

Rainbow Bend Natural Area Site Management Guidelines

November 2004

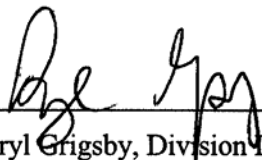


King County

Department of Natural Resources and Parks
Water and Land Resources Division

Rainbow Bend Natural Area Site Management Guidelines

November 2004



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King County Water and Land Resources Division



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Rainbow Bend Natural Area Site Management Guidelines

Summary

Site Description

Rainbow Bend 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.

Rainbow Bend Natural Area consists of a single parcel that is 0.65 acres in size. Future acquisitions are anticipated to add acreage to the Natural Area. The property is located approximately four miles southeast of Renton and three miles north of Maple Valley. The site is located along SE 180th Street off of Cedar Grove Road, on a peninsula of land extending into the river which is surrounded on three sides by pronounced peninsulas of the Cedar River. The Cedar Grove Mobile Home Park occupies a 20-acre parcel at the northern end of the Rainbow Bend peninsula, at the end of SE 179th St.

The parcel was purchased with King Conservation District funds, and a covenant directs the primary use of the site for habitat conservation purposes, with recreational uses to be subordinate to this primary purpose.

This reach of the Cedar River was formerly extensively braided, but the channel location has been relatively stable in recent years due to substantial bank armoring in the form of levees and revetments along a large proportion of the bankline, as well as locations where the river flows against the valley wall. The Rainbow Bend levee runs along the southern edge of the Rainbow Bend peninsula (and the Natural Area). The entire Rainbow Bend peninsula lies completely within the 100-year floodplain; the floodway (the area of deepest and fastest flows) extends across much of the riverward side of the peninsula. Recent flooding in the 1990s inundated most of the land within the floodplain.

The Rainbow Bend parcel is densely vegetated with shrubs and trees. The canopy is deciduous, with bigleaf maple, black cottonwood, and red alder. Shrubs include red osier dogwood, vine maple, snowberry, blackberries, and Japanese knotweed. The neighboring houses have grass lawns that extend to the property boundary. The parcel supports a small scrub-shrub wetland on part of the site.

The large gravels in this part of the river are suitable for spawning by sockeye, Chinook, and coho salmon, as well as rainbow, steelhead, and cutthroat trout.

Public Use

At this time, the very small size of the parcel means that little management activity may be taken at the site. The small size, dense vegetation, and wetland conditions limit public use. The dense shrub vegetation restricts public access to the Rainbow Bend parcel from SE 180th St. There may be access available from adjacent private property on the southern side of the property along the levee, but access would be limited to occasional use from the river or from neighboring parcels.

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: Upon future acquisition of property in the Rainbow Bend vicinity, develop long term ecologically based protection and restoration actions

Recommendation: Perform baseline inventories and assessments

Future purchases of home sites or mobile home park within this reach would add acreage to the current Natural Area and advance the opportunity to restore ecological processes, structure, and functions. When properties have been added to comprise a significant size and contiguous acreage, consider completing baseline inventories and assessment of basic ecological conditions and physical processes. Staff with appropriate expertise (e.g., ecologists, biologists, and engineers) should perform this work. Existing documents, studies, and staff research may contribute substantial inventory and assessment information about the sites. Acquisition of additional flood-prone parcels and subsequent site restoration may be done as a component of future Flood Hazard Reduction Services work in this area.

Recommendation: Develop recommendations for site restoration from inventory information

Use inventory and assessment information to develop projects to achieve a set of goals and objectives consistent with those identified for King County Ecological Lands.

The Cedar River Basin Plan, Flood Hazard Reduction Plan (FHRP), and WRIA 8 Chinook Salmon Conservation Plan contain a number of recommendations for this area that can be considered for future recommendations. These general proposals are aimed at the multiple objectives of the basin plan (flood hazard reduction, habitat quality and salmonid health, and water quality and quantity) and FHRP and have not as yet been prioritized or funded.

The main recommendation is to purchase and remove homes from the floodway on the Rainbow Bend peninsula (including mobile home park). Acquisition and habitat restoration work associated with it would likely be the responsibility of the Flood Hazard Reduction Services program. A decision will need to be made as to whether NRL or FHRS will manage these properties once acquired (further discussion on this topic is found later in this paper).

As projects on Rainbow Bend Natural Area parcels are prioritized and funded by King County agencies 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: Protect the site from inappropriate uses

Recommendation: Monitor public access and use

Park staff should inspect the site monthly to determine whether there has been any dumping or other inappropriate uses. Inspection should occur regularly from SE 180th Street, and periodically from the levee access road. Given the presence of dense vegetation and wetland conditions along the road frontage, this site provides little opportunity for public access. Future acquisitions in the area are expected to add to the inventory, at which time there should be more opportunity for passive recreational access.

Objective: Contain spread of invasive vegetation

Recommendation: Monitor and contain invasive vegetation

Park staff should monitor the presence of noxious and invasive plant species at the site. If a spread in invasive species is noted, use manual control to contain the spread of invasives. When staff time and resources are available for ongoing work, control existing invasive species at the site.

