Wetland 79 Natural Area
Site Management Guidelines

December 2004

King County
Department of Natural Resources and Parks
Water and Land Resources Division

Wetland 79 Natural Area
Site Management Guidelines

December 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

Wetland 79 Natural Area Site Management Guidelines Summary

Site Description

Wetland 79 Natural Area is a King County Department of Natural Resources and Parks (DNRP) Ecological Land. Ecological Lands are managed for the protection of their ecological value, with appropriate public access.

Wetland 79 Natural Area consists of a single parcel nearly 7 acres in size, acquired in 1998. The property is located near the Rock Creek Valley area of the Lower Cedar River basin, located at approximately River Mile 18.0 on the left bank (facing downstream) of the Cedar River. The parcel is 1/10 mile east of the Maple Valley incorporated area and the urban growth boundary. The parcel is located in a topographic low point bounded to the north and west by hillsides sloping down into the wetland, and to the east by the Cedar River Trail which runs along the elevated railroad embankment on the eastern boundary of the site.

Wetland 79 is a former channel of the Cedar River. Construction of the Burlington Northern railroad embankment in the 1930s shifted the alignment of the Cedar River to the northeast. Wetland 79 is connected to the river by a culvert under the railroad bed. Wetland 79 is similar to a naturally formed oxbow: a crescent-shaped body of water located in an abandoned river channel, which may have intermittent connection to the main channel. This site may be the last remaining oxbow wetland still connected to the Cedar River.

The canopy at Wetland 79 is dominated by red alder, big-leaf maple, and western red cedar. The shrub layer is primarily salmonberry, Indian plum, snowberry, ninebark, red elderberry, and vine maple, with a component of non-native Himalayan blackberry throughout portions of the site.

Monitoring reports for King County projects have documented fish and wildlife use of the site. Spawning sockeye, and juvenile coho salmon, and cutthroat trout have been observed at the site in monitoring visits; steelhead trout are listed as present in the Current and Future Conditions Report.

Several capital projects have been performed at the site. The outlet culvert was improved to address blockage and fish passage problems in 1996. Restoration work in 1999 and 2000 connected the wetland to a small spring-fed pond on the neighboring property to the south, enlarged salmonid spawning areas, removed silt and fill from the wetland; added woody debris, and planted the new channel, wetland, and buffer. Currently invasive species are controlled around the plantings, but there is no further control of vegetation. Project monitoring and maintenance is required through 2006.

Public Use

The site is used for walking and nature observation, primarily by local residents and users of the Cedar River Trail. A gate at SE 248th St prevents vehicle passage into the site. The entrance is a narrow, approximately 700-foot driveway off of SE 248th St paralleling the Cedar River Trail. This driveway and associated former roadway within the site represents the main area of use. A few informal trails leading to other parts of the site receive a limited amount of use, and dense vegetation restricts access to many areas along the water.

An interpretive sign written by WLRD Capital Projects group is posted at the north end of the driveway. The sign discusses species presence, restoration project work, habitat function, and project funding.

Management Objectives and Recommendations

The goals for all King County Ecological Lands are to conserve and enhance ecological value, and accommodate appropriate public use that does not harm the ecological resources on site. The following are management recommendations that are designed to support these goals. Text follows each recommendation explaining how that recommendation applies at the site.

Objective: Maintain ecological integrity of the site

Recommendation: Ensure that management and public access support the regional ecological value of site

Decisions about site management and public access should consider the site's functions as a remnant oxbow wetland to the Cedar River, and the significant investment that has been made in habitat restoration. Public use at the site consists of walking and nature observation on the main access road/trail into the site. Use of other areas may occur, so long as this use does not negatively impact the site through impacts to site resources. This overarching recommendation is carried out through the various recommendations below.

Objective: Develop long term ecologically based protection and restoration actions

Recommendation: Evaluate recommendations for site restoration as they are developed

At this time, no further projects are planned for the site. When proposals are put forward for habitat enhancement projects (whether developed by the Natural Resource Lands group, other King County groups, or others outside the County) evaluate the proposals for their impacts on the ecological processes, structure, and functions at the site. An ecological assessment of this site may precede project proposals. Projects should meet the purpose and goals of sites identified as King County Ecological Lands.

As projects on the Natural Area are prioritized and funded by King County groups outside of the Natural Resource Lands group (or by other implementing agencies), projects should be reviewed by NRL through the "Application to Alter Parks Division and NRL Managed Properties" process to coordinate site management with project work.

Objective: Contain spread of invasive vegetation

Recommendation: Monitor and control invasive vegetation

Park staff should contain and, where possible, to reduce invasive, non-native species as time and budget permit. While CPOSA has responsibility for invasive species management around plantings through 2006, if funding is available future Parks staff could continue this effort in areas where planting and weed control projects have already occurred. Control is primarily through manual removal of plants by Park staff.

Recommendation: Monitor and maintain restoration project

King County CPOSA staff will perform monitoring for permit conditions, to ensure 80% survival of plants. Plantings are be observed for plant survival, and re-planted where die-off has occurred. Through the required monitoring and maintenance period (2006) CPOSA staff should arrange for maintenance of restoration project, such as control of invasive species around plantings.

Objective: Protect the site from inappropriate public uses

Recommendation: Control litter/dumping and encroachment activities

Park staff should monitor the site for encroachment, dumping, and other trash and respond as necessary to maintain a clean and safe property. Monitoring should occur at least monthly. Occasional trails from the Cedar River Trail to the site are discouraged due to problems with erosion and safety. These trails would be blocked by Parks staff when observed. If damage to the interpretive sign occurs, NRL will need to determine whether sign will be replaced.

Objective: Allow current level of passive recreation opportunities at the sites

Recommendation: Monitor public access

As noted in the first recommendation, public use at the site consists of walking and nature observation on the main access road/trail into the site. Use of other areas may occur, so long as this use does not negatively impact the site (e.g. impacts to vegetation/wetland or soil erosion).

Park staff should note changes in visitor numbers and types of recreational activities at these sites, and observe any 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.

Table of Contents

List of Tables

List of Figures

Acknowledgements

Contributors:

Ingrid Lundin, Natural Resource Planner, Natural Resource Lands Management Program, King County Department of Natural Resources and Parks (DNRP)

Anne Bikle, Cedar River Basin Steward, Land and Water Stewardship Services, King County DNRP

Don Harig, Resource Coordinator, Parks and Recreation Division, King County DNRP

Jon Hansen, Ecologist, Capital Projects and Open Space Acquisitions Section, King County DNRP

Fauna Nopp, Landscape Architect, Capital Projects and Open Space Acquisitions Section, King County DNRP

Report produced by:

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. Wetland 79 Natural Area Site Management Guidelines. King County Department of Natural Resources and Parks, Water and Land Resources Division. Seattle, Washington.

Wetland 79 Natural Area Site Management Guidelines

Introduction

Wetland 79 Natural Area is a King County Department of Natural Resources and Parks (DNRP) Ecological Land. Ecological Lands are a category of Water and Land Resources 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 and acquisition information, a description of existing site conditions, a chronology of recent events and management actions, and a list of management objectives and recommendations for Wetland 79 Natural Area. These site management guidelines were developed using guidance established in the *King County Water and Land Resources Division Ecological Lands Handbook* (King County 2003a).

Part 1. General Property Information

Wetland 79 Natural Area consists of a single parcel that is nearly 7 acres in size. The property is located near the Rock Creek Valley area of the Lower Cedar River basin. The site is located at approximately River Mile 18.0 on the left bank (facing downstream) of the Cedar River. [1] See Figure 1 for a vicinity map and Figure 2 for a site map. Table 1 provides general information about the location of the Natural Area. Table 2 provides specific information for the parcel.

The parcel is 1/10 mile east of the Maple Valley incorporated area and the urban growth boundary, which runs along the SE Cedar River Pipeline Road in this vicinity. Within the urban growth boundary, residential lots are developed at a density of approximately six to ten houses per acre. In the immediate surroundings of Wetland 79, parcels are zoned at a density of one home per five acres; many parcels are much larger than that size and are largely undeveloped.

The Cedar River Trail runs along the eastern boundary of the site. The Wetland 79 parcel has a narrow, approximately 700-foot driveway off of SE 248th St paralleling the Cedar River Trail. The property adjacent to the driveway (just south of Wetland 79) has a house at 24206 SE 248th St.

There are several other King County Ecological Lands in the vicinity: directly across the Cedar River from the site is BN Peninsula Natural Area; Rock Creek Natural Area lies just south and east of the site; Dorre Don Reach Natural Area lies approximately one mile downstream along the Cedar River; Big Bend Natural Area lies approximately 1½ miles upstream.. The Maple Ridge Highlands Open Space, a multi-use King County Park, lies approximately one mile to the southeast. King County Property Services owns a small lot at the northwest corner of the site, parcel 2222069103, at which there is no public access (see Figure 2).

