

Cavanaugh Pond Natural Area Site Management Guidelines

February 2004



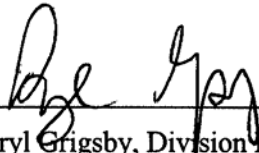
King County

Department of Natural Resources and Parks

Water and Land Resources Division

Cavanaugh Pond Natural Area Site Management Guidelines

February 2004



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King County Water and Land Resources Division



King County

Department of Natural Resources and Parks
Water and Land Resources Division

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Cavanaugh Pond Natural Area Site Management Guidelines

Summary

Site Description

Cavanaugh Pond 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.

Cavanaugh Pond Natural Area is approximately 44 acres in size and consists of four parcels. The site is located on the left bank of the mainstem Cedar River, between River Mile (RM) 5.5 to 7.0. The western boundary of the site is located at approximately ¼ mile east of Renton's city limits. The Natural Area is adjacent to the Cedar River Trail and to State Route 169, Renton-Maple Valley Road. Three of the parcels were acquired in 1976; the fourth parcel was purchased in 1990.

The Natural Area contains three separate lobes of land bounded by the Cedar River Trail to the south and meander bends of the Cedar River to the north. Two tributary streams arise in ravines on the steep valley wall to the south, flow underneath SR 169 and the Cedar River Trail, and flow through the Natural Area for a short distance to the Cedar River.

The easternmost parcel of the Natural Area includes 14-acre Cavanaugh Pond, the only Class 1 wetland on the Cedar River valley floor (mapped as Wetland 6 in the King County Wetlands Inventory). The wetland supports open water, forested, scrub-shrub, and emergent habitats. Cavanaugh Pond was created as a borrow pit from a quarry operation on the Cedar River. The source of water to this wetland is one of the tributary streams, backwater and groundwater from the Cedar River. Additional small wetlands occur on the site, but have not been inventoried or mapped by King County.

The dominant vegetation at the site is typical early-successional red alder and black cottonwood riparian forest, with a component of fairly young cedar, hemlock, and other coniferous species. The understory contains dense shrub vegetation in the three western parcels along the Cedar River Trail; this vegetation and occasional wetlands limit access to most of these parcels. The eastern parcel containing Cavanaugh Pond wetlands has more open vegetation on a levee road to the north and west side of the pond, where ongoing restoration work is directed at controlling invasive species. Invasives such as Japanese knotweed, Himalayan blackberry, butterfly bush, English ivy, tansy ragwort, and Scot's broom occur at the site.

Cavanaugh Pond Natural Area supports a variety of habitats from riparian forest to a structurally complex wetland, which provide diverse habitat for fish and wildlife. Cavanaugh Pond is noted for its populations of spawning sockeye salmon. This eastern parcel is popular viewing area for visitors to observe spawning salmon in the pond and the adjacent Cedar River. The mainstem Cedar River supports coho salmon, chinook salmon, sockeye salmon, coastal cutthroat trout, and winter steelhead.

The mapped floodplain encompasses most of the four parcels of Cavanaugh Pond Natural Area, extending south to the Cedar River Trail.

Public Use

The eastern parcel of Cavanaugh Pond Natural Area supports regular use by local foot traffic from the Cedar River Trail and by other local residents, many of whom are from the Riverbend Mobile Home Park. Use is primarily for walking and nature observation, concentrated on the area around Cavanaugh Pond. The site is used by public agency staff and volunteers for educational activities in the fall in association with Cedar River salmon educational programs. The Washington Department of Fish and Wildlife (WDFW) annually install a temporary weir at the site to collect adult sockeye for hatchery production during the fall.

The primary access to the site is on the easternmost section of land: 174th Avenue SE provides direct pedestrian access off of SR 169 and the adjacent Cedar River Trail. From the 174th Avenue entrance, a roadbed provides the main trail into the property. The road extends along the top of the river revetment to the western edge of the pond at the Cedar River. Other informal trails may exist at the site, but there is little to no access to the western parts of the property.

There is no authorized parking at the site; parking on the east edge of the site is owned by the Riverbend Mobile Home Park and parking for Natural Area use is not allowed (except under special arrangement during fall salmon education events).

There are Parks Ambassadors and Adopt-a-Park groups associated with Cavanaugh Pond Natural Area. The Adopt-a-Park group performs tasks such as invasive species removal and plantings under the direction of the Parks Resource Coordinator; the Parks Ambassador role is mainly in monitoring the site.