Objective: Coordinate management of future acquisitions

Recommendation: Support placing all county-owned parcels in Rainbow Bend together under a single program for management

As new acquisitions enter the inventory, it may be most practical from a site management perspective to place them all under one program for management. This may be most efficient from the perspective of parcel contiguity, the need for ecological functioning and managing public use across the parcels, and the efficiency of having site maintenance performed by a single party. While a future FHRS project is planned for this area, NRL currently manages the county-owned property in Rainbow Bend and may be the appropriate manager for future acquisitions in this area.

More broadly, there could be a general policy decision by WLRD management of whether to place new acquisitions in areas of future FHRS projects into the FHRS or the NRL inventory. This decision should consider how to promote efficient management; support of ecological, public access, and flood hazard reduction goals; and future project implementation.

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Rainbow Bend Natural Area Site Management Guidelines

Introduction

Rainbow Bend 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 Rainbow Bend Natural Area. These site management guidelines were developed using guidance established in the King County Ecological Lands Handbook (King County 2003a).

Part 1. General Property Information

Rainbow Bend Natural Area consists of a single parcel that is 0.65 acres in size. The Natural Area is located at approximately River Mile 11.3, right bank (facing downstream) of the Cedar River. The Natural Area is located in unincorporated King County, approximately four miles southeast of Renton and three miles north of Maple Valley. See Figure 1 for a vicinity map and Figure 2 for a site map depicting river miles. Table 1 provides general information about the location of the Natural Area. Table 2 provides specific information for the parcel.

The site is located between 20457 and 20613 SE 180th St. This property is a vacant lot among a series of residential parcels bordering the Cedar River zoned rural residential, one house per 5 acres (although houses along SE 180th Street are built on lots approximately $\frac{3}{4}$ acre in size). The site is located on an area of land approximately 50 acres in size which is surrounded on three sides by the Cedar River, which makes sharp meander bends around the land. This area of land surrounded on three sides by the river will be referred to as the “Rainbow Bend peninsula” in this document. The Cedar Grove Mobile Home Park occupies a 20-acre parcel at the northern end of the Rainbow Bend peninsula, at the end of SE 179th St. Just east of the site, near Cedar Grove Road, are a number of large parcels zoned for mineral extraction.

Table 1. Rainbow Bend Natural Area General Information.

Best Available Address	Between 20457 and 20613 SE 180 th St
Thomas Guide Map Location	687 G1
Legal Description	Section 32, Township 23, Range 6
Acreage	0.65 acres
Drainage Basin	Lower Cedar River
WRIA	8
Council District	12
King County Sensitive Areas	Stream, FEMA 100-year floodplain and floodway

Table 2. Rainbow Bend Natural Area Parcel Information.

Parcel #	Name used in SMG*	Acreage**	Purchase Date	Ownership type/price	Previous Names	Zoning	Funding Source	Recording Number
7120400045	Rainbow Bend-0045	0.65	7/29/02	Owned in Fee; \$30,000	“Broad”; “Broad – Cedar River 1985”; “Broad – sandbar 1985”	RA-5	Cedar River Opportunity Fund	20020731003607 Deed; 20040623001599 Covenant

*Parcels are referred to by the site name plus the last four digits of the ten-digit parcel number.

**Acreage from King County Assessor’s data.

To the east of these parcels lies the King County Cedar Hills Landfill. Rainbow Bend Natural Area is directly across the river from Cedar Grove Road Natural Area, another King County Ecological Land.

Part 2. Acquisition History, Funding Source and Deed Restrictions

The property was purchased with a King Conservation District (KCD) grant to the Cedar River Opportunity Fund (CROF) (King County 2001a). This fund originated with Lake Washington Forum staff during the 1998-1999 allocation of KCD funds (King County 2001b). CROF funds from the 1998-99 funding round are to be used acquire property “to preserve future habitat restoration opportunities,” to leverage other funds for habitat acquisition, and to leverage other funds for flood buyout opportunities (King County 2001b).

A 2004 recorded document contains “Covenants, Conditions and Restrictions” on this property (20040623001599). This document indicates that the Cedar River Opportunity Fund is “to provide funds for rapid response in the event properties came available for which other funding was not available and sale to third parties might result in the irrevocable loss of future habitat protection and restoration opportunities.”

The covenant contains the following language:

“King County, for itself and its successors and assigns, hereby agrees to use and manage the real property for the purpose of protecting, restoring, and/or enhancing native fish and wildlife habitat and the natural features and processes sustaining such habitat. Further, King County acknowledges that it is responsible for exercising long term control over the property to ensure the primary habitat conservation purpose of the real property. Recreational uses, if any, are subordinate to the primary habitat conservation purpose.”