Table 1. Wetland 79 Natural Area General Information.

Best Available Address	Former house address 24230 SE 248th St
Thomas Guide Map Location	p. 718, C3
Legal Description	Section 22, Township 22N, Range 6E
Acreage	6.67 Acres
Drainage Basin	Lower Cedar River
WRIA	8
Council District	12
King County Sensitive Areas	Wetland, landslide, seismic, erosion, stream.

[1] River miles depicted in the Lower Cedar River Basin and Nonpoint Pollution Action Plan are used in this report; actual river miles may be somewhat different due to improved technology in measurements.

Table 2. Wetland 79 Natural Area Parcel Information.

Parcel Number	Acreage*	Purchase Date	Ownership type/price	Previous Names	Zoning	Funding Source	Recording Number
2222069005	6.67 Ac	11/12/98	Owned in Fee; $291,079	Heath	RA-5	Cedar River Legacy	199811121286

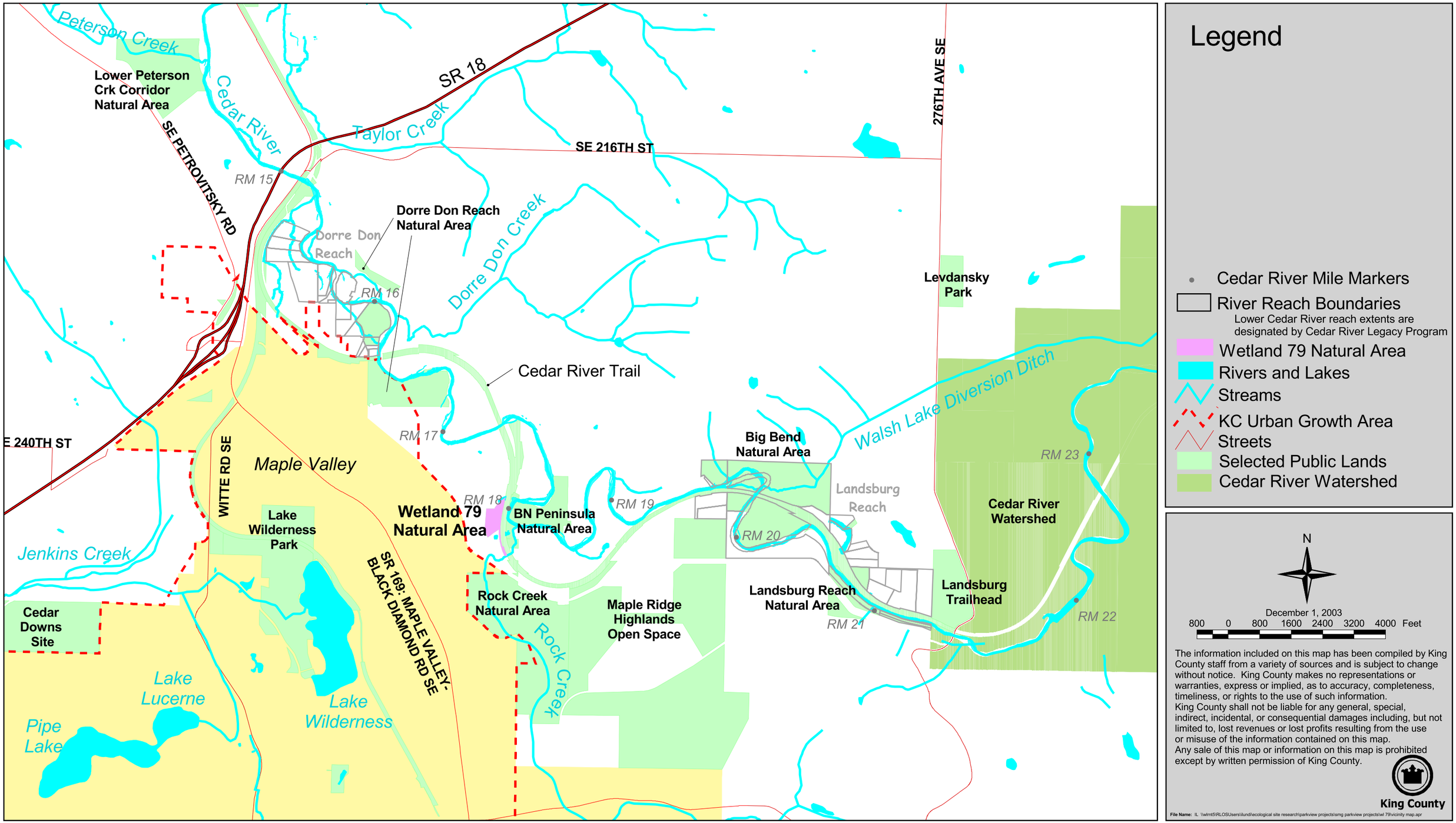
*acreage from King County Assessor's data.

Part 2. Acquisition History, Funding Source and Deed Restrictions

Funding Source

This property was purchased as part of the Cedar River Legacy program. The parcel contains the following text in the Statutory Warranty Deed: "The property herein conveyed is subject to open space use restrictions and restrictions on alienation as specified in RCW 84.34.200, et seq., and King County Ordinance No. 9071, 10750, 11068, and 11713." These restrictions refer to the following documents:

- Ordinance 9071 (July 27, 1989) authorized a public vote on 1989 Open Space Bonds. King County voters approved the $117,640,000 King County Open Space Bond initiative 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. Restrictions on conversion associated with Open Space Bond funds are identified in Section 8, part D.
- Ordinance 10750 and 11068 (March 8 and October 3, 1993) authorized the Regional Conservation Futures 1993 Bond Acquisition Program for King County (per regulations in RCW 84.34.200). A county may place a Conservation Futures Tax (CFT) levy upon all taxable property in its jurisdiction, with revenues directed to acquire open space land or rights to future development within that county (these development rights are termed "conservation futures"). King County CFT acquisition criteria include: wildlife, salmonid, or rare plant habitat value; scenic resource, community separator, greenbelt, or general park and open space value; or historic and cultural resources. Additional consideration is given to passive recreation/interpretive opportunity, threat of loss, complexity of acquisition, public-private partnership, regional significance, relationship of proposed acquisition to existing parks, trails, or greenway systems or plans, and short-term and long-term stewardship commitment at the site (KCC 26.12.025). Purchases made with Conservation Futures funds are to be used for low-impact, passive-use recreation. Motorized use is limited to parking/staging/maintenance areas. "Non-vegetative impervious surfaces" should cover less than 15% of the site (CFT 2002). Conservation futures interests shall not be transferred except with agreement that land interests shall be preserved in accordance with the intent and language of RCW 84.34.230; uses of lands shall not be altered unless equivalent lands within the geographic jurisdiction are provided. (KC Ordinance 10750, p. 10)
- Ordinance 11713 (February 15, 1995) refers to an allocation of Waterways 2000 funds to acquisition and stewardship. There are no explicit restrictions contained in the ordinance. The Waterways 2000 program was approved by the King County Council in 1993 to establish a system of interlocking greenways in six priority basins (Bear Creek, Lower Cedar River, Griffin Creek, Patterson Creek, Middle Green River, and Middle Fork Snoqualmie River). These greenways were protected through a



Legend

- Cedar River Mile Markers
- River Reach Boundaries
  Lower Cedar River reach extents are designated by Cedar River Legacy Program
- Wetland 79 Natural Area
- Rivers and Lakes
- Streams
- KC Urban Growth Area
- Streets
- Selected Public Lands
- Cedar River Watershed