A new bridge over the Cedar River will be installed along the western edge of Cavanaugh Pond Natural Area; associated project work will install a detention pond on the Natural Area and re-route the Cedar River Trail through the site. This new roadway and trail location will affect the ecological condition and the public use of this portion of the site.

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 the site

Decisions about site management and public access should consider the regional significance of the 14-acres Cavanaugh Pond wetland, and the important habitat functions of the wetland and the stands of riparian forest along the Cedar River. Public access should be focused on the eastern parcel, on the established levee road leading along the north side of Cavanaugh Pond, and the cleared weir area at the end of the levee road. This area provides excellent passive recreational and interpretive opportunities, although care should be taken to ensure that informal trails do not proliferate in areas that are erosive or will negatively impact the wetland or river. This overarching recommendation is carried out through the various recommendations below.

Objective: Develop long term ecologically based protection and restoration actions

Recommendation: Perform baseline inventories and assessments

Complete 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.

Recommendation: Develop recommendations for site restoration from inventory information

Use inventory and assessment information to develop specific projects that meet the purpose and goals of sites identified as King County Ecological Lands. These projects should be developed with the input of relevant King County staff, which may include NRL, basin steward, resource coordinator, capital projects, flood hazard reduction, and ecologists.

The Lower Cedar Basin Plan, Flood Hazard Reduction Plan, and WRIA 8 Chinook Salmon Conservation Plan make a number of management recommendations in the vicinity of the site that may be considered for future recommendations. These general proposals are aimed at the multiple interests of the basin plan (flood hazard reduction, habitat quality and salmonid health, and water quality and quantity) and may or may not be in accordance with ecological land management goals. These proposals are not prioritized or scheduled for implementation.

Objective: Contain spread of invasive vegetation and maintain new native plantings**Recommendation: Monitor and control invasive vegetation**

Park staff should monitor, contain, and where possible reduce the spread of noxious and invasive plant species that are present at the sites. This work is recommended particularly in those areas where planting projects have occurred.

This work occurs using primarily manual control by Park staff and volunteer labor throughout the year. Current level of activity is 4-5 volunteer events a year, and additional staff time throughout the year.

Recommendation: Maintain existing and establish new planting projects

King County Park staff and volunteers should continue to maintain native plantings, primarily by controlling invasive species. Plantings should be observed for plant survival, and re-planted where die-off has occurred. New plantings should be installed, maintained, and monitored where feasible to control invasive species.

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 trash and respond as necessary to maintain a clean and safe property. Monitoring should occur at least monthly. Park staff should consider installing litter/dumping policy signs on the property if litter activity increases.

Objective: Allow current level of passive recreation opportunities at the site**Recommendation: Monitor public access**

Park staff should note changes in types of recreational activities at the site, 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.

Current use is passive recreation such as walking and nature observation, primarily occurring on the eastern Parcel 9100 (Cavanaugh Pond). The other portions of Cavanaugh Pond Natural Area receive limited to no use. This current use pattern is appropriate to site resources; site usage should be observed to ensure that this use pattern persists. If informal trails proliferate in areas that are erosive or will negatively impact the wetland or river, Park staff should close down those trails.

When Elliott Bridge is constructed, monitor levels of use in this portion of the property in particular.

Objective: Coordinate with King County DOT when Elliott Bridge work affects Cavanaugh Pond Natural Area property.**Recommendation: Ensure that Elliott Bridge and road construction meets conditions of applicable easements and Parks/NRL-issued permits**

NRL and Parks property management should remain in contact with King County DOT as work progresses. Conditions for special use (or other appropriate) permits for work on Cavanaugh Pond parcel 9018 should be met by project applicant.

Recommendation: Determine whether Forward Thrust conversion requirement has been met.

NRL should coordinate with CPOSA, Parks and Roads to determine whether \$53,600 was transferred to Parks to meet conversion requirement for 1997 purchase of 2.15 acres from parcel 9018. If this transaction has not occurred, funds should be transferred as soon as possible.

Objective: Evaluate if continued installation of the weir is consistent with site goals and guidance from the Ecological Lands Handbook**Recommendation: For the time remaining on the Park Alteration Permit ensure that the site is used and restored according to permit requirements following each broodstock collection season.**

Parks staff should ensure that use of site by WDFW staff for weir installation, broodstock collection, and post-weir restoration meets permit requirements. If use or restoration does not meet permit conditions, Parks Staff should notify NRL and other appropriate staff to develop an appropriate course of action to ensure that permit conditions are met.