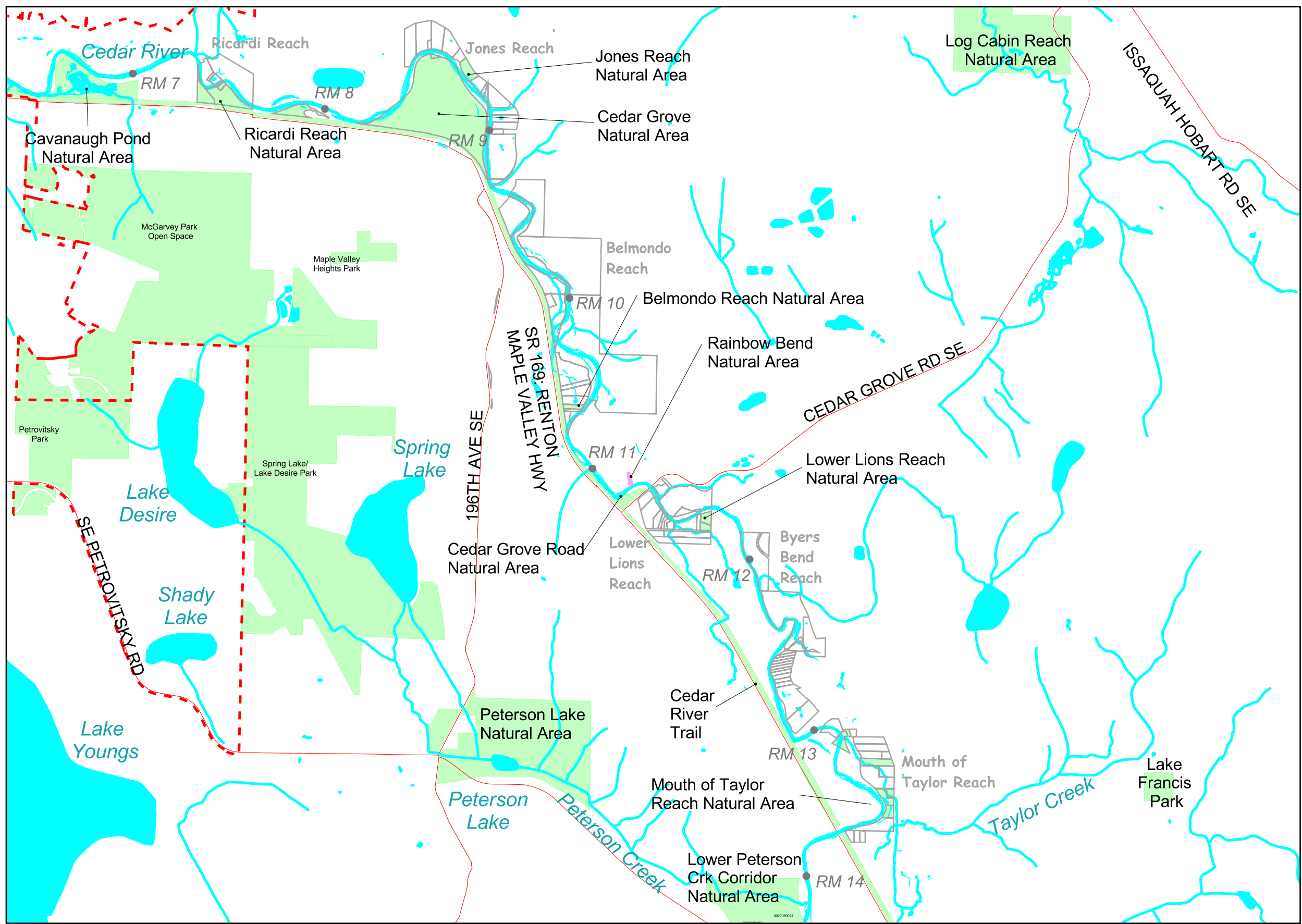
This acquisition was prioritized through basin and flood hazard reduction planning to advance ecological and flood reduction goals for this reach. Future acquisitions in this area may add acreage to Rainbow Bend Natural Area.

When this parcel was in private ownership, a river protection easement was purchased by what is now the King County Flood Hazard Reduction Services group (FHRS) in the 1960s (Recording number 5070276). The river protection easement was located along the southern boundary of the site. The King County river protection easement no longer exists once King County purchases the property. If the property is transferred to another King County Division or Department for management, WLRD management will need to ensure that a similar policy decision is made to secure FHRS’ right of access, or that this right is formalized in an interagency agreement. If the parcel were to be surplus in the future, King County would need to make sure it retains a river protection easement. Further information about the flood facilities is located in Part 3; information about policy on FHRS access and maintenance of their flood facility is provided in Part 4.

There are no other explicit restrictions on the title deed or insurance documents that affect use of the site.


Part 3. Ecological and Physical Setting

This section describes the existing natural resources and ecological processes associated with the Rainbow Bend Natural Area. Additional analysis is presented in Part 6 below. Figure 2 provides information on site features including topography, streams, wetlands, and floodplains.



Legend


- Rainbow Bend Natural Area
- Selected Public Lands
- River Mile Markers
River Miles as Mapped in Basin Action Plan
- River Reach Boundaries
Lower Cedar River reach extents are designated by Cedar River Legacy Program
- Rivers and Lakes
- Streams
- KC Urban Growth Area
- Streets