N

December 1, 2003

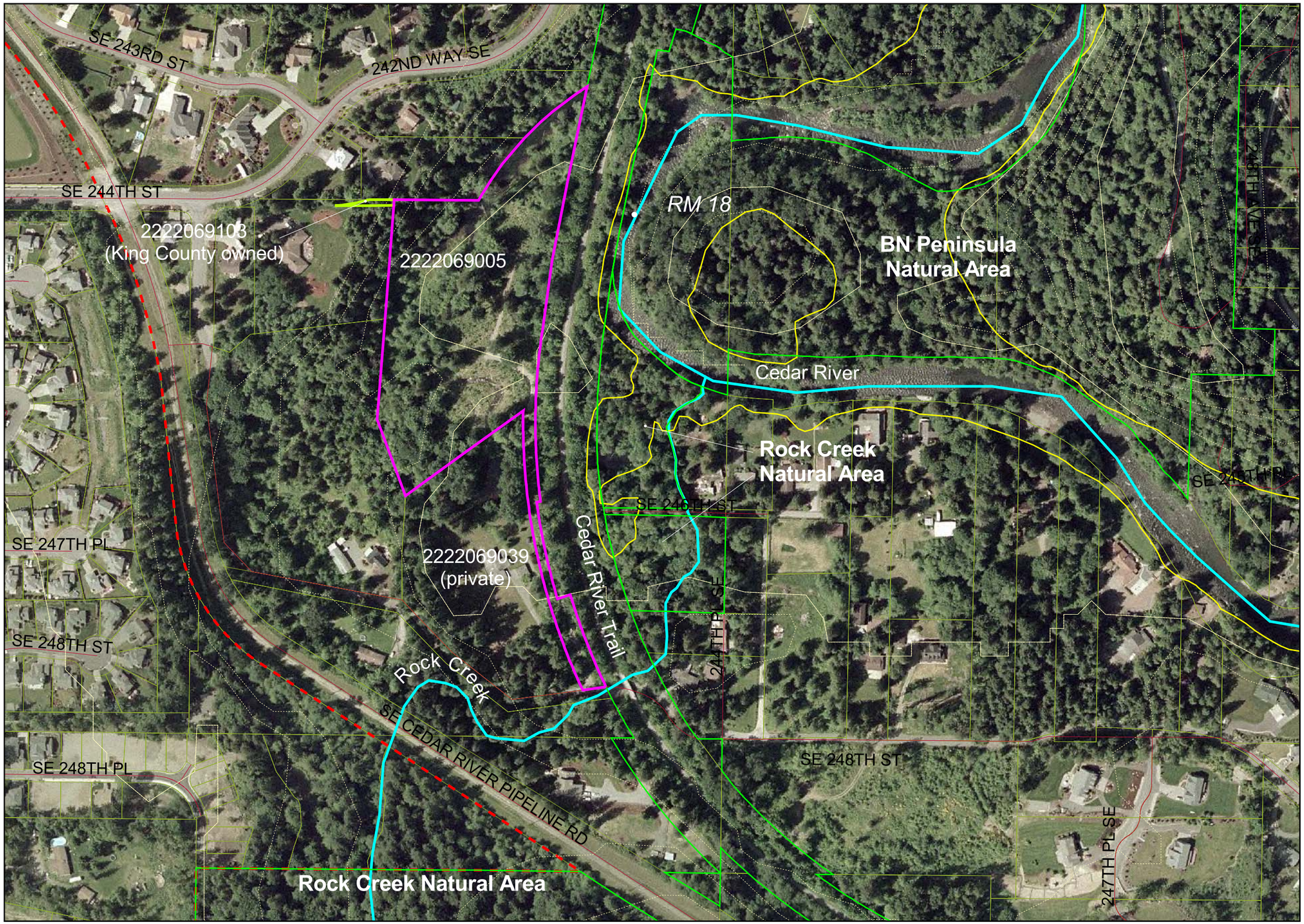
800 0 800 1600 2400 3200 4000 Feet

King County

File Name: IL \\wlrnt5\RLOS\Users\ilund\ecological site research\parkview projects\smg parkview projects\wl 79\vicinity map.apr

Figure 1

Wetland 79 Natural Area: Vicinity Map



Legend

- 100 ft Contour Lines
- 20 ft Contour Lines
- Cedar River Mile Marker
- Streams
- Wetland 79
- King County Trail, Natural Areas
- Floodplains - 100 year
- KC Urban Growth Area
- Streets
- King County Tax Parcels

N

December 4, 2003

100 0 100 200 300 400 500 Feet

Note: Stream, topographic, and 100 year floodplain layers area approximate. Aerial photos from 2000.

King County

File Name: IL \\wlrnt5\rlos\NR Land Mgmt\asmg parkview projects\wl 79\fig 3.apr

Figure 2

Wetland 79 Natural Area Vicinity: Parcel Numbers, Topographic and Hydrologic Features

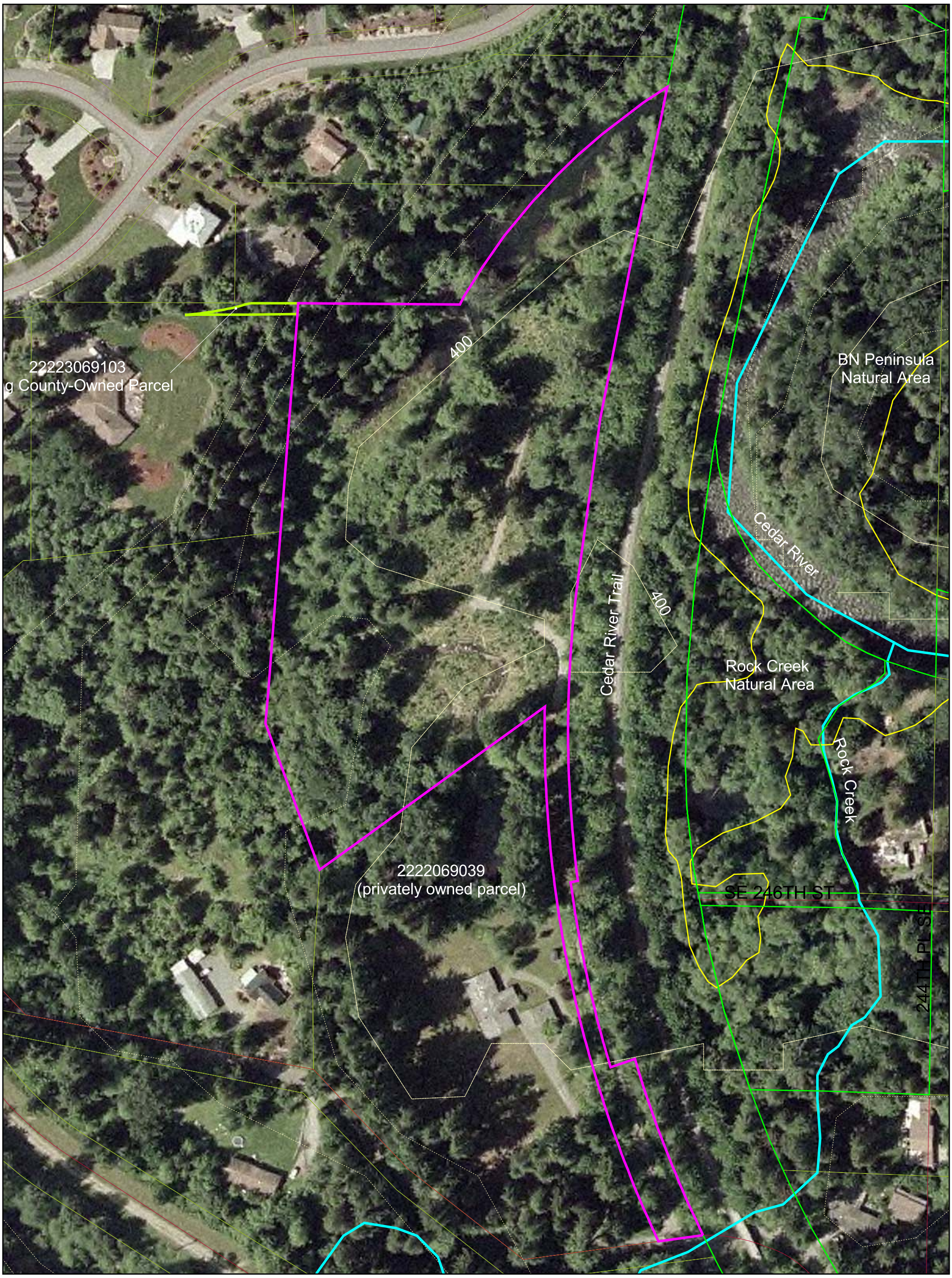


Figure 3

Wetland 79 Natural Area: Site Features

N

November 15, 2004

40 0 40 80 120 160 200 Feet

King County

File Name: IL \\wlrnt5\rlos\nr land mgmt\ingrid arcview projects\smg parkview projects\wetland 79\wetland79.apr

Legend

- Wetland 79
- Parks
- King County-Owned parcel
- Floodplains - 100 year
- Streams
- 100 ft Contour lines
- 20 ft Contour Lines
- Streets
- King County Tax Parcels

variety of measures: acquisition, conservation easements and Public Benefit Rating System (PBRS). The King County Waterways 2000 properties are to provide major recreational opportunities, protect high quality habitat lands, safeguard critical scenic resources, preserve properties of cultural and historic importance and help preserve major fish runs (King County Motion 9175). Conserving threatened high quality biological systems is the program's primary objective (King County Motion 9175, Appendix A: Program vision, objectives and workplan). King County Council appropriated acquisition funds for Waterways 2000 properties through the pooling several funding sources (i.e. 1989 Open Space Bond, CFT and REET funds). These funds are restricted to open space acquisition only (CFT), park and open space acquisition only (REET) and open space capital purposes only (1989 Bond funds) (1995, Waterways 2000 Acquisition and Stewardship Recommendations).

