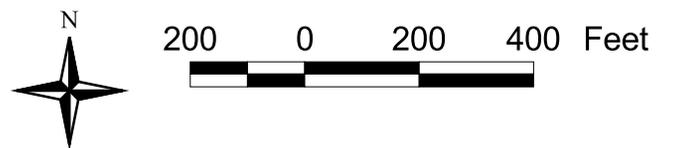


Figure 3

Porter Levee Natural Area

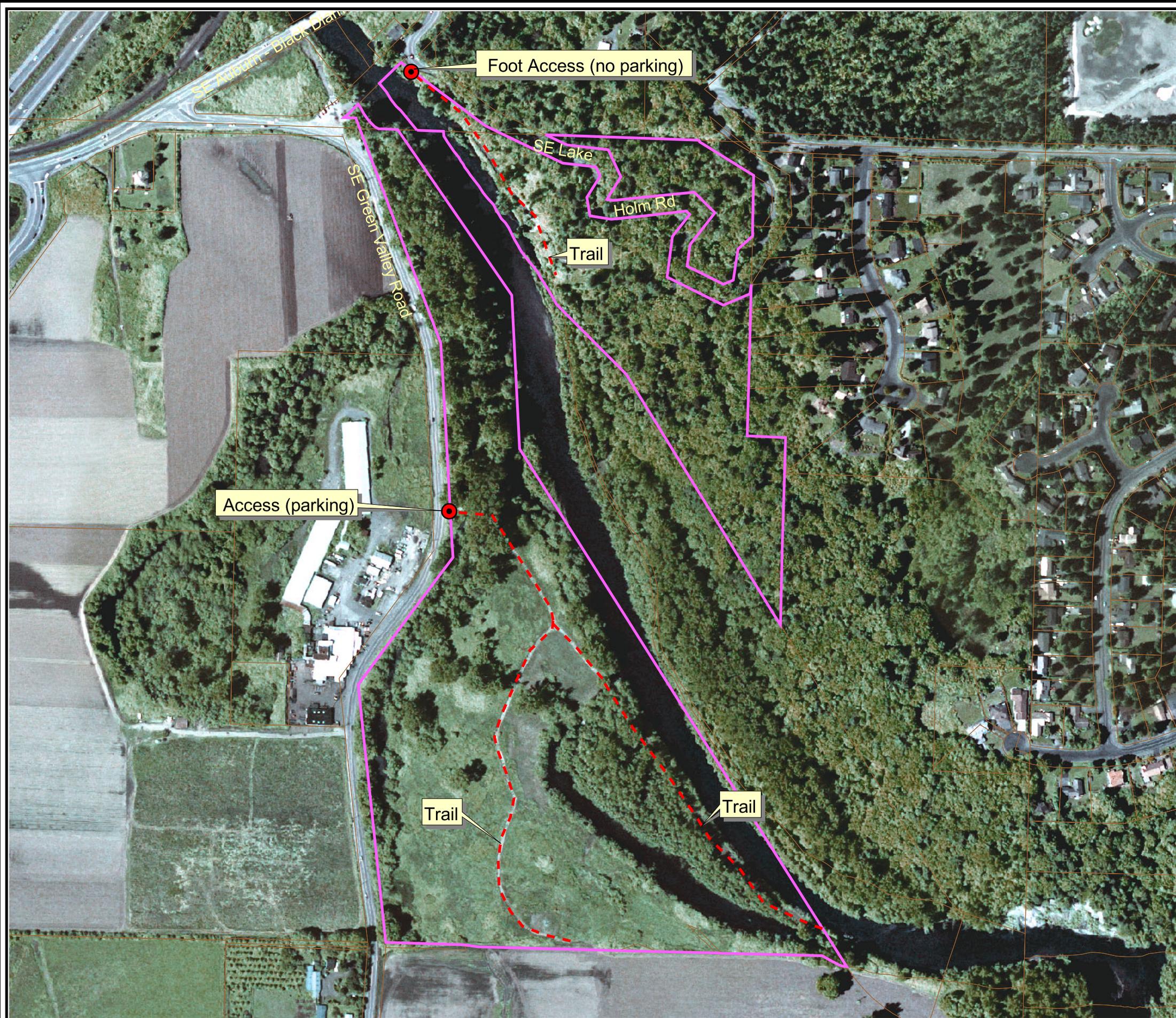
Existing Conditions

-  Site Boundary
-  Access Points
-  Trails
-  Parcels



 **King County**
Department of Natural Resources and Parks
Water and Land Resources Division
April 14, 2003

The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.



City of Seattle to engage in negotiations for either the acquisition of real property or easement in perpetuity for priority sites. At the conclusion of successful negotiations, the Panel credited King County or the City the cost of property or easement acquisition, toward fulfillment of the real property obligation of up to \$2.5 million each.

In addition to habitat development sites in the lower Duwamish River, EB/DRP committed \$700,000 for two sites upstream of this area in the Green River, Porter Levee and Lones Levee.

An additional 16.2 acres on the right bank of the Green River was purchased from Everett Bottemiller in 1999 for \$168,000 with reclassified 1989 King County Open Space Bond funds.

King County voters authorized the \$117,640,000 King County Open Space Bond initiative, described in King County Ordinance 9071, in November 1989 to provide funds for the acquisition, development, renovation and improvement of public green spaces, green belts, open space, parks and trails in King County. Specific goals included preserving wildlife, enhancing scenic vistas, providing access to the water and open space, and providing trail connections between virtually all the cities in King County to a regional trail system and trails within the suburban cities and unincorporated areas of King County (King County 1989).