February 24, 2004

800 0 800 1600 2400 3200 4000 Feet

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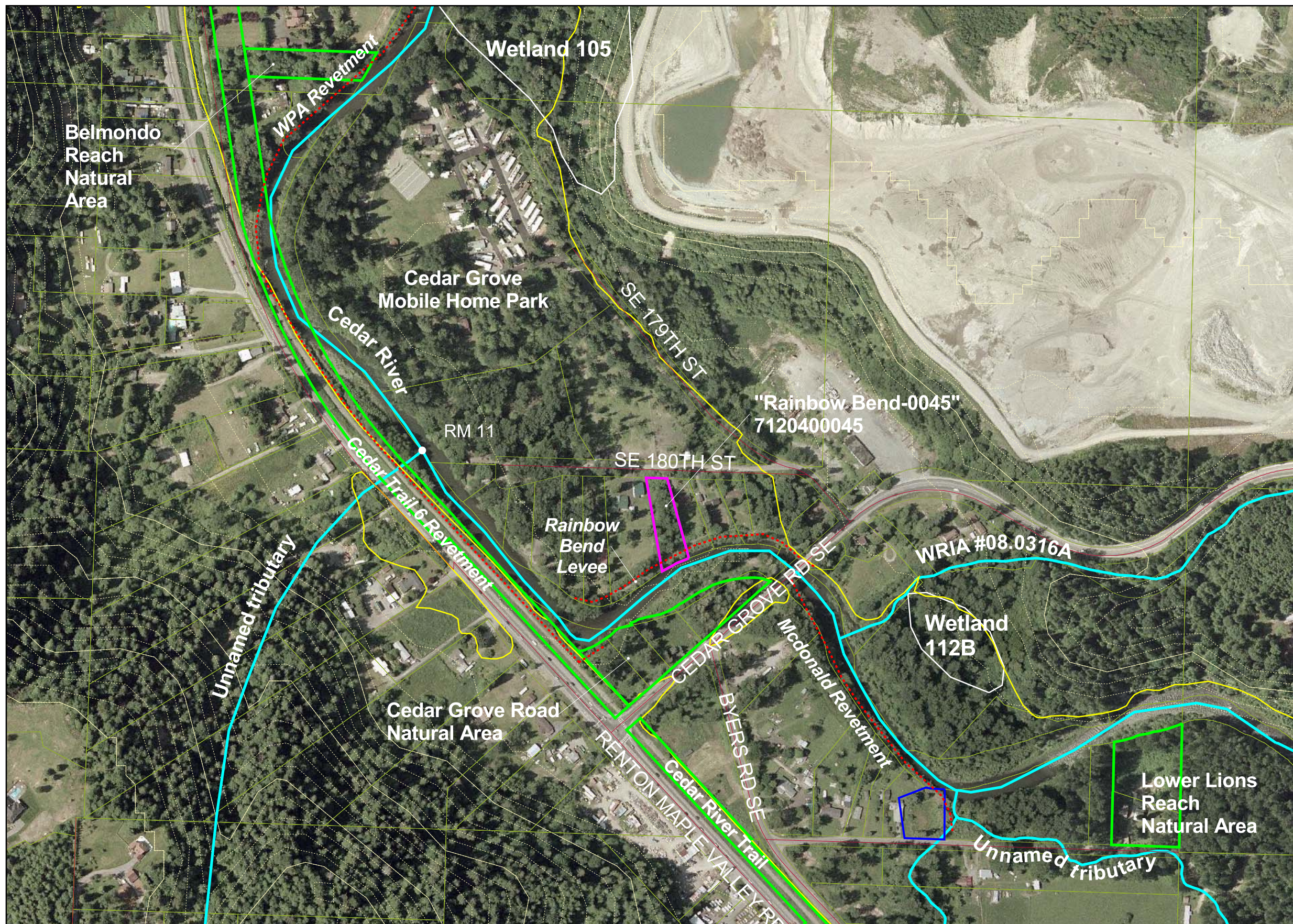


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Figure 1

Rainbow Bend Natural Area: Vicinity Map



Legend

- River Mile Markers
- Levees and Revetments
- ▭ Rainbow Bend Natural Area
- ▭ Selected Public Lands
- ▭ Flood Hazard Reduction Services property
- ▭ Cedar River Trail
- ▭ Streets
- ▭ Floodplains - 100 year
- ▭ Wetlands
- ▭ Streams
- ▭ 100 ft Contour Lines
- ▭ 20 ft Contour Lines
- ▭ King County Tax Parcels



December 15, 2003
 100 0 100 200 300 400 500 Feet

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Note: Streams, wetland, floodplain, and topography layers are approximate. Aerial photography from 2000.



King County

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Figure 2

Rainbow Bend Natural Area: Site Features

Topography and Soils

The Cedar River valley in the vicinity of Rainbow Bend Natural Area is approximately 1/3 mile wide. The valley is bounded by steep slopes abutting residential parcels along SR 169 to the west, and steep

undeveloped slopes on the east side of the Cedar River. The river meanders across the flat valley bottom through this reach, the western extent of the meanders limited by the Cedar River Trail and SR 169.

Approximately 1/3 mile upstream, the river runs at the toe of the steep eastern valley slopes. In the vicinity of Rainbow Bend-0045, the river is located in the central portion of the valley.

The King County soil survey maps this site as Pilchuck fine loamy sand. (Snyder et al 1973) Pilchuck loamy fine sand is located on terraces adjacent to streams, found at low elevation, with 0-2% slopes and rapid permeability. Common inclusions are high amounts of riverwash, Puyallup, and other soil types.