Easements and Conditions

Prior to acquisition, the site was the subject of a "Drainage and Wetland Enhancement Easement" granted in 1995 to King County to perform restoration work (Recording #199510201055). This easement is no longer relevant now that King County owns this parcel and project work has been completed.

Additional easements include an underground utility easement (Puget Sound Power & Light, 7/20/87, Recording # 198707200606; location of easement not available on title documents) and reserved mineral rights.

Part 3. Ecological and Physical Setting

This section describes the existing natural resources and ecological processes associated with the Wetland 79 Natural Area. Additional analysis is presented in Part 6 below. Figure 2 and Figure 3 depict site features including topography, streams, wetlands, and 100-year floodplain.

Topography and Soils

The Cedar River valley in the vicinity of Wetland 79 Natural Area is approximately ¼ mile wide. The Cedar River makes pronounced meanders through this area, flowing against steep slopes on the right bank from about one mile upstream to one mile downstream of the site (part of this distance flowing along BN Peninsula Natural Area).

The Current and Future Conditions Report describes this reach of the Cedar River between RM 17 and RM 21.7 at Landsburg as follows (Wetland 79 Natural Area is located at approximately RM 18):

> "This historically stable reach flows through a narrow floodplain that is constrained in many places by cliffs composed of glacial sediments. No lateral migration could be detected [between 1936 and 1989] although the cliffs are probably retreating slowly at some slide areas at the outside banks of bends. Bank erosion of floodplain deposits has prompted installation of revetments in some locations, most notably from RM 18.4-18.6" (King County 1993, p. 5-29, -30)

In the vicinity of Wetland 79, the left bank slopes are generally less steep than the right bank slopes around the river meander bends, although the Cedar River Trail/railroad embankment limits the westward movement of the river at this site.

In the 1930s, the Burlington Northern Railroad constructed a raised railroad bed in the current location of the Cedar River Trail. The alignment of the Cedar River was shifted to the north and east by this construction (EPA 2001). The railroad grade cut off the Cedar River from a former side channel; Wetland 79 is in the location of this former side channel. The railroad grade still exists and is used for the Cedar River Trail, which runs north-south on the eastern end of the Natural Area.

The parcel is located in a topographic low point bounded to the north and west by hillsides sloping down into the wetland, and to the east by the trail embankment (see Figure 3).

Soils

The King County soil survey maps the following soils at Wetland 79 (Snyder et al. 1973).

- The lower elevations of the site are mapped as Everett gravelly sandy loam, 0-5% slopes (EvB). Everett series are somewhat excessively drained soils underlain by very gravelly sand, that formed in very gravelly glacial outwash deposits under conifers. They are located on terraces and terrace fronts. Permeability is rapid.
- The soils on the slopes above the wetland consist of Alderwood gravelly sandy loam (AkF), very steep slopes (25-75%). Runoff is rapid to very rapid; erosion hazard is severe to very severe; slippage potential is severe. Alderwood soils are moderately well-drained soils located at upland sites, formed under conifers in glacier deposits.

Hydrology and Channel Morphology

Cedar River Mainstem

Using maps and aerial photographs, Perkins described historic changes in channel characteristics between the reach extending from RM 17.0 and RM 21.7 (King County 1993a; also Perkins 1994). This reach was identified based on channel morphology and slope. The Cedar River Current and Future Conditions Report (King County 1993a) described this reach as being historically stable with a narrow floodplain constrained in many places by cliffs of glacial sediments.

Perkins noted that the 1895 active channel width was 180 feet, and in 1989 the active channel width was only 90 feet. She also characterized the natural degree of confinement as "moderately confined," and characterized the current level of hydrological modifications as "moderate." The wetted channel width has decreased from a maximum 143 feet and minimum 77 feet in 1895 to a maximum 99 feet and minimum 82.5 feet in 1989. During this same period, historic pool frequency has decreased from "high" to "moderate." (Perkins 1994, Blair 2003)

The mapped FEMA 100-year floodplain for the Cedar River indicates areas expected to be inundated during the estimated 100-year flood event. (The 100-year floodplain and stream as depicted on Figure 2 are approximate locations only, due to limited accuracy of GIS data layers.) The mapped floodplain of the Cedar River does not extend into the site.

As noted above in the "Topography" section, the construction of the railroad grade limited the westward movement of the Cedar River, and cut off a former side channel (and associated floodplain) from its historic location.

Cedar River Tributaries

Rock Creek (WRIA #08.0339) is the only tributary in the vicinity. The Class 2 salmonid-bearing stream is tributary to the Cedar River just east of the Cedar River Trail from Wetland 79. The Current and Future Conditions Report describes Rock Creek as outstanding habitat for most of its length, used by all species of salmonids.

> "[The limited level of disturbance] contributes to a stable, diverse habitat even in the higher-gradient reaches. Natural system stability is enhanced by a relatively low gradient, a storm hydrology dampened by large amounts of glacial outwash soils, and a series of uninventoried riparian wetlands between RM 2.6 and 0.8…Much of the riparian vegetation, which has a high proportion of coniferous trees, is approaching old growth in size and structural complexity. Most of the stream has high volumes of LWD." (King County 1993, p. 7-73)

Rock Creek is channeled beneath SE 248th Street in a culvert (at RM 0.2). Flooding occurred in 1996 when the creek, which is higher in elevation than the Wetland 79 diverted out of its culvert at the road (Greenleaf 1998, p. 6) Although Rock Creek flowed overland into Wetland 79 during these floods, this was an exceptional event and there is normally no surface water connection between Wetland 79 and Rock Creek. A 2003 King County Roads project installed a 26-foot wide, three-sided concrete box culvert under SE 248th Street, replacing the existing 100-year old, 5-foot wide culvert (King County 2003b and 2003c). The project also involved streambank and instream restoration, replacement of the Cedar River Trail trestle over 248th, and rebuilding of SE 248th Street in the vicinity.

Wetlands

Although a product of railroad grade construction rather than a naturally formed feature, Wetland 79 replicates a naturally formed oxbow: a crescent-shaped body of water located in an abandoned river channel, which may have intermittent connection to the main channel. Project documents indicate that this is the last remaining oxbow wetland still connected to the Cedar River (King County 1998b, King County 2001).

Wetland 79 has hydrologic connection to the Cedar River through a culvert beneath the railroad embankment located at the north end of the wetland. The steep hillsides to the north and west contribute surface water drainage to the wetland. (See Figure 4 for 1999 photo of oxbow wetland).

A report on restoration work at the site (EPA 2001) indicates that "the oxbow had been naturally silting in since it was formed; siltation began to accelerate in the past few decades because of human activities. Livestock had access to the wetland, eroding wetland banks."

The upland portion of the site (in the east and central parts of the parcel) is approximately 3 feet above the surface water level in the wetland and approximately 2 feet below the grade of SE 248th St. "This [east/central] portion of the site is probably the result of fill placed on the site or extensive grading of the site in the past, as this portion of the site is essentially level." (EPA 2001)

The culvert was improved to address blockage and fish passage problems in 1996. Habitat enhancement work in 1999 and 2000 connected the wetland to a small spring-fed pond on the neighboring property to the south. Information about the habitat enhancement work performed at the site is provided in "Part 5: Known Site History." (See Figure 5 for view of culvert)

The King County Wetlands Inventory maps Wetland 79 as a Class 3, 0.3 acre wetland, which consists of the main Wetland 79 and two smaller ponds (King County 1991). The wetland is classified as palustrine unconsolidated bottom (cobble/gravel) by the National Wetlands Inventory. A wetland delineation performed at the site more accurately described wetland dimensions as nearly two acres in size, and gave it a Class 2 rating because the wetland has three vegetation classes: palustrine unconsolidated bottom, palustrine scrub shrub, and palustrine emergent (King County 1996). The wetland is considered to have moderate to high fish and wildlife habitat value due to the diversity of habitat types. Additional research by a University of Washington graduate student indicates that the pond and inflow channels cover an area of 0.68 hectares (73,000 square feet), with a mean depth of 1.0 meter and a maximum depth of 2.0 meters (Hall 2002).

Vegetation

Wetland 79 contains a combination of vegetation that has naturally established at the site over time, and vegetation that was planted at the site in association with the King County habitat restoration project.

The mature canopy at Wetland 79 is dominated by red alder, big-leaf maple, and western red cedar. The shrub layer in these areas is primarily typical native shrub species such as salmonberry, Indian plum, snowberry, ninebark, red elderberry, and vine maple. Non-native Himalayan blackberry has spread throughout portions of the site.