King County Ordinance 9071 authorizes reclassification of bond funds in Section 8, part C. Land use restrictions associated with Open Space Bond funds are identified in Section 8, part D:

Projects carried out by a Governmental Agency in whole or part from bond proceeds shall not be transferred or conveyed except by agreement providing that such land shall continue to be used for the purposes contemplated by this ordinance; nor shall they be converted to a different use unless other equivalent lands and facilities within the Governmental Entity shall be received in exchange therefor. The proceeds of any award in condemnation of any project shall be used for the acquisition or provision of other equivalent lands and facilities. However, nothing in this ordinance shall prevent the granting of easements, franchises, or concessions or the making of joint use agreements or other operations agreements compatible with the use of a Project as provided for in this ordinance.

Easements

The King County unit responsible for flood hazard issues established an easement for construction and ongoing maintenance of the levee on site in 1961. This easement allowed access over the parcel for the maintenance and construction of flood protection projects along the left bank of the Green River. King County Flood Hazard Reduction Staff are currently exploring the legal issues associated with the validity of King County having an easement on a property that the County has since purchased in fee.

Part 3. Ecological Resources

This section describes the natural resources and ecological processes present at the Porter Levee Natural Area. A complete biological inventory has not been conducted at this location. Therefore, the information presented here is not comprehensive. Porter Levee Natural Area lies within the Middle Green River Reach. Please refer to the Middle Green River Reach report (King County 2003b) for landscape-level natural resource and land use information.

Figure 2 is an aerial photograph of Porter Levee Natural Area showing topography and restoration projects.

Topography and Soils

The portion of Porter Levee on the left bank of the Green River is flat river valley property composed of Oridia silt loam, Puyallup fine sandy loam, Pilchuck loamy fine sand, and Newberg silt loam. Riverwash exists between the reconnected side channel and the river.

The portion of Porter Levee Natural Area on the right bank of the Green River is composed of riverwash in the flat area and Alderwood and Kitsap soils in the steep slope areas. The Alderwood and Kitsap designation is composed of about 50 percent Alderwood gravelly sandy loam and 25 percent Kitsap silt loam. Characteristics of this soils designation are 25-70 percent slopes, rapid runoff, severe erosion hazards and severe slipping potential (USDA 1973). (Please refer to Figure 2.)

Hydrology

The Green River is adjacent to the Porter Levee Natural Area. (Please refer to figure 2.). The site is named after the Porter Levee, built along the left bank of the Green River by King County Pubic Works in the early 1960's as part of a program to confine and straighten the river throughout much of it's length. Like most levees constructed in this era within the Middle Green River Valley above SR-18 , the levee is discontinuous and does not tie into high ground at either end. The levee's upstream end is located several hundred feet downstream of another levee adjoining the upstream Mosby Brothers' Farm. (Levesque pers.comm.)

The Porter Levee was overtopped and a portion washed out in floods during the 1980's. The United States Army Corps of Engineers (USACE) repaired this levee with King County acting as the contractual local sponsor for ongoing maintenance of the repaired levee system. Flooding in 1990 and 1996 partially breached the levee near its downstream terminus, resulting in the reoccupation of small side-channels in this reach by flows from the mainstem river. The King County unit responsible for flood control facilities decided against further repairs to the levee system on this site because the levee did not provide continuous protection, did not contain the 100-year flood, and was located entirely within the FEMA regulatory floodway and a King County Sensitive Areas Ordinance buffer for salmonid bearing streams. (Levesque pers.comm.)

The US Army Corps of Engineers (the Corps) breached this levee in two locations in 1999 to create a hydraulic connection between the Green River and a remnant side-channel (also referred to as a pond prior to reconnection) that was blocked when the levee was constructed. The project was designed to allow flows above 1,500 cfs to pass through the upstream notch in the levee (typically from November through May) and flows above 400 cfs to enter the downstream notch to provide access for juvenile salmon from approximately October through July (Kahan pers.comm.).

Nearly the entire left bank portion of the Porter Levee site itself is wholly within the mapped 100-year FEMA floodplain, and most of it is also within the FEMA regulatory floodway. The extent of the 100-year floodplain shown in Figure 2 differs from that published by the Federal Emergency Management Agency (FEMA, 2001), and is based on preliminary flood boundary work maps produced by King County in draft form (King County, 1996). Even though published more recently, the FEMA maps are based on survey information obtained in 1989. Because more recent floodplain survey results were incorporated into the 1996 King County draft maps, they are considered to represent the best available information to date. The floodplain boundaries shown in figure 2 therefore cover a substantially larger area than that shown on the published FEMA maps. Based on even more recent channel migration downstream from the Porter Levee site, together with preliminary gauge results documenting recent river stages near SR-18, it is likely that additional studies will be required to more precisely define 100-year floodplain boundaries

affecting the Porter Levee Natural Area, and adjacent lands. The King County Flood Hazard Reduction Services Section is seeking grant funding to pursue these additional flood-mapping studies, proposed for 2005. Significant inputs of both sediment and LWD may be anticipated in the future at this site, due to recent and ongoing landslide activity in the vicinity of the Neely Bridge Natural Area upstream of the site, along the Right Bank near River Mile 34.7. (Levesque. pers. comm.)

Two sources for wetland information are currently available. A wetland delineation (conducted by the Corps on April 1, 1999) on the left bank portions of Porter Levee identified the former pond (now the reconnected side channel) and its immediate saturated surroundings as wetlands. Other wetlands on site “include the swale and some isolated patches on the rest of the property. These areas are variously dominated by willows, salmonberry (*Rubus spectabilis*), stinging nettles (*Urtica dioica*), creeping buttercup (*Ranunculus repens*) and reed canarygrass” (USACOE 1999). King County’s wetlands inventory currently maps two wetland areas. However, these wetlands appear to be drawn incorrectly in the geographic information system. Therefore, we have not included them in Figure 2.