Hydrology and Channel Morphology

Cedar River

Using maps and aerial photographs, Perkins (1994, cited in King County 1993a p. 5-22) describes historic changes in channel characteristics between RM 10 (note that Perkins uses RM 9.4) and RM 13.8. This reach was identified based on channel morphology and slope. The Cedar River Current and Future Conditions Report describes this reach as follows:

“[The reach] was extensively braided in 1865, with braided zones ranging in width from 800 to 1300 feet so that the river occupied almost the entire width of the valley floor. By 1936, the river had abandoned many of its channels but still had an obvious meander belt between 300 and 600 feet wide... Most bends in this reach are constrained by revetments or the valley wall, leading to a relatively stable channel in the past two decades.” (King County 1993a, p. 5-29)

Perkins noted that the 1895 active channel width was 460 feet, and in 1989 the active channel width was only 120 feet. She also characterized the natural degree of confinement as “unconfined,” but characterized the current level of hydrological modifications as “high.” The wetted channel width has decreased from a maximum of 299 feet and minimum of 161 feet in 1895 to a maximum of 108 feet and minimum of 90 feet in 1989. During this same time period the historic pool frequency has decreased from “high” in 1895 to “low” in 1989. (Perkins 1994, Blair 2003)

A Stream and Wetland Special Study (King County 2000) was prepared for a restoration project at Cedar Grove Road Natural Area (across the river). The study indicated that the Cedar River supports a pool on the right bank from scour against the riprap of Rainbow Bend Levee, and deposition along the left bank along Cedar Grove Road Natural Area. At the west end of Cedar Grove Road Natural Area, there is a deep pool on the left bank where the river turns north against the nearly vertical and heavily armored bank against the Cedar River Trail and SR 169. The right bank, armored with the Rainbow Bend Levee, supports a depositional area at this curve.

FEMA 100-year floodplain and floodway

The mapped FEMA 100-year floodplain for the Cedar River depicts areas predicted to be inundated by a flood event of a severity that has a 1% chance of occurring in any given year (Faegenburg pers. comm. 2004) (see Figure 2). The mapped FEMA 100-year floodplain through the reach includes most of the valley bottom between the eastern valley slopes and the Cedar River Trail. The 100-year floodplain is mapped at approximately 1/3 mile wide within 1/2 mile upstream of Rainbow Bend Natural Area; at the site it is approximately 1/4 mile wide and

encompasses the entire Rainbow Bend peninsula; in less than a mile downstream through Belmondo Reach the mapped floodplain narrows to 1/10 mile wide.

The FEMA floodway is the area within and adjacent to the channel that is subject to the deepest and fastest flood flows. The floodway is not mapped on Figure 2, but is contained entirely within the mapped 100-year floodplain. The floodway extends across the riverward side of the Rainbow Bend peninsula, including Rainbow Bend Natural Area. The 100-year floodplain and floodway maps for this reach of the Cedar River have been recently updated and are considered best available data, but are awaiting adoption by FEMA (Faegenburg, pers. comm. 2004).

Levees and Revetments

The Rainbow Bend levee extends along the right bank (facing downstream) of the Cedar River in this vicinity. The Cedar Trail 6 Revetment extends along the Cedar River Trail on the left bank of the Cedar River just downstream of Cedar Grove Road Natural Area. (See Figure 2) Further information about maintenance of this flood facility is provided in Part 4.

Tributaries

There are no known tributaries or side channels in the immediate vicinity of Rainbow Bend Natural Area. The Catalog of Washington Streams maps the 0.35-mile right bank tributary WRIA #08.0316 on the downstream end of the Rainbow Bend peninsula, in the vicinity of Wetland 105 (see Figure 2) (Williams et al. 1975). The Cedar River Current and Future Conditions Report indicates that deep pool habitat is lacking in this tributary (King County 1993a p. 7-30).

Another tributary (WRIA #08.0316A) is located at approximately River Mile 11.5, 0.3 miles upstream of Rainbow Bend Natural Area. The Cedar River Current and Future Conditions Report indicates that the tributary basin is largely undeveloped, with no record of any flooding problems and no future problems expected (King County 1993a p. 4-23). The report indicates that deep pool habitat is lacking in this tributary (King County 1993a p. 7-30).

Two unnamed, unnumbered tributaries are not documented in the Current and Future Conditions Report or Catalog of Washington Streams, but are mapped by King County Stream GIS data layers (see Figure 2; King County 1993a and Williams et al. 1975). One tributary is in the vicinity of Lower Lions Reach Natural Area, at RM 11.6, evident in Figure 2. This tributary is mapped as receiving drainage from a wetland on the east side of SR 169 and steep slopes on the west side of SR 169. The other tributary is mapped as drainage from steep slopes on the west side of SR 169, passing under SR 169 and entering the Cedar River at RM 11.1. No information is available on either of these tributaries.

Wetlands

A wetland analysis conducted for the sale identified a Class 2 wetland on the northern half of the Rainbow Bend-0045 parcel, supporting scrub shrub and tree vegetation (Mortensen 2002). This wetland was not described by the King County Wetland inventory.

The King County Wetland Inventory maps Wetland 105 on both sides of the river on the downstream end of the Rainbow Bend peninsula. This 9.2-acre, Class 2 wetland supports palustrine forested deciduous and evergreen stands (King County 1991).

Wetland 112B is identified upstream of the Rainbow Bend-0045 parcel, but this site was not inventoried in the King County Wetland Inventory.

Vegetation

The undeveloped portions of lots in this vicinity are characterized by typical riparian vegetation dominated by red alder and black cottonwood.

The Rainbow Bend-0045 parcel is densely vegetated with shrubs and trees. The canopy is deciduous, with bigleaf maple, black cottonwood, and red alder. Shrubs include red osier dogwood, vine maple, snowberry, blackberries, and Japanese knotweed. The neighboring houses have grass lawns that extend to the property boundary. The previous owner of the site indicated that it had last been cleared in about 1985. (King County 2001c) The 2002 wetland delineation report notes that knotweed occurs landward of the levee and at the margins of the wetland (Mortenson 2002). See Figure 3 for site photo taken from SE 180th Street.