Figure 4: View of oxbow taken in 1999.
(Image obtained from CD in King County CPOSA project files.)

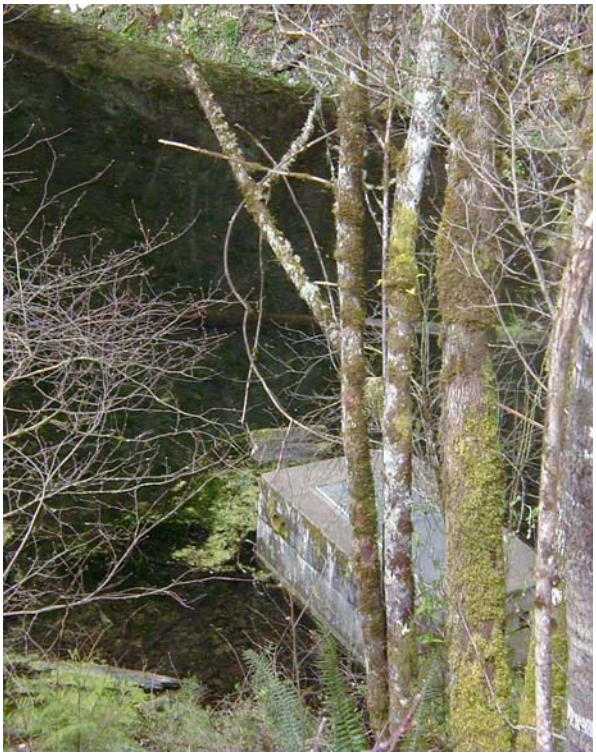


Figure 5: View of culvert at Wetland 79 outlet from Cedar River Trail.
Photo taken in Spring 2003

Extensive plantings were performed at the site in the King County habitat restoration work. CIP monitoring reports indicate that vegetation survival was very high for the project. A list of plants identified at the site during habitat enhancement project site assessments is included as Appendix 1. The monitoring reports characterize the vegetation at a few specific sections of the site (King County 2000a p. 9-7):

- A small side channel on the central eastern portion of the property supports thimbleberry, crabapple, salmonberry, currant, vine maple, sitka spruce, and bigleaf maple. There are few invasive species in this area, though iris is present and may become a problem as it spreads.
- The central portion of the site supports thickets of salmonberry, thimbleberry, snowberry, and vine maple. Monitoring reports indicate some attrition in hemlock planting, and recommends additional plantings of Douglas fir and cedar.
- The north area supports dense blackberries that compete with planted conifers and existing vegetation.

The plantings were overseeded with alder, which is growing into a dense sapling layer. Currently invasive species are controlled around the plantings by the Capital Projects section as part of ongoing project maintenance until the end of the monitoring period in 2006 (Harig pers. comm. 2004; Nopp pers. comm. 2004). Parks staff occasionally perform invasive control work around plantings if this work has not been done by Capital Projects, but this work is not regularly performed by Parks (Harig pers. comm. 2004).

Fish and Wildlife

Salmon have historically used this site for spawning and rearing, though prior to 1996 the inlet culvert was frequently impassable to salmon because of recurrent beaver activity that obstructed the culvert with dams. In 1996, the Wetland 79 Fish Passage Project (described below in Part 5) re-established salmonid access from the Cedar River by attaching a beaver-proof fishway to an existing inlet culvert (King County. N.d.(a)).

Monitoring reports for King County projects have documented fish and wildlife use of the site (King County 2000a, 1999, and 1998a). Spawning sockeye, and juvenile coho salmon, and cutthroat trout have been observed at the site in monitoring visits; steelhead trout are listed as present in the Current and Future Conditions Report. Chinook are present in the Cedar River but are not common in this vicinity (NMFS 2002 p. 18). Additional site research indicates that western brook lamprey and several sculpin species are present at the site (Hall 2002).

Wildlife observed at the site include red-shafted flicker, song sparrow, Stellar's jay, robin, great blue heron, rufous-sided towhee, piliated woodpecker, black-capped chickadee, varied thrush, mallard ducks, red-legged frogs, Pacific tree frogs, squirrels, beavers, and moles. (King County 2000a, 1999, and 1998a)

Part 4. Public Use and Infrastructure

Access

The entrance driveway on SE 248th St is unmarked as public property. A gate at SE 248th St prevents vehicle passage into the site.

The driveway is approximately 700 feet long. This main entrance road into the site provides the primary area for visitors. A few informal trails at the site appear relatively overgrown in a spring 2003 site visit, suggesting that limited use occurs.

Trails may extend onto the site from the Cedar River Trail; King County project reports document erosive informal trails around the wetland outlet (King County 2000a p. 9-8). Use of these trails is discouraged due to problems with erosion and safety; these trails would be blocked by Parks staff when observed.

There usually is an informal path connecting the Cedar River Trail to SE 248th Street at the bridge over 248th, which would be more appropriate for public use than within the Natural Area.

Public Use and Infrastructure

This site is used for walking and nature observation. The site has a relatively low level of usage at this time. The main access road into the site provides the main area at which the public access the site; dense vegetation limits access to many areas along the water.

An interpretive sign written by WLRD Capital Projects group is posted at the north end of the driveway, not visible from SE 248th Street. The sign discusses species presence, restoration project work, and funding. The sign also states:

> "Due to the sensitive nature of the plants and animals living here, this site is not open to the public. Groups are allowed to visit the site by permission only. Please call 206-296-6519 for more information."

This information about access is inaccurate: visitors may access the site. This language was written by CPOSA staff at the time the project was implemented. CPOSA staff noted in retrospect that "the access restriction was mainly due to the fragile nature of the newly constructed project and was not necessarily a long term site condition. We wanted to prevent impacts to the project by giving the new channel time to heal in and the vegetation to establish." (Nopp pers. comm. 2004) CPOSA does not have funding to create a new sign with accurate information. NRL bears responsibility to take care of the sign, including deciding whether to replace the sign if damaged. Until sign replacement occurs, Parks staff will cover this language on the sign if possible (Harig pers. comm. 2004).

There are no facilities or infrastructure to support public use, other than the gate at the entrance and an informal trail system that consists primarily of the main access road. There is occasional dumping of trash at the entrance gate, but litter has not been a problem at the site (Harig pers. comm. 2003a).

Part 5. Known Site History

As noted in Part 3, Wetland 79 was formed by the construction of the railroad embankment in the 1930s. A house and outbuildings were built in 1990. The house was built in the buffer of the wetland, portions of the wetland were filled in, and livestock accessed the open pond area of the wetland (King County N.d.(b) p. 5).

1996 Flooding

In February 1996, the site flooded six feet deep at the location of the house during a time of high flooding in the area, with added contribution from two factors: Rock Creek breaking out of the flume through which it was channeled at the railroad underpass at SE 248th St, and the likely blockage of the culvert at the northern outlet of Wetland 79 (Greenleaf 1998 p.6). Rock Creek flowed as a stream down the driveway of this property (King County 2002). See photos in Figure 6.

1996 King County Restoration Projects

Two projects were implemented by King County at Wetland 79 in 1996: the Fish Passage Project and the Small Habitat Restoration Project (SHRP).

<u>Fish Passage Project</u>

The goal of the Fish Passage Project was to restore access into the pond, providing protected spawning habitat and refuge from high flows (King County N.d.(a)). The inlet culvert was frequently impassable to salmon because of recurrent beaver dam activity that obstructed the culvert. The Fish Passage Project re-established salmonid access from the Cedar River by attaching a 5' by 9' beaver-proof fishway to the

Figure 6. Flooding at site before acquisition.

Top photograph depicts flooding at site during early 1996. For purposes of orientation, same structure is visible in aerial view below taken when water has subsided, which provides view of site from air facing west. (Images obtained from CD in King County CPOSA project files.)

upstream end of an existing inlet culvert. A permanently submerged 18" pipe was attached to the upstream end of the fishway to allow passage under low-flow conditions. Adjustable baffles on the fishway allow water to be impounded at the same level in Wetland 79 as when the pond was dammed by beavers.

Project monitoring reports provide contradictory information about the success of the project. A number of project monitoring reports indicate that the Wetland 79 Fish Passage project was successful in providing adult spawning fish passage into the pond and reducing beaver-related blockages. Adult spawning sockeye were observed in the pond in 1996, 1997, and 1999. The water levels stayed at pre-project levels (King County 2000a and King County N.d. (a)).