Another side channel is located downstream of the former pond and a small, unclassified, unnamed stream flows along the west side of the property.

Vegetation

A forested riparian zone is established on both sides of the Green River at the Porter Levee Natural Area, and it continues upstream on the right bank to the Neely Bridge Natural Area. A forested buffer along the river continues east from Neely Bridge Natural Area. It also continues downstream through the Hatchery and Auburn Narrows Natural Areas. The buffer thins out considerably after Neely Bridge, yet may provide connectivity for some terrestrial species at least as far as Green River Park Natural Area. Despite the presence of Lake Holm road, there are areas of forested riparian habitat with active channel migration areas extending below Highway 18 to the Auburn city limits.

The Corps’ Environmental Assessment (USACOE 1999) identifies the following vegetation at the site, excluding the native plants installed in 1999 and 2001:

The vegetation on the site is primarily pasture grasses (*Lolium perenne*, *Agropyron repens*, *Dactylis glomerata*, etc), reed canarygrass (*Phalaris arundinacea*) and Himalayan blackberry (*Rubus discolor*) in the upland areas with some recent growth (less than 20 years of age) of [red] alder (*Alnus rubra*), willows (*Salix* sp.) and cattails (*Typha latifolia*) in the riparian and wetland areas. A very few [western red]cedars (*Thuja plicata*) less than 20 years old are on the levee and near the pond as well as a few older [black] cottonwoods (*Populus balsamifera*).

Black cottonwoods exist on the downstream portions of the left bank, and stands of bigleaf maple and Douglas-fir exist on the steep right bank hillside adjoining Lake Holms Road (Levesque pers. comm).

In 1999 King County WLRD sponsored a planting project to fulfill the permit requirements for the 1999 side-channel connection project. Volunteers and a Jobs for the Environment (JFE) crew installed 722 plants: 10 grand fir, 29 sitka spruce, 12 western white pine, 24 douglas fir, 12 western redcedar, 18 bigleaf maple, 27 red alder, 9 black hawthorne, 7 oregon ash, 16 black cottonwood, 7 quaking aspen, 9 western crabapple, 6 cascara, 7 pacific willow, 53 vine maple, 33 red osier dogwood, 40 wetern hazelnut, 53 ocean spray, 26 twinberry, 26 indian plum, 40 red

flowering currant, 40 nootka roose, 33 baldhip rose, 53 thimbleberry, 53 salmonberry, 26 red elderberry, and 53 snowberry.

In fall 2001, the King County Parks Department and WLRD installed 934 trees on 4 acres: 279 black cottonwood, 75 red alder, 80 western-red cedar, 75 Douglas-fir, 275 Sitka spruce, 90 bigleaf maple, and 60 Scouler's willow. To combat invasive species and encourage strength and vigor in these plants, weed fabric skirts and rodent protection tubes were installed around all trees except for the Sitka spruce. Plant selection was limited to trees because previous experience indicated that shrubs fare poorly in environments as heavily infested with invasive vegetation as Porter Levee. The 4 acres planted were the only areas on the left bank of the river that the Corps' geological consultant believed would not likely be permanently overtaken by the Green River if the levee is removed within the next 20 years as planned (Perkins pers. comm.). (Please refer to the Analysis Section for additional information on this project.)

Fish and Wildlife

According to the Green/Duwamish Ecosystem Restoration Study (2000):

The Middle Green River supports populations of coho, chinook, and chum salmon, steelhead, rainbow, and resident and sea-run cut-throat trout. Bull trout have also been found in the Middle Green River sub-watershed, but their use of this portion of the river is not understood. The reach between RM 33.6 to 41.5 is noted to be particularly good chinook spawning habitat.

Sticklebacks were documented in the former pond (now the reconnected side-channel) prior to its reconnection to the Green River in 1999 (Priest pers. comm.). Monitoring of the reconnected side channel from 1999-2001 indicates juvenile salmonid use (Geotz pers. comm.). Baseline studies of amphibians in the side channel prior to reconnection indicated the presence of bullfrogs, northwestern salamanders, long-toed salamanders, and red-legged frogs (Osterhaug 1999).

Other verified wildlife that use the property includes deer, mergansers, great blue herons, beaver and bald eagles. The Wildlife Habitat Network, established in the King County Comprehensive Plan, runs through the Green River Corridor at the Porter Levee Natural Area.

Part 4. Land Use and Infrastructure

This section describes current public use, access opportunities, trails, roads and utilities. Figure 3, Existing Conditions, illustrates the trails and access points at the Porter Levee Natural Area.

Public Use

Porter Levee is used for fishing; however, use appears to be relatively low. Although the site is available for passive recreation activities such as walking and nature observation, King County Park Resource (Park) staff has observed few, if any, visitors engaging in these activities.

In 2001 and 2002, Park staff observed occasional motorcycle and jeep tracks on the property. A stolen vehicle was abandoned at the site in 2002. Dumping occurred along an unimproved road accessed off of Lake Holms Road on the right bank of the river and along Green Valley Road. Park staff worked with King County Roads staff to install large concrete blocks at entry points to reduce vehicle access opportunities. Site inspections indicate that this strategy seems to have reduced, if not eliminated, unauthorized motor vehicle access on the property. However, dumping at the Green River Road access continues to be a problem.

Although hunting is illegal on the site, Park staff reported one encounter with duck hunters. Resource staff has also observed duck carcasses on the property.

Access

Visitors typically access Porter Levee via a pullout adjacent to Green Valley Road with parking for about six vehicles. Part of the pullout is in the road right-of-way, and part is in Porter Levee Natural Area. The pullout has no sign identifying the property, and visitors must cross a stream to access the main part of the property. In summer, the small, unnamed stream is usually low or dry and is easily crossed. In winter, the water depth sometimes limits access.