The King County Wetland Inventory indicates that species observed at Wetland 105 at the downstream end of the Rainbow Bend peninsula include bigleaf maple, black cottonwood, red alder, western red cedar, vine maple, red osier dogwood, twinberry, blackberry, elderberry, salmonberry, and willow (King County 1991).

Figure 3. Vegetation at Rainbow Bend Natural Area.



Fish and Wildlife

There has been no data collected on wildlife presence on this site.

The Stream and Wetland Study indicated that the Cedar River substrate in the vicinity is large gravels, with smaller gravels and sand in depositional areas. Gravels are of a size suitable for spawning by sockeye, Chinook, and coho salmon, as well as rainbow, steelhead, and cutthroat trout. The report documented adult Chinook and sockeye spawning in the mainstem, and presence of Chinook, coho, and trout fry in the immediate vicinity (King County 2000). The study notes that depositional areas along the left bank provide good rearing habitat for juvenile salmonids, along the portion of the bank with willow cover. The backwaters and side channels along this reach may support off-channel spawning or rearing areas for salmonids.

Part 4. Public Use and Infrastructure

The dense shrub vegetation restricts public access to the Rainbow Bend-0045 parcel from SE 180th St. There may be access available from adjacent private property on the southern side of the property along the levee, which is visible as a cleared area in aerial photos. Acquisition documents indicate that “the rear portion of the property can be accessed along a dike path leading from Cedar Grove Road.” (King County 2002, p. 4) This access would be limited to occasional use from the river or from neighboring parcels. There is no public access point to this

levee since this would cross private property. The property boundaries are unmarked and unfenced. The boundaries have not been surveyed, but there is not known encroachment of neighboring properties.

Flood facility maintenance

Although King County FHRS' river protection easement is no longer in existence, it is the policy of the Water and Land Resources Division that FHRS has the same rights and responsibilities for the river protection easement as when the property was under private ownership. Rights include the right to access and to ensure that the flood facility is maintained; responsibilities include notification of property owner (NRL) when work is required on the facility, and obtaining applicable permits. Work that is outside of the scope of standard inspection of river protection facility (e.g. revegetation project or facility repair) would require notification of NRL and completion and approval of the "Application to alter Parks/NRL-Managed Property."

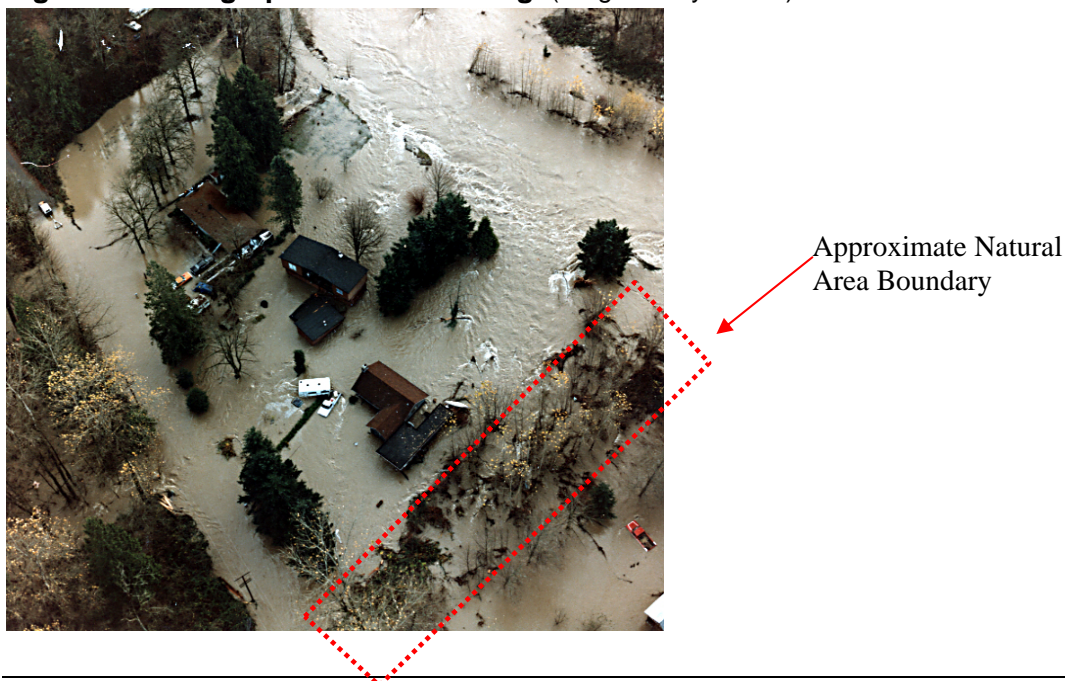
The river protection facility on the property is maintained by FHRS as part of their river protection facility inventory. FHRS performs both routine and post-flood inspections and maintenance on all such facilities. Routine maintenance activities on these facilities typically include vegetation management, such as removal of blackberries, in order to ensure adequate access and visibility for inspection of the facilities' structural integrity (Koon pers. comm. 2003).

In addition to the routine maintenance and repair of these flood hazard reduction facilities, the FHRS Section performs mapping and other flood-related studies and projects on lands adjacent to King County's large rivers, including the Cedar River. FHRS and/or its contracted surveyors may have placed permanent stakes or rebar along the levee/revetment or riverbanks to mark sites at which river cross-sections are measured (Koon pers. comm. 2003).