However, the 1999 fish passage project monitoring report indicated that there may be ongoing problems with culvert blockage:

> "the submerged culvert leading from the pond into the fishway does become blocked with sediment and floating debris. The culvert is perforated along its side that allows water to pass through, and therefore provides small fish passage if the culvert becomes blocked. However, the openings are not large enough for adult spawners to pass through. The culvert should be examined and cleared often, particularly before the spawning period of August to January" (King County 2000a p. 9-8).

In 1998, culvert blockage reportedly prevented access to the wetland by any spawning sockeye salmon. No King County staff in DNRP monitor the culvert for blockage, nor is there regular clearing of the culvert. (Hansen and Doherty pers comm 2003)

Small Habitat Restoration Project (SHRP)

The goal of the SHRP was to enhance the wetland and riparian habitat between the pond and the residence; the SHRP installed 562 native plants between the pond and the existing residence. Both the SHRP and Fish Passage project were monitored for project success for three years, between 1996 and 1999 (King County N.d.(a)).

1998 Site Acquisition

The site was acquired by King County DNRP in 1998. The house was removed from the site in 1999.

1999-2000 King County Restoration Project

In 1999 and 2000, further restoration work was implemented by King County DNRP, funded jointly by King County and grant from Washington State Department of Natural Resources ALEA grant program (King County 2002). This work included (King County 2002; Nopp pers. comm. 2004):

- Removing fill that had been placed in the wetland;
- Removing silt from a portion of the oxbow channel;
- Enlarging the portion of the wetland that could be used for salmonid spawning by connecting a finger of the open water wetland to a spring-fed pond located on an adjacent piece of property, through a shallow channel;
- Adding woody debris to the wetland and the new channel to increase habitat complexity.
- Planting approximately 2000 new plants around new channel, in wetland, and in wetland buffer.

The project increased habitat available for spawning sockeye and other salmonids; increased rearing and overwintering habitat for coho salmon; provided potential flood refuge habitat for Chinook salmon; and re-established aquatic riparian areas (King County 2002). See Figure 7 for schematic of restoration work.

This work is currently being monitored for success for five years, between 2002 and 2006 (King County 2000b). The recent restoration work performed at the site included connection of Wetland 79 to a pond on the adjacent parcel to the south. There is no monitoring of this pond or any restoration work that occurred on this neighboring parcel; there is no legal access to the pond (a construction easement granted during project work expired after work was completed) (Doherty pers. comm. 2003).

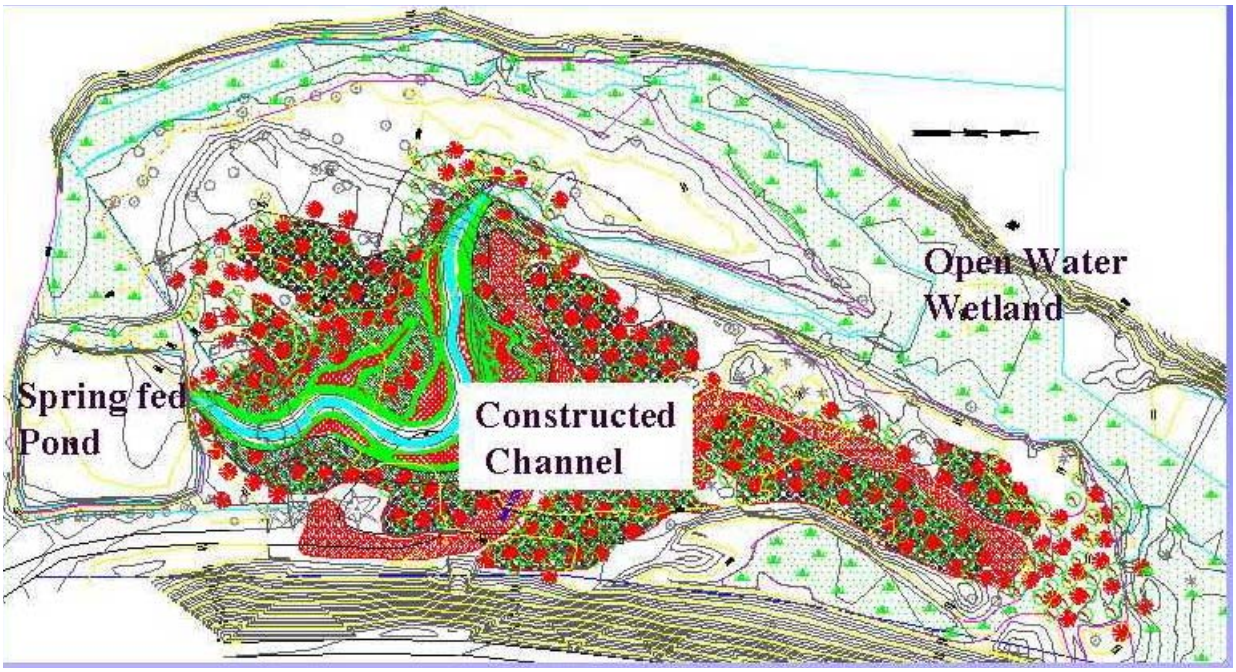


Figure 7. Plan for Wetland 79 Restoration Work.
The figure is oriented with north (and the outlet of the wetland) at the right side of the picture. The Cedar River Trail runs along the bottom of the image. (Obtained from CD in King County CPOSA project files).

Ongoing UW/DNRP Research

Ongoing research between the University of Washington and King County DNRP is occurring at the site, including monitoring and sampling of salmonid populations at Wetland 79. One component of the research is to determine if sockeye spawning in Wetland 79 are genetically distinct from mainstem spawners (McLean, J. and J. Hall. 2003).

Although there was an intention to obtain a conservation easement on the property to the south (parcel 2222069039) in order to perform an additional enhancement or restoration project, no conservation easement was ever obtained and this work was not performed (Bikle pers. comm. 1999).

Part 6. Analysis

The purpose of this section is to provide a context and foundation for developing recommendations that meet the NRL program mission of protecting the ecological value of lands within the Wetland 79 Natural Area. Site-specific information, public access considerations, and the larger landscape considerations described in the conservation principles section of the *Ecological Lands Handbook* (King County 2003a) will be used to help meet this purpose.

Information Gaps and Development of Management Recommendations

This site has been the subject of study and restoration work by the Capital Projects group of King County's Department of Natural Resources and Parks. It is not likely that additional large-scale capital

project work will occur at this site. If large-scale capital project work is to occur on this site, project proponents should determine whether adequate information on ecological conditions at the site exists. It may be necessary and desirable to conduct a site inventory and assessment that is focused, at a minimum, on the conditions and processes that the management activities will affect.

The site inventory, assessment, or evaluations of proposed actions should be conducted by those staff with appropriate expertise (e.g. Watershed and Ecological Assessment group). Inventory and assessment information may be available in the Current and Future Condition Report, Habitat Limiting Factors Analysis, Lower Cedar Basin Plan, and Ecosystem Diagnosis and Treatment study of the Cedar River (being conducted at the time of writing), as well as past and future work by King County Ecological or Capital Projects staff.

Prior to further habitat enhancement activities at this site, the proposed activity should be evaluated to determine whether or not the activity could do harm to existing or future desired ecological processes and conditions. An assessment of current ecological conditions at the site may be required in support of this project. If the evaluation of the project indicates that the likely outcome is harm, then the activity should not be undertaken.

Species of Concern

Because of the lack of a comprehensive biological inventory at the site, the species identified in this document do not account for all species that use the site for one or more stages of their lifecycles. However, documented evidence of Chinook salmon, and probable use by bald eagles, both listed as threatened under the Endangered Species Act, make habitat preservation and restoration necessary management priorities at the site.

Restoring Processes

The primary action to restore ecological processes at the site would be to remove the railroad grade that constrained channel migration and isolated this former meander channel, and to reconnect Wetland 79 with the main river channel. However, the railroad embankment is considered a permanent condition at the site; there are no proposed plans to alter the location of the railroad grade to affect the river's location.

More in-depth analysis of historic river conditions, hydraulics, and hydrology would be needed to determine the approach of any further restoration project to restore ecological processes (as is also true of any project to restore structure and function as described in the next section).

Ecological Structure and Function

Future project ideas at the site that have been noted by CPOSA staff include deepening the channel connecting the wetland with a small pond on the adjacent property to the south (a manmade pond that may be supplied by water diverted from Rock Creek), or addition of woody debris to the site. Though these projects have been described in monitoring documents or in conceptual form by King County DNRP staff, there are currently no projects planned for the site, nor are there CIP funds allocated to projects (Hansen pers. comm. 2003).

The fish culverts installed at the site area were reported to be periodically blocked by debris and sediments in the monitoring report. The report recommended regular monitoring of culvert openings, including regular clearing prior to spawning season. Improvements to the culverts were suggested in the 1999 monitoring report:

> "The senior engineer indicated that an improved design would be one that could be cleared of debris more easily (i.e. a hinged culvert that could be moved toward the short for cleaning). She also highlighted the benefit of having room for adjustable weirs to potentially increase the depth in the pond and wetland" (King County 2000a p. 9-9).