King County staff typically accesses the property via a break in the fence north of Burr Mosby's farm road. This entrance is the only vehicle access point into the restored areas on the property. Mr. Mosby has given Park staff verbal permission to access Porter Levee via this gated road to conduct maintenance and management activities. Although this access is not formally open to the public, site inspections have revealed that unauthorized motorcycles and other vehicles have accessed Porter Levee via this access by illegally driving through the farm.

Another access point into the property is located off of Lake Holms Road. It is blocked with large concrete blocks to prevent dumping and vehicular access to the part of Porter Levee Natural Area located on the right bank of the Green River.

Trails and Roads

No formal trails exist at Porter Levee. A social trail exists along the levee adjacent to the river. There is an unmaintained road constructed when the Corps installed the 1999 side-channel reconnection project that can be reached from the Green Valley Road access point by foot when the unclassified stream is low. Visitors use this unmaintained road to access the river for fishing. King County staff uses this road to conduct site maintenance and management activities. Another unmaintained road exists on the right bank and is suitable for use as a foot trail for fishing access and other passive recreation activities. It is usually quite muddy in the winter.

Fencing

A broken down barbed-wire fence runs along the south property line.

Utilities

The assessors report indicates that parcel number 2121059001 (former owner Bottemiller) has a well with an electrically driven pump as well as an electrical box. The existence of this well and pump has not been verified.

Part 5. Site Management Chronology

This section chronicles management activities at Porter Levee since 1961. When known, costs associated with these activities are included. (Note: an asterisk (*) in the funding column indicates that Parks Division labor costs are included in an annual figure listed in the table at the end of each year.)

Table 3. Primary management activities associated with the Porter Levee Natural Area.

Date	Action	Associated Costs (if known)
1961-1963	Porter Levee was constructed to prevent a meander of the Green River from migrating west. A 400-meter long oxbow pond was formed when the meander was cut off by the new levee.	
1980s	The Porter Levee was overtopped and a portion washed out in floods. The Corps repaired this levee with King County acting as the contractual local sponsor for ongoing maintenance of the repaired levee system.	
1990	The same portion of Porter Levee was overtopped and washed out during the flood of 1990. King County unit responsible for flood facilities decided against further repairs to the levee system on this site.	
Late 1980s-1998	The prior owner of Porter Levee conducted agricultural activities on the site. Neighboring farmer, Burr Mosby, said that corn was grown on the property in the late 1980s. Other references suggest the site was used as a pasture in previous years. Mr. Mosby said that he disked the property regularly for the previous owner to control weeds.	
1990	The levee failed at the downstream side channel of the property on river left. KC staff members decided not to repair the levee because it was a discontinuous segment that did not provide flood containment. (Levesque pers. comm.)	
1998-1999	KC acquired the Porter Levee Natural Area.	Cost: \$395,000
August-November 1999	The Corps constructed the Porter Levee Section 1135 Restoration Project, which was sponsored by KC. Construction was completed in August 1999 and planting was completed in November. On October 16, the KC Water and Land Resources Division sponsored a volunteer planting event to install native vegetation to improve side channel habitat. Volunteers and a Jobs for the Environment (JFE) crew revegetated approximately 3 acres of Green River and channel/pond habitat. (See the appendix for more details on this project.)	Cost: \$227,000 The costs were calculated on a 75/25 percent shared basis. The Corps contributed 75 percent and King County matched with 25 percent. King County contributed \$74,749 in a combination of real estate costs, in-kind costs and cash contributions.
February/March 2000	Washington Department of Fish and Wildlife (WDFW) staff installed a temporary bridge across the stream on the western side of Porter Levee to access a fish trap (a screw trap) designed to collect juvenile fish. The trap was installed in the Green River near the intersection of Mosby's farm and Porter Levee. KCWLRD staff asked WDFW to remove the bridge after one season to ensure appropriate natural resource protection for the Porter Levee	

Date	Action	Associated Costs (if known)
	property.	
Summer 2000	A JFE crew used machetes and pipes to cut down the blackberries threatening the 1999 planting.	Cost: \$4,000 (4 people, 10 hours a day, 4 days @ \$1,000 a day) JFE grant funds.
	KC's Green River Basin Steward contracted with Gordon Wenger to use a light tractor to cut blackberries threatening the 1999 planting and other blackberry infested areas.	Cost: \$1,500 King Conservation Grant funds
	Park staff controlled blackberries and other invasive plant species at the 1999 planting site.	*
		Year 2000 Park Costs: \$1,035 Invasive weed removal (28 hours x \$20 an hour = \$560); Restoring and maintaining restoration efforts (19 hours x \$25 an hour = \$475)
	WDFW staff removed the temporary bridge. WDFW staff determined that the trap is in a good location and negotiated with the Corps to improve a road through Mr. Mosby's property to access the trap in future years.	
Spring 2001	King County Parks received a grant from the Washington State Department of Natural Resources Community Forestry program for \$10,000 for materials for a restoration effort on four acres at Porter Levee and 1/2 acre at Hatchery Park.	
	King County staff and volunteers grubbed and cut blackberries at the 1999 planting.	In Kind: \$500 (10 volunteers x 4 hours =40 hours. 40 x \$12.50 = \$500)
Summer 2001	The KC Park's crew controlled blackberries and other invasive species using only weed eaters and a brush hog because of KC Department of Development and Environmental Services (DDES) permitting uncertainties. In an attempt to reduce the labor costs associated with hand control, staff covered a 10,000 square foot blackberry area with weed fabric and plastic.	*
	Mr. Mosby informed KC DNR and Park staff that he disked Porter Levee annually prior to KC ownership to keep weed seeds from invading his farm. This information was relayed to DDES staff who then agreed that heavy equipment could be used on the site without a permit because it is a practice that has been employed regularly on the property within the previous five years.	
	KC Parks crew cuts unplanted areas of the property with a tractor and hammerknife.	*
	Volunteers cut blackberries at various locations on the site.	In Kind: \$1,500 (20 people for 6 hours =120 hours; 120 hours x \$12.5 = \$1,500.)
Sept 29 and Oct. 6, 2001	About 60 volunteers planted about 600 of the 1000 trees. Earth Corps crews and King County Park staff distributed plants and supervised volunteers.	Cost: \$18,200 Materials: \$10,000:Earth Corps (4 days x \$1,300 per day) = \$5,200