Part 5. Site Management Chronology

The Rainbow Bend levee was installed as part of the 1960s King County River Improvement Program. The 1993 Flood Hazard Reduction Plan identifies flooding problems in the "Rainbow Bend/Cedar Grove Trailer Court" area, Project #511. (King County 1993b, p. B-131 and 132) The area described includes the Rainbow Bend-0045 parcel. (See Figure 4 below.)

Figure 4. Photograph of 1990 flooding. (King County 2003b).



“[Flood flows overtop both the levee and the non-leveed riverbanks]; flows are deep and fast, even during moderate flood events. The Thanksgiving 1990 flood extensively damaged the County roads, residential homes [structures]...and the Rainbow Bend levee. All of the impacted properties are located in a high-velocity floodway. The damages are repetitive and are compounded by debris deposits cresting over the levee...Severe overbank scouring of side channels damaged several residences immediately adjacent to the Rainbow Bend levee.”

Little maintenance activity has been performed on the site since acquisition except for routine periodic site inspection. In late winter 2004 an adjacent property owner contacted Parks regarding concerns about hazard trees on the property; tree evaluation occurred in fall 2004 and final report is pending at the time of writing.

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 land in Rainbow Bend Natural Area. Site-specific information, public access considerations, and the larger landscape considerations described in the conservation principles section of the *Ecological Lands Handbook* will be used to help meet this purpose.

Information Gaps and Development of Management Recommendations

Future acquisitions may add acreage to Rainbow Bend Natural Area. Given the small size of the current site, the following biological assessment and recommendation development should occur upon addition of future acreage.

There are significant gaps in how much is known and understood about ecological conditions and physical processes in this reach because recent comprehensive baseline inventories of plant, fish, and wildlife species, and geologic and hydrologic conditions do not exist. This type of information is necessary prior to developing restoration concepts and specific designs, particularly for large-scale changes and modifications to site features. If basic site inventory and assessment is not done, there is a strong likelihood of inadvertently harming either individual plant or animal species or ecological processes that sustain one or more of these species.

Therefore, prior to undertaking major management activities in this Natural Area, a site inventory and assessment should be undertaken that is focused, at a minimum, on the conditions and processes that the management activities will affect. Such assessment or evaluations of proposed actions should be conducted by those staff with appropriate expertise (e.g. Watershed and Ecological Assessment Team staff). Information from the 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 staff, provide substantial inventory and assessment information about Lower Cedar River sites.

Prior to minor management activities (e.g., small planting project), 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. If 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 Process

The primary restoration goal for portions of the mainstem Natural Area sites confined by levees should be to reconnect the river channel with its floodplain. Although this action could be accomplished in various ways (e.g. by removal or modification of the existing levees and revetments to trigger channel migration and reestablishment of connections between the main channel and off-channel floodplain) in-depth analysis of historic river conditions, hydraulics, and hydrology would be needed to determine the best approach for improving the channel-floodplain connection and ensuring that the project does not result in adverse flood impacts.

Recommendations made in current planning documents are listed in Part 7: Recommendations.

Recommendations to restore ecological processes must be pursued after acquisition of additional acreage.

Restoring Structure and Function

In order to restore riparian habitat conditions, it may be necessary to control invasive, non-native species, and actively promote establishment and growth of a native riparian 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.

Recommendations to restore ecological structure and function should be pursued after acquisition of additional acreage. At this time, the very small size of the site makes habitat enhancement investment impractical.

Public Use

At this time, the very small size of the parcel means that little management activity may be taken at the site. The small size, dense vegetation, and wetland conditions limit public use. There are no apparent issues of inappropriate public use or access that require attention at this time.

Management of Future Acquisitions

Future acquisitions are expected to occur in this vicinity, with a goal of acquiring most or all of the property on this frequently flooded peninsula. The Flood Hazard Reduction Services program has plans for future levee modification/removal and habitat restoration in the area.

As parcels are acquired in this peninsula, WLRD management will have to determine whether those properties are added to the FHRS property inventory or the Natural Area inventory (where most Cedar River Legacy acquisitions are placed).

At several sites along the Cedar River where WLRD has acquired parcels in areas where FHRS levee setbacks are planned, inconsistent decisions have been made over the years as to which whether these new acquisitions should be placed in FHRS or Natural Resource Lands property inventory. In some areas, NRL and FHRS currently manage adjacent parcels.

Given parcel contiguity, the need for ecological functioning and managing public use across the parcels, and the efficiency of having site maintenance performed by a single party, it makes sense to have a single program hold management responsibility for contiguous County-owned parcels

in a vicinity. This issue would need to be addressed at a management level within the Water and Land Resources Division.

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 Rainbow Bend 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 Rainbow Bend Natural Area

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 Rainbow Bend Natural Area.

Management Objectives and Recommendations

Objective: Upon future acquisition of property in the Rainbow Bend vicinity, develop long term ecologically based protection and restoration actions

Recommendation: Perform baseline inventories and assessments

Future purchases of home sites or mobile home park within this reach would add acreage to the current Natural Area and advance the opportunity restore ecological processes, structure, and functions. When properties have been added to comprise a significant size and contiguous acreage, consider completing baseline inventories and assessment of basic ecological conditions and physical processes. Staff with appropriate expertise (e.g., ecologists, biologists, and engineers) should perform this work. Existing documents, studies, and staff research may contribute substantial inventory and assessment information about the sites. This work may be done as a component of future Flood Hazard Reduction Services work in this area.