Though the 1999 monitoring report indicates that "the installed vegetation is healthy, is flourishing and does not need to be maintained," it also notes the ongoing competition from blackberry at the site, which is inevitable "unless an integrated method of management is used including a combination of initial herbicide application and weeding thereafter." Recommendations for future projects include blackberry control, and planting "fast-growing trees such as cottonwood and alder with conifer underplantings to shade out blackberry areas. These methods will be used in an additional, large planting project on this property in the near future [i.e. the 2000 project work]." (King County 2000a p. 9-9)

As noted in Part 3: Vegetation, many areas of plantings were overseeded with alder, which is growing into a dense sapling layer. Parks staff has indicated concern that alder may outcompete some of the conifers planted into the site, and noted that there may be future consideration of thinning the alder (Harig pers. comm. 2003a). CPOSA project staff do not agree with this recommendation to thin alder, emphasizing that the goal was to promote natural succession and that shade-tolerant conifers will establish within the alder. CPOSA staff noted that thinning of one area of alder may be appropriate but not throughout the site (Nopp pers. comm. 2004).

In general, to restore habitat conditions, it may be necessary to control invasive, non-native species, and to promote establishment and growth of a native riparian/wetland plant community, where possible, given site and budgetary constraints. Plantings should represent the historic vegetative communities commonly associated with forested riparian areas in western Washington and at this site in particular. Inherent in the restoration should be efforts to maintain structural complexity, historic levels of plant diversity and multiple canopy layers in order to provide a variety of vegetative and physical features that would provide a number of niches for wildlife.

Public Use

The site has limited parking, and therefore is primarily used by local residents or visitors from the Cedar River Trail.

Informal trails that may develop down the steep slopes of the Cedar River Trail are discouraged.

The interpretive sign located within the property provides useful information about the intent of the restoration work at the site, and has not been damaged since it has been erected. WLRD Capital Projects group designed the sign, but does not have money to repair or replace the sign (Nopp pers. comm. 2004). The Natural Resource Lands group would need to decide whether to fund sign replacement if it is damaged. An update to public access language on the sign could occur at that time.

Part 7. Management Goals, Objectives, and Recommendations

The objectives and recommendations in this section are derived from the standard practices for most NRL sites. Office of Rural and Resource Programs staff will revise the recommendations for Wetland 79 Natural Area as new information from baseline inventory, assessment, and site monitoring programs and other initiatives becomes available for use in land management decisions.

Goals for Ecological Lands

The goals for all King County Ecological Lands are to:

- conserve and enhance ecological value, and
- accommodate appropriate public use that does not harm the ecological resources on site

The objectives and recommendations that follow are designed to support these goals at this site.

Management Objectives and Recommendations

Objective: Maintain ecological integrity of the site

Recommendation: Ensure that management and public access support the regional ecological value of site

Decisions about site management and public access should consider the site's functions as a remnant oxbow wetland to the Cedar River, and the significant investment that has been made in habitat restoration. Public use at the site consists of walking and nature observation on the main access road/trail into the site. Use of other areas may occur, so long as this use does not negatively impact site resources. This overarching recommendation is carried out through the various recommendations below.

Objective: Develop long term ecologically based protection and restoration actions

Recommendation: Evaluate recommendations for site restoration as they are developed

At this time, no further projects are planned for the site. When proposals are put forward for habitat enhancement projects (whether developed by the Natural Resource Lands group, other King County groups, or others outside the County) evaluate the proposals for their impacts on the ecological processes, structure, and functions at the site. An ecological assessment of this site may precede project proposals. Projects should meet the purpose and goals of sites identified as King County Ecological Lands.

As projects on the Natural Area are prioritized and funded by King County groups outside of the Natural Resource Lands group (or by other implementing agencies), projects should be reviewed by NRL through the "Application to Alter Parks Division and NRL Managed Properties" process to coordinate site management with project work.

Objective: Contain spread of invasive vegetation

Recommendation: Monitor and control invasive vegetation

Park staff should contain and, where possible, to reduce invasive, non-native species as time and budget permit. While CPOSA has responsibility for invasive species management around plantings through 2006, if funding is available future Parks staff could continue this effort in areas where planting and weed control projects have already occurred. Control is primarily through manual removal of plants by Park staff.

Recommendation: Monitor and maintain restoration project

King County CPOSA staff will perform monitoring for permit conditions, to ensure 80% survival of plants. Plantings are be observed for plant survival, and re-planted where die-off has occurred. Through the required monitoring and maintenance period (2006) CPOSA staff should arrange for maintenance of restoration project, such as control of invasive species around plantings.

Objective: Protect the site from inappropriate public uses

Recommendation: Control litter/dumping and encroachment activities

Park staff should monitor the site for encroachment, dumping, and other trash and respond as necessary to maintain a clean and safe property. Monitoring should occur at least monthly. Occasional trails from the Cedar River Trail to the site are discouraged due to problems with erosion and safety. These trails would be blocked by Parks staff when observed. If damage to the interpretive sign occurs, NRL will need to determine whether sign will be replaced.

Objective: Allow current level of passive recreation opportunities at the sites

Recommendation: Monitor public access

As noted in the first recommendation, public use at the site consists of walking and nature observation on the main access road/trail into the site. Use of other areas may occur, so long as this use does not negatively impact the site (e.g. impacts to vegetation/wetland or soil erosion).

Park staff should note changes in visitor numbers and types of recreational activities at these sites, and observe any 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.

Implementation

Many of these recommendations regard ongoing site maintenance and short-term management. These short-term recommendations are currently being implemented through actions by the Parks Resource Coordinator. Table 3 presents the time frame and sections responsible for recommendations.

Recommendations that address long-term management will need to be developed when funded and prioritized by DNRP management (within the work programs of NRL, Science, Basin Stewards, CPOSA, FHRS). As new information is gathered for the site, restoration projects may be developed subsequent to SMG adoption. Projects should be consistent with management objectives and approaches described above and in the Ecological Lands Handbook. Funding for restoration projects may be available through Surface Water Management CIP funding or salmon conservation planning funds.

Table 3. Matrix of Management Recommendations

Recommendations	Year	Park Resource Staff	Basin Steward	NRL staff	WRIA Project Coord.	CPOSA	WEAT
Priority One							
Monitor and control invasive vegetation	At least monthly	X					
Monitor restoration projects	According to permit conditions					X	
Control litter/dumping and encroachment activities	At least monthly	X					
Monitor public access	At least monthly	X					
Priority Two							
Perform baseline inventories and assessments	As prioritized and funded			X			X
Develop recommendations from inventory information	As prioritized and funded		X	X	X	X	X
Update Site Management Guidelines	Within at least five years			X			

References

Conservation Futures (CFT). 2002 Annual Collections Application for Funds: Instructions and Conditions.

Greenleaf, J. 1998. Appraisal of Heath Property, June 15, 1998. Ref # 98-1029.

Hall, Julie L. 2002. Habitat selection by sockeye salmon in off-channel ponds of the Cedar River and the implications for restoration. Thesis, M. S. Fisheries, University of Washington.

King County. N.d.(b) Wetland 79: Story of a restoration of an abandoned oxbow. King County Surface Water Engineering and Environmental Services, Capital Improvement Programs. Powerpoint Presentation.

King County. N.d.(a) Wetland 79 Fish Passage/Wetland 79 SHRP Project Description. Available online at http://dnr-web.metrokc.gov/wlrd/science/datamgnt/projectdb/index.asp?Action=detail&Project_RowID=1859. Accessed 5/16/03.

King County. N.d. (c). Wetland 79 species. In CPOSA project files.

King County. 2003a. King County Ecological Lands Handbook. King County Department of Natural Resources and Parks, Water and Land Resources Division. Seattle, Washington.

King County. 2003b. The Road to Salmon Recovery: Rock Creek (SE 248th Street) Project. http://www.metrokc.gov/kcdot/roads/salmon/rockcreek.cfm. Last updated 11/17/03.

King County. 2003c. Text transcript of Rock Creek (S.E. 248th Street) Project video. http://www.metrokc.gov/kcdot/roads/salmon/rockcreektext.cfm. Last updated 11/10/03.

King County. 2002. The Cedar River Oxbow Wetland 79 Enhancement Project. Available online at http://dnr.metrokc.gov/WTD/wetland79/.

King County. 2001. Oxbows: Ecology and Importance. Available online at http://dnr.metrokc.gov/WTD/wetland79/oxbow.htm

King County. 2000a. "Wetland 79 Fish Passage/SHRP Monitoring Report" *in* 1999 Annual Report CIP Monitoring Program. Wastewater Treatment Division King County Department of Natural Resources. Dated March 2000.