Date	Action	Associated Costs (if known)
		(WTD grant); in kind volunteer assistance \$3,000 (60 x 4 hours each =240 hours. 240 hours x \$12.5 =\$3,000). *
Fall 2001	Earth Corps and Park staff planted the remaining 400 trees and installed 40 percent of the weed control and rodent protection. Funding for Earth Corps time came from King County Park's capital improvement funds.	Cost: \$8,100 (Nine Earth Corps crew days at \$900 a day = \$8,100.)
		Year 2001 Park Costs: \$17,401 Invasive weed removal (168 hours x \$20 an hour = \$3,360); Restoration/maintenance (562 hours x \$25 an hour = \$14,050).
March 7, 2002	Seven volunteers (Pierce County 4-H ambassadors) and three Park staff flagged 1,000 trees installed in 2001 and installed weed fabric and rodent protection around some of those trees. They also cut blackberries at the 1999 planting.	In Kind: \$350 (28 volunteer hours x \$12.50)
Summer/Fall 2002	KC Park staff worked with KC Roads to install concrete blocks at (1) the Lake Holmes Road to prevent vehicular access and dumping and (2) at the Parking area adjacent to the Green Valley Road to prevent off road vehicles from driving through the stream and accessing the property with vehicles.	
	Earth Corps staff watered the 2001 restoration planting.	Cost: \$400 King Conservation Grant Funds. (This represents only a fraction of this cost. A Wastewater Treatment Division Grant paid approximately \$1,300 a day for watering services. The exact figures are unavailable)
	Park staff controlled weeds around 1999 and 2001 restoration plantings. King County Park's crew mowed invasive species growing between trees planted in 2001 and in open areas.	*
		Year 2002 Park Costs: \$22,430 Invasive weed removal (164 hours x \$20 an hour = \$3,280); restoration /maintenance (766 hours x \$25 an hour = \$19,150)

Part 6. Analysis

In this section, site specific information is integrated with larger landscape conservation considerations and fiscal and political constraints to formulate management recommendations which will be summarized in Part 7.

Species of Concern

Because of the lack of a comprehensive ecological assessment at the Porter Levee Natural Area, the species identified in this document do not account for all species that use the Porter Levee Natural Area for one or more stages of their lifecycles. However, documented evidence of three threatened species listed under the Endangered Species Act, chinook salmon, bull trout, and bald eagle, and the presence of great blue herons, a species of concern in Washington State, make habitat preservation and necessary restoration management priorities at the Porter Levee Natural Area.

Information Gaps

Little biological and ecological information exists on this site. A comprehensive ecological assessment would provide an understanding of the species that use this natural area and a characterization of river habitat forming processes such as channel migration, LWD sources, sediment accumulation, current flood flows, and channel complexity. This information would be useful when evaluating the spectrum of ecological impacts from proposed habitat restoration and management activities in the Middle Green River Reach.

Enhancing Processes, Structure and Function

Conservation theory suggests that the elements of an ecosystem will function properly if the natural processes affecting them are undisturbed. If systems are not functioning properly, then, if possible, the first place to focus habitat improvement activities is on the system-wide processes instead of the affected elements. Due to flow modifications from the operation of Howard Hanson Dam, historic processes cannot be reinstated, and it is possible that modifications to the floodplain may be needed to re-establish functional levels of ongoing floodplain process under the controlled flow regime now present in the Green River system (Levesque pers.comm.)

Training levee removal would be the first restoration activity to consider at this site because the left bank part of the natural area is currently confined by a levee constructed in 1961. When a river is confined by a levee, the river's natural processes, such as meandering and flooding, are curtailed. Meandering allows for gravel transport and large woody debris recruitment, both crucial to the formation of salmonid habitat. Flooding carries nutrient-rich silt and seeds of plants onto the floodplain for the natural regeneration of riparian forests.

Removal and setback of the Porter Levee were recommended in the 1993 King County Flood Hazard Reduction Plan (FHRP). In the Green/Duwamish Ecosystem Restoration Feasibility study, the Corps recommends the Porter Levee Setback project (site Number 25) to restore about 45 acres of floodplain. This proposal suggests:

removing the existing training levee and constructing about 1,800 linear feet of new levee at the toe of Green Valley Road. In addition, a small 200-foot levee would be constructed on the upriver side of the property adjacent to the river to prevent flooding to the neighboring property. This project would allow the Green River to move or meander across the former flood plain, increasing channel length in a highly habitat, improving nutrient export, and increasing base flow and flood storage capacity.

Currently, this project is in a conceptual or preliminary design phase. The Green/Duwamish Ecosystem Restoration Study, a cooperative effort between the U.S. Army Corps of Engineers, local jurisdictions, non-governmental agencies and Indian tribes, was completed in October 2000. Federal funds are currently being sought to fund the construction of Phase I Green/Duwamish Ecosystem Restoration Projects in 2004. Because Porter Levee is not included in Phase I, construction of this project in partnership with the U.S. Army Corps of Engineers may not be undertaken for several years. Extensive hydrologic and biological analysis, engineering and design will be necessary before this potential project is ready for construction (Hanson pers.comm.)