Recommendation: Develop recommendations for site restoration from inventory information

Use inventory and assessment information to develop projects to achieve a set of goals and objectives consistent with those identified for King County Ecological Lands.

The 1993 Flood Hazard Reduction Plan made several recommendations for flood reduction between RM 10.8 and 11.2 (King County 1993b, p. B-131 and 132). The Lower Cedar Basin Action Plan contains the last recommendation for acquisition (WMC 1998, p. 4-38).

Flood Hazard Reduction Plan

- *Raise and extend levees.* This option would be an unlikely candidate given that many areas that would be affected are part of King County's zero-rise floodway, and "are therefore restricted with respect to encroachment by flood control levee confinement. The upstream margin of the existing levee would still be subject to high-velocity flows and debris deposits, and the risk of levee failure would still remain."
- *Set back and extend levees.* This option would set back the levee to SE 180th Street and along the Cedar Grove Trailer Court boundary. However "due to the number of side-channel streams present

- in this bend, downstream closure of the channel is problematic, and backwater flooding within the leveed area is still likely for severe flood events... This option would still require significant encroachment within King County's zero-rise floodway, and would require purchase and removal of up to nine homes between SE 180th Street and the existing Rainbow Bend levee.
- *Elevate homes; raise county roads.* This proposal would elevate individual homes, but would still leave these homes at risk to "high velocity flows cutting side channels directly at several of the homes." The elevation of SE 180th St and McDonald Grove Road would need to be raised to secure access.
 - *Purchase and remove homes from floodway.* Purchase and remove up to 12 houses and 50-60 mobile homes from the floodway. This would "implement King County's authority under Washington State Law (RCW 86.12) to acquire properties in order to keep floodplains clear of obstructions... Properties purchased under this option would be incorporated in an open space tract operated for recreation, fisheries habitat enhancement, and floodplain management." This is also recommended in the Lower Cedar Basin Plan, which identified 30 acres of Rainbow Bend Floodplain as high priority for acquisition, between RM 10.8 and 11.2. (WMC 1998, p. 4-38)

The WRIA 8 Chinook Salmon Conservation Plan Draft Work Plan (WRIA 8 Service Provider Team 2004) made several flood control and habitat enhancement recommendations for this vicinity (Appendix F, p. 8, Reach 10 (RM 10.2 to 12.7)).

- *Lions Club Side Channel Restoration* involves restoration of a left-bank side channel at approx. RM 11.7.
- *Cedar Grove Road Mobile Home Park Flood Buyout and Levee Removal* as described above.
- *Cedar Grove Road Junkyard Buyout and Buyouts near McDonald Levee* purchase left bank parcels near RM 11.5 for levee removal and restoration. This would occur just upstream of Cedar Grove Road Natural Area.
- *Byers Reach Side Channel* involves left bank levee removal and floodplain restoration at approx. RM 12.9 (Byer's Curve revetment is left bank at approximately RM 12.7-12.8).

Future purchases of home sites within this reach would add acreage to the current Natural Area and advance the opportunity restore ecological processes, structure, and functions. These proposals though are not prioritized or scheduled for implementation in the near term.

As projects on the Natural Area are prioritized and funded by King County agencies 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: Protect the site from inappropriate uses

Recommendation: Monitor public access and use

Park staff should inspect the site monthly to determine whether there has been any dumping or other inappropriate uses. Inspection should occur regularly from SE 180st Street, and periodically from the levee access road. Given the presence of dense vegetation and wetland conditions along the road frontage, this site provides little opportunity for public access. Future acquisitions in the area are expected to add to the inventory, at which time there should be more opportunity for passive recreational access.

Objective: Contain spread of invasive vegetation

Recommendation: Monitor and contain invasive vegetation

Park staff should monitor the presence of noxious and invasive plant species at the site. If a spread in invasive species is noted, use manual control to contain the spread of invasives. When

staff time and resources are available for ongoing work, control existing invasive species at the site.

Objective: Coordinate management of future acquisitions

Recommendation: Support placing all county-owned parcels in Rainbow Bend together under a single program for management

As new acquisitions enter the inventory, it may be most practical from a site management perspective to place them all under one program for management. While a future FHRS project is planned for this area, NRL currently manages the county-owned property in Rainbow Bend and may be the appropriate manager for future acquisitions in this area.

More broadly, there could be a general policy decision by WLRD management of whether to place new acquisitions in areas of future FHRS projects into the FHRS or the NRL inventory. This decision should consider how to promote efficient management; support of ecological, public access, and flood hazard reduction goals; and future project implementation.

Implementation

Many of these recommendations pertain to 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, and FHRS). As new information is gathered for the site, restoration plans may be developed following adoption of these site management guidelines. 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	WRIA Project Coord.	CPOSA	WEAT	FHRS	NRL staff
Priority One								
Monitor and control invasive vegetation	At least monthly	X						
Monitor public access	At least monthly	X						
Priority Two								
Perform baseline inventories and assessments, and develop recommendations	Upon future acquisitions in reach	X	X	X	X	X	X	X
Update Site Management Guidelines	Within at least five years	X	X				X	X

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