King County. 2000b. Cedar River Oxbow Restoration Project (Wetland 79) Monitoring Plan. From CPOSA project files.

King County. 1999. "Wetland 79 Fish Passage/SHRP Monitoring Report" *in* 1998 Annual Report CIP Monitoring Program. Wastewater Treatment Division King County Department of Natural Resources. Dated March 1999.

King County. 1998a. "Wetland 79 Fish Passage/SHRP Monitoring Report" *in* 1997 Annual Report CIP Monitoring Program. Wastewater Treatment Division King County Department of Natural Resources. Dated January 1998.

King County. 1998b. Grant Alert for Cedar River Basin Wetland 79 Restoration. King County DNRP Memo by J. White, dated 9/14/1998. Available online at http://dnr-web.metrokc.gov/wlrd/finadmin/doc/samplegrantalertmemo1.doc.

King County. 1996. Wetland Delineation Report for Wetland 79 Fish Passage Improvement. Written by K. Bauman and D. Concannon. August 1994, revised April 1996.

King County. 1993. Current and Future Conditions Report. King County Department of Public Works, Surface Water Management Division. November 1993 printing. Seattle, WA.

King County. 1991. King County Wetlands Inventory. Volume 2: East. King County Environmental Division: Parks, Planning and Resources Department. March, 1991 Edition; 1990 original date.

King County Council. 1993. Ordinance 10750. March 8, 1993. "An Ordinance authorizing the Regional Conservation Futures 1993 Bond Acquisition Program…"

King County Council. 1993. King County Motion 9173 "a motion approving the program plan for Waterways 2000, a pilot project that will protect critical riparian systems in King County."

King County Council. 1989. King County Council Ordinance No. 9071.

King County Open Space Citizen Oversight Committee 1995. Waterways 2000, Acquisition and Stewardship Recommendations.

McLean, J. and J. Hall. 2003. Potential genetic differentiation of sockeye salmon, *Oncorhynchus nerka*, spawning in the mainstem and an off-channel pond of the Cedar River. Project description available online at: http://depts.washington.edu/cwws/Research/Projects/mcleanandhall.html.

NMFS. 2002. ESA Section 7 Consultation #F/NWR/2000/01443. Information for Permit 1309 p. 18. Available online at http://www.nwr.noaa.gov/1publcat/bo/2002/200001443_02-20-2002.pdf

Perkins, S. J. 1994. The Shrinking Cedar River. American Water Resources Association 1994 Annual Summer Symposium. p. 649-658. Available online at http://geopacific.com/Perkins/links.htm

Snyder et al. 1973. Soil Survey of King County, Washington. USDA.

Personal Communication

Bikle, A. 1999. Email comm. with Jon Hansen et al. December 9, 1999.

Doherty, L. 2003. Ecologist, King County DNRP. Personal communication with Ingrid Lundin, King County DNRP. July 23, 2003.

Hansen, J. 2003. Senior Ecologist, King County DNRP. Personal communication with Ingrid Lundin, King County DNRP. July 22, 2003.

Harig, D. 2004. Parks Resource Coordinator, King County DNRP. Personal communication with Ingrid Lundin, King County DNRP. November 15, 2004 and December 2, 2004.

Harig, D. 2003a. Parks Resource Coordinator, King County DNRP. Personal communication with Ingrid Lundin, King County DNRP. March 27, 2003.

Harig, D. 2003b. Parks Resource Coordinator, King County DNRP. Personal email communication with Ingrid Lundin, King County DNRP. October 7, 2003.

Koon, J. 2003. Engineer, King County DNRP. Personal communication with Ingrid Lundin, King County DNRP. July 26, 2003.

Nopp, F. 2004. Landscape Architect. King County DNRP Capital Projects and Open Space Acquisitions. Email and personal communication with Ingrid Lundin, and written comments on SMG. November 30, 2004.

Appendix 1: Plant Species List

Species list compiled from King County 1996, King County 2000a, and King County N.d. (c).

Trees	
Acer macrophyllum	Big-leaf maple
Alnus rubra	Red alder
Malus fusca	Crabapple
Pseudotsuga menziesii	Douglas-fir
Picea sitchensis	Sitka spruce
Thuja plicata	Western red cedar
Tsuga heterophylla	Western hemlock
Shrubs	
Acer circinatum	Vine maple
Cornus sericea	Red-osier dogwood
Oemleria cerasiformis	Indian plum
Physocarpus capitatus	Ninebark
Rhamnus purshiana	Cascara buckthorn
Ribes bracteosum	California black currant
Ribes divaricatum	Straggly gooseberry
Rosa spp.	Wild rose
Rubus discolor	Himalayan blackberry
Rubus laciniatus	Cut-leaf blackberry
Rubus parviflorus	Western thimbleberry
Rubus spectabilis	Salmonberry
Rubus vitifolius	California blackberry
Sambucus racemosa	Red elderberry
Symphoricarpos albus	Snowberry
Vaccinium parvifolium	Red huckleberry
Herbs and forbs	
Agrostis alba	Redtop
Agropyron repens	Quackgrass
Agrostis tenuis	Colonial bentgrass
Athyrium filix-femina	Subarctic lady fern
Solanum dulcamara	Bittersweet nightshade
Carex deweyana	Short-scale sedge
Cirsium spp.	Thistle
Claytonia sibirica	Siberian spring beauty
Corydalis scouleri	Scouler's corydalis
Dicentra formosa	Pacific bleedingheart
Epilobium spp.	Willow-herb
Geranium robertianum	Robert's geranium
Geum macrophyllum	Large-leaf avens
Glyceria elata	Tall manna grass
Hydrophyllum tenuipes	Pacific waterleaf
Lemna minor	Duckweed
Maianthemum dilatatum	False lily-of-the-valley
Montia linearis	Narrow-leaved montia
Myosotis scorpiodies	True forget-me-not
Myosotis laxa	Forget-me-not
Oenanthe sarmentosa	Water-parsley
Poa pratensis	Kentucky bluegrass
Polystichum munitum	Sword fern
Ranunculus repens	Creeping buttercup
Ranunculus unctinatus	Little buttercup
Rumex crispa	Curly dock
Tellima grandiflora	Fringecup
Tolmiea menziesii	Piggy-back plant
Urtica dioica	Stinging nettle
Veronica americana	American speedwell

Appendix 2: Draft Version of Sign at Site

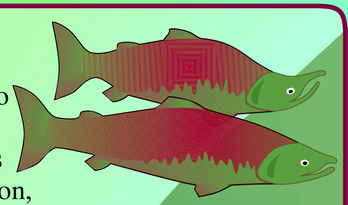
Draft version of CPOSA sign posted at site, obtained from CD in CPOSA project files.

The Cedar River
OXBOW WETLAND
Project

WHO LIVES AT THE OXBOW WETLAND?

Sockeye and Coho Salmon

Sockeye Salmon use areas of the pond to build their redds. Coho Salmon juveniles come to the pond from the nearby Cedar River and its tributaries. These fish may spend up to two years here before going downstream to Lake Washington, Puget Sound and then out into the Pacific Ocean.



Waterfowl and Raptors

Many types of birds use this wetland during at least some part of the year. These birds include: Ducks, Eagles, Hawks and Herons. Wetlands are an important habitat for birds because they provide some protection from predators and good sources of food, such as fish, insects and berries.

Trout and Amphibians

Cuthroat trout, salamanders and frogs all call this wetland home. Year round water, protection from floods on the Cedar River and a good supply of food make this a good place for many species to live.

WHAT WAS DONE TO HELP RESTORE THIS WETLAND?

In July of 1999 a repeatedly flood damaged home was purchased and removed.

Then a plan to restore the wetland was created. In August of 2000, restoration of the wetland began.

During the Fall of 2000 almost two thousand trees and twentyfive hundred shrubs were planted to help restore this oxbow ecosystem.

The acquisiton, design and restoration of this site was a cooperative effort by state and county agencies. The acquisition and restoration of this important oxbow wetland is another step in improving the health of the Cedar River ecosystem.

This facility was funded in part by the Aquatic Lands Enhancement Account (ALEA) Program of the Washington Department of Natural Resources. The ALEA program is financed entirely from revenue generated from state-owned aquatic lands under DNR's management. This project meets DNR's objectives by restoring aquatic habitat and freshwater shorelines for the people of Washington State.

Due to the sensitive nature of the plants and animals living here this site is not open to the public. Groups are allowed to visit the site by permission only. Please call 206-296-6519 for more information.

WASHINGTON STATE DEPARTMENT OF
Natural Resources