Decisions concerning the modification of the existing levee and the design of future flood facility modifications at the site should be coordinated with the King County Flood Hazard Reduction Services Section (FHRS) and should consider adopted FHRP policies. Removal and setback of the Porter levee may allow future channel migration in this reach. Both the Mosby Brothers farm (an FPP property) and the Green Valley Road should be provided with appropriate levels of erosion protection consistent with adopted county policies and relevant deed restrictions. Channel migration resulting from levee removal should be confined to the Porter Levee site itself. Design options could include buried rock toe buttresses along the property lines, or within the adjoining roadway prisms themselves (including Mosby's access road). Alternatively, LWD emplacements for flow deflection and energy dissipation, or possibly vigorous revegetation in conjunction with some combinations of each of these measures could suffice for such protection as alternatives to new levee construction (Levesque pers.comm.)

The river protection easement potentially encumbering portions of the existing site should be considered in connection with any flood facility modifications. All parties involved in facility modifications should agree on maintenance responsibilities.

Three planning processes are underway that may result in additions or changes to the enhancement recommendations mentioned in this document. King County Stewardship staff is developing the Middle Green River Restoration Blueprint (scheduled for completion in 2005), King County Flood Hazard Reduction Services Section staff is revising the Flood Hazard Reduction Plan and WRIA 9 staff is working on the WRIA 9 Habitat Plan (scheduled for completion in 2005).

Levee Removal Monitoring

The removal of a levee assumes that natural processes will be re-established—the river will flow naturally and the flood plain will be restored. If the levee is set back at Porter Levee, it is possible the river will meander across the site. And if the river does meander, it is possible that one or more islands would be formed that could provide relatively protected habitat for some terrestrial and waterfowl species. At the present time, the overall ecological benefits of this proposed levee setback are unknown.

An appropriately designed, long-term monitoring regime could provide insight about (1) the extent that natural processes were restored, (2) how riverine processes affect the structure and function of the surrounding landscape and the species that inhabit it, and (3) how levee removal affects the river system. The results of this type of monitoring program could influence future decisions about other levee removals and installations.

Restoring Vegetation

King County has implemented an invasive plant control strategy and installed two planting projects at the Porter Levee Natural Area in an effort to improve the ecological structure and

function at the site. Monitoring and maintenance of these sites would help ensure project establishment.

Little opportunity remains to plant native vegetation in areas outside the 2001 planting area because the Green River is likely to migrate into the unplanted areas on the left bank if the Corps levee setback project mentioned above is constructed. Staff might consider the benefits of installing a shrub layer in the area of the 2001 planting when monitoring indicates that the invasive control efforts and native plantings have largely curtailed the invasive species in that area.

King County staff members are attempting to control invasive species such as blackberry, reed canarygrass, thistle, and teasel with a mowing regime designed to discourage flowering, seeding, and vigor of invasive species and encourage competition by native and non-invasive species. In 2000, 2001, and 2002, Park staff mowed the invasive species only once a year because of time constraints. Mowing was done after July 1 to avoid disturbing breeding birds. Increasing the mowing frequency to three times a year would likely expedite invasive species control. As a result of current Sensitive Areas Ordinance permit restrictions, it is important that staff use heavy equipment on this property for invasive control at least once every 5 years to ensure that King County retains its ability to use heavy equipment at this site for invasive control purposes.

Land Use

Although the Porter Levee Natural Area is within the Upper Green River Valley Agricultural Production District, deed and funding source restrictions limit the natural area to habitat and open space uses. Consequently, the property is not suitable for long term agriculture.

Site inspections indicate that Porter Levee Natural Area currently supports low numbers of visitors engaged in recreational activities such as fishing and walking. The current level of use appears to have no adverse effect on the ecological resources of the site. At this time, there appears to be no reason to install visitor support infrastructure at Porter Levee Natural Area. Monitoring for changes in numbers of visitors and types of use will alert land managers to changes to this situation.

Inappropriate public uses on the site have included unauthorized vehicle access, sign vandalism, hunting, littering and dumping. Physical barriers at access points seem to have curtailed most unauthorized motor vehicle access. Currently, the only known access available to unauthorized motor vehicles is illegal entry off of Burr Mosby's road.

Effective signage could support appropriate site use. General park rules signs posted at access points provide the legal notice the sheriff requires in order to cite visitors using Porter Levee in inappropriate ways. "No Motor Vehicles" signs at the access off Mosby's property inform visitors that unauthorized motor vehicle use is illegal on this site. A "pack-it-in, pack-it-home" signage strategy might reduce litter. "No Hunting" signs inform visitors that hunting is illegal. "No Dumping" signs at the Green Valley Road entrance, although probably not extremely helpful in curtailing the frequent dumping at this entrance, provide legal notice useful to law enforcement personnel attempting to arrest violators.

Revenue Generating Opportunities

There are no obvious revenue generating opportunities at the site at this time.

Part 7. Management Goals, Objectives and Recommendations

The objectives and recommendations that follow are derived from the analysis in the previous section. Office of Rural Resource Programs staff will revise the recommendations for the Porter Levee Natural Area when new information from site monitoring programs and other initiatives indicate a need for a change in management strategies.

Goals for Ecological Lands

King County Department of Natural Resource and Parks goals for Ecological Lands are to:

- conserve and enhance the site's ecological value, and
- support appropriate public use that does not harm ecological resources.

The objectives and recommendations that follow are designed to support these goals when practicable at the Porter Levee Natural Area.

Objective: Understand implications of management and restoration actions at the Porter Levee Natural Area

➤ *Recommendation: Fill in Data gaps*

The Science, Monitoring and Data Management section should complete an ecological assessment to gain a more thorough understanding of the ecological characteristics of the area. This should include species use. (Schedule: 2005)

➤ *Recommendation: Coordinate site enhancement opportunities*

King County Natural Resource Lands (NRL), Land and Watershed Stewardship (LAWS), Flood Hazard Reduction Services (FHRS), Corps, and WRIA 9 staff should coordinate to ensure that any recommendations for Porter Levee Natural Area presented in the Middle Green River Restoration Blueprint, the Flood Hazard Reduction Plan, the WRIA 9 Habitat Plan, and the Ecosystem Restoration Project are coordinated and maximize the ecological potential for the site. (Schedule: 2004-2008).

Objective: Allow the Green River to flow naturally at the property

➤ *Recommendation: Consider Levee Setback*

The Green River Basin Steward, the King County/Corps partnership manager, Flood Hazard Reduction Services staff, and Science, Monitoring and Data Management Section staff should continue conversations with the Corps regarding implementation of the Porter Levee Setback project. Staff should coordinate with the Corps prior to and during the project design phase to define the monitoring strategies for the project and ensure that necessary baseline data is collected prior to levee setback. Staff should also determine the nature of future maintenance requirements for any future flood facility modifications at the site and clearly identify who is responsible for any maintenance activities.

If Corps funding is not appropriated for this project, King County should explore other funding options. (Schedule: 2005)

Recommendation: Resolve river facility maintenance uncertainties

The Flood Hazard Reduction Services Section should clearly evaluate and define their intentions for the maintenance of the facility at Porter Levee and resolve uncertainties associated with the possible dissolution of the 1961 River Protection Easement encumbering portions of the site due to the acquisition of the property in fee by the county. (Schedule: 2004)

Objective: Establish native vegetation

➤ *Recommendation: Control and Monitor Invasive Vegetation*

Park staff should manage the noxious and invasive plant species that infest a large portion of the Porter Levee. (Schedule: annually).

Park staff should continue with the current strategy to control these species with a mowing regime. The mowing frequency should be three times a year until monitoring indicates success. The first mowing should occur after July 1 to avoid disturbing breeding birds on site. Staff should use an Integrated Pest Management to adapt the control methods as necessary. (Schedule: 2003-2006)

King County staff should maintain excellent relations with neighbor Burr Mosby. Mr. Mosby allows King County staff to access Porter Levee via his road. There is no other vehicular access to the Porter Levee restoration areas.

➤ *Recommendation: Maintain and Monitor Revegetation Projects*

King County Park staff and other crews as contracted should cut blackberries three to five times a year at the 1999 planting site. These blackberries have been cut three to five times a year in 2000, 2001, and 2002. Staff will implement this practice (or other control methods as monitoring data suggest) until the blackberries and other invasive species are controlled in the 1999 restoration site. (Schedule: 2003-2006)

Park staff should evaluate removing weed fabric and rodent protection from around the trees installed in 2001 when monitoring indicates that the trees will prosper without these protection mechanisms. Original estimates were that the fabric would need to remain at least 5 years. (Schedule: 2006)

Park staff should remove support stakes from the 2001 trees in fall 2003. (Schedule: 2003)

Park staff should monitor the 2001 plants four times a year through December 31, 2004. This is a requirement of the Washington State Urban Forestry Grant used to fund material for the project. Three of the monitoring events during a given year are quick visual assessments. The fourth, usually conducted in August or September, involves individual tree counts and notes on survival and health. The goal is 80 percent survival, although the County is not legally required to achieve this standard. (Schedule: 4 x a year in 2003 and 2004)

➤ *Recommendation: Consider Future Revegetation Project*

King County staff should consider installing a shrub layer in the area of the 2001 planting when monitoring indicates that the mowing regime and native plantings have largely controlled the invasive species. (Schedule: 2006)

Objective: Allow current level of passive recreation opportunities such as fishing, nature observation, and walking at Porter Levee

➤ *Recommendation: Monitor public access*

Park staff should note changes in visitor numbers and types of recreational activities at Porter Levee and record noticeable visitor impacts on the ecological values of the site. This information should be reported annually to King County Natural Resource Lands Management Staff responsible for updating site management guidelines. (Schedule: monthly)

Objective: Protect the site from inappropriate public uses

➤ *Recommendation: Implement Preserve and Protect Measures*

Park staff should recommend, install, and maintain any necessary capital improvements to protect the site from inappropriate public uses. This could include bollards, signs, concrete blocks, and boundary markers. (Schedule: as needed)

Park staff should install and maintain a “rules” sign, a “no motor vehicles” sign, and a “no hunting” sign at the access off Burr Mosby’s road, the access beside Green Valley Road, and the access off of Lake Holms Road. The signs should be placed on the east of the stream at the Green Valley parking area access. (Schedule: summer 2003)

Park staff should explore installing “Pack-it-in, Pack-it-home” signs on this property if litter activity increases. (Schedule: as needed)

➤ *Recommendation: Control Litter/Dumping and Encroachment Activities*

Park staff should inspect and monitor the site monthly for encroachment, dumping, and other trash and respond as necessary to maintain a clean and safe property. (Schedule: monthly)

Park staff should remove the dumped materials on the abandoned road leading off of the Lake Holms Road access. (Schedule: summer 2003)

Objective: Implement site management guidelines recommendations

➤ *Recommendation: Site Maintenance Plan Creation*

Park Resource staff should coordinate with the basin steward to prepare a site maintenance plan (a work plan) to include the litter/dumping, inspection, restoration monitoring and maintenance, and invasive control tasks identified in the recommendations. NRL staff should coordinate with Park Resource staff on this effort. (Schedule: annually).

➤ *Recommendation: Coordinate Recommendation Implementation*

NRL staff should monitor the recommendations in the site management guidelines and coordinate with the various programs responsible for implementing these recommendations to facilitate their timely accomplishment. (Schedule: ongoing).

NRL staff should coordinate with the Green River Basin Steward and Park Resource staff to revise the site management guidelines. (Schedule: as needed or 2008).

Table 4. Porter Levee Natural Area Recommendations: budget, schedule and staff matrix

Recommendations	Cost	schedule	Park Resource Staff	GR Basin Steward	WRIA 9 Project Coord.	WEAT	US Army Corps	KC/Corp Partnership Mgr	NRL staff	WRIA 9 Technical Team	Flood Hazard Reduction Services
Priority One											
create site maintenance plan		annually	x	x					x		
inspect site/litter removal/visitation monitoring/other preserve and protect actions		monthly	x								
remove dumped materials		as needed	x								
remove dumped materials off Lake Holm Road access		summer 2003	x								
remove stakes from trees planted in 2000		2003	x								
monitor 2000 planting 4x a year		2003 and 2004	x								
evaluate removing weed fabric around 2000 trees		2006	x								
cut blackberries 3-5 x a year at 1999 planting site		2003 thru 2006	x								
mow unplanted areas 3 x year		2003 thru 2006	x								
update site management guidelines		as needed or 2008	x	x					x		
Monitor and coordinate smg recommendation implementation		ongoing							x		
Priority Two											
complete ecological assessment		2005				x					
coordinate site enhancement opportunities		2004-2008		x			x		x	x	x
continue levee setback evaluations with the Corp		2004-2005		x	x		x	x	x	x	x
seek other funding if needed for levee setback		2006		x							x
resolve river facility maintenance uncertainties		2004		x					x		x
consider installing shrub layer at 2001 enhancement		2006	x	x					x		

Appendix: 1999 Porter Levee Section 1135 Restoration Project

The Corps/King County sponsored Green/Duwamish River Ecosystem Restoration Study identified the Porter Levee Natural Area as a prime location for an “early action” project (for implementation under authority of Section 1135 of the Water Resources Development Act) to provide off-channel rearing and winter refuge habitat for juvenile salmon (chinook, coho, steelhead and chum). Construction was completed in August 1999.

The project included breaching a levee in two places to provide flushing flows into an 8-acre relic river channel/pond to increase fish habitat and improve water quality. (Since the installation of the levee, this channel/pond had no connection to the river except during flood flows.) Flows above 1,500 cfs flow through the upstream notch in the levee, typically from November through May. Flows above 400 cfs flow through the downstream notch to provide access for juvenile salmon from approximately October through July. Large woody debris was placed in the pond and at the outlet channel to provide additional salmon habitat. (Kahan pers.comm.).

In November 1999, the King County Water and Land Resources Division sponsored a volunteer planting event to install native vegetation to improve side channel habitat. Volunteers and a Jobs for the Environment (JFE) crew installed 735 plants: 87 conifers, 106 deciduous trees, and 542 shrubs. Approximately three acres of Green River and channel/pond habitat were revegetated.

King County received two grants for construction and maintenance of this project. A King Conservation District grant for \$40,000 was awarded in 1999. (A small balance remains for maintenance of the restoration efforts at the Porter Levee Natural Area.) A second grant of \$40,000, awarded by the Washington State Office of the Interagency Committee for Outdoor Recreation on behalf of the Salmon Recovery Funding Board, was a primary source of the King County construction match funds (Hanson pers. comm.).

References:

- Elliott Bay/Duwamish Restoration Program. 2000. Intertidal Habitat Projects Monitoring Program, Panel Publication 23.
- Osterhaug, K. 1999. Porter Levee Baseline Amphibian Sampling Report. King County Department of Natural Resources, Water and Land Resources Division, Seattle, WA.
- King County. 1989. King County Open Space Bond Issue, Seattle, WA.
- King County. 1999. Draft Porter Levee Monitoring Plan. King County Department of Natural Resources and Parks, Water and Land Resources Division, Seattle, WA.
- King County. 2003a. King County Water and Land Resources Ecological Lands Handbook, King County Department of Natural Resources and Parks, Water and Land Resources Division, Seattle, WA.
- King County. 2003b. Middle Green River Reach. King County Department of Natural Resources and Parks, Water and Land Resources, Seattle, WA.
- U.S. Army Corps of Engineers (USACOE). 1999. Environmental Assessment, Porter Levee. Section 1135 Restoration Project, Seattle, WA.
- U.S. Army Corps of Engineers (USACOE). 2000. Green-Duwamish River Ecosystem Restoration Draft Feasibility Report. Seattle, WA.
- U.S. Army Corps of Engineers (USACOE). 2000a. US Army Corps of Engineers Draft Programmatic Environmental Impact Statement and Draft Restoration Plan - Green/Duwamish River Basin Restoration Program. Seattle, WA.
- U.S. Department of Agriculture, Soil Conservation Service. 1973. Soil Survey, King County Area, WA.
- Personal Communications:**
- Falcone, Perry. 2002. Program/Project Manager, King County Department of Natural Resources and Parks, Seattle, WA.
- Goetz, Fred. 2002. Biologist, US Army Corps of Engineers, Seattle, WA.
- Hanson, Linda. 2002. Former Green River Basin Steward, King County Department of Natural Resources and Parks, Seattle, WA.
- Kahan, Josh. 2002. Green River Basin Steward, King County Department of Natural Resources and Parks, Seattle, WA.
- Levesque, Andy, 2002. Senior Engineer, Rivers Section, King County Department of Natural Resources and Parks, Seattle, WA.
- Mosby, Burr. 2001. Farmer, Mosby Brothers Farms. Sumner, WA.
- Perkins, Sue. 2001. Perkins Geosciences, Seattle, WA.
- Priest, Bill. 2003. Ecologist, King County Department of Natural Resources and Parks, Seattle, WA.