When the permit is up for renewal in 2008, or prior to that time, if the evaluation described in the objective determines an incompatibility between weir installation and operation and site goals, the permit conditions should be modified to achieve consistency between site uses and site goals.

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Cavanaugh Pond Natural Area

Site Management Guidelines

Introduction

Cavanaugh Pond 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 Cavanaugh Pond 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

Cavanaugh Pond Natural Area is 44.18 acres in total¹, and consists of four separate but contiguous parcels on the left bank (facing downstream; south side) of the Cedar River from River Mile (RM) 5.5 to RM 7.0. The Natural Area is located on the north side of SR 169 (Renton Maple Valley Road), and extends west from the junction of SR 169 and 152nd Ave SE, through 174th Ave SE (at Riverbend Mobile Home Park). 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 parcels.

Cavanaugh Pond Natural Area lies immediately adjacent to the Urban Growth Boundary, which runs along the west and south boundaries of the site. Renton city limits extends to 149th Ave SE, ¼ mile west of Cavanaugh Pond Natural Area. Between the boundary of the Renton city limits and the park, along the north side of SR 169, a set of parcels with the designated land use “urban separator” separates Cavanaugh Pond Natural Area from the incorporated area.² South of the site across SR 169, lots in the unincorporated portion of the Urban Growth Area are zoned urban, permitting between 4 and 12 units per acre. Parcels outside of the Urban Growth Area in this vicinity are zoned one unit per five acres.

Approximately ¼ mile upstream of Cavanaugh Pond Natural Area is Ricardi Reach Natural Area. The Riverbend Mobile Home Park occupies the river frontage between Cavanaugh Pond and Ricardi Reach Natural Areas. The Ricardi Reach and adjacent Cedar Grove Natural Areas extend nearly two miles along the Cedar River just upstream of Cavanaugh Pond Natural Area, to SE Jones Road.

Publicly Owned Land in Vicinity

Several parcels in this vicinity are owned by other King County sections or departments (see Figure 2). For a list of county-owned parcels in this vicinity see Appendix 1.

Right bank: On the right bank of the river between Cavanaugh Pond parcels 9018 and 9188, the King County Flood Hazard Reduction Services (FHRS) owns five parcels (Bleifuhs pers. comm. 2004). Across from and downstream from the western portion of Cavanaugh Pond parcel 9018, the King County Roads Division (Roads) owns several parcels along the Cedar River and Jones Road, in the vicinity of 154th Ave SE. Upstream of the site in Ricardi Reach, FHRS manages two parcels and

¹ King County Parks records give acreage at 58.79 acres, but King County Assessor’s office data for parcels total 44.18 acres.

² Urban separators are permanent low-density areas within the Urban Growth Area that are to be maintained at current densities “to protect adjacent resource lands, Rural Areas, and environmentally sensitive areas.” Countywide Planning Policies, Policy LU-27, p. 18

Table 1. Cavanaugh Pond Natural Area General Information.

Best Available Address	Along SR 169, west of intersection of SR 169 and 174 th Ave SE
Thomas Guide Map Location	657 A4, B4, C4
Legal Description	Township 23 N, Range 5 E, Section 23 & 24
Acreage	58.79 Acres in Parks records; Assessor's Parcel data totals to 44.18 Acres
Drainage Basin	Lower Cedar River
WRIA	8
Council District	12
King County Sensitive Areas	Stream, Wetland, FEMA 100-year floodplain and floodway, erosion

Table 2. Cavanaugh Pond Natural Area Parcel Information.

Parcel Number	Name used in SMG*	Acreage**	Purchase Date	Ownership type/price	Previous Names	Zoning	Funding Source	Recording Number
2323059018	9018	10.13	5/1/1976	Owned In Fee, N/A	N/A	RA 5	Forward Thrust	N/A; 199711191438
2323059187	9187	3.99	5/1/1976	Owned In Fee, N/A	N/A	RA 5	Forward Thrust	N/A
2323059188	9188	11.10	5/1/1976	Owned In Fee, N/A	N/A	RA 5	Forward Thrust	N/A
2423059100	9100	18.96	12/10/1990	Owned in Fee; \$220,000	Cavanaugh Property; Cedar River Trail – Parcel 4; Cedar River Park Parcel No. 2	RA 5	Open Space Bond	199101100628 199101100629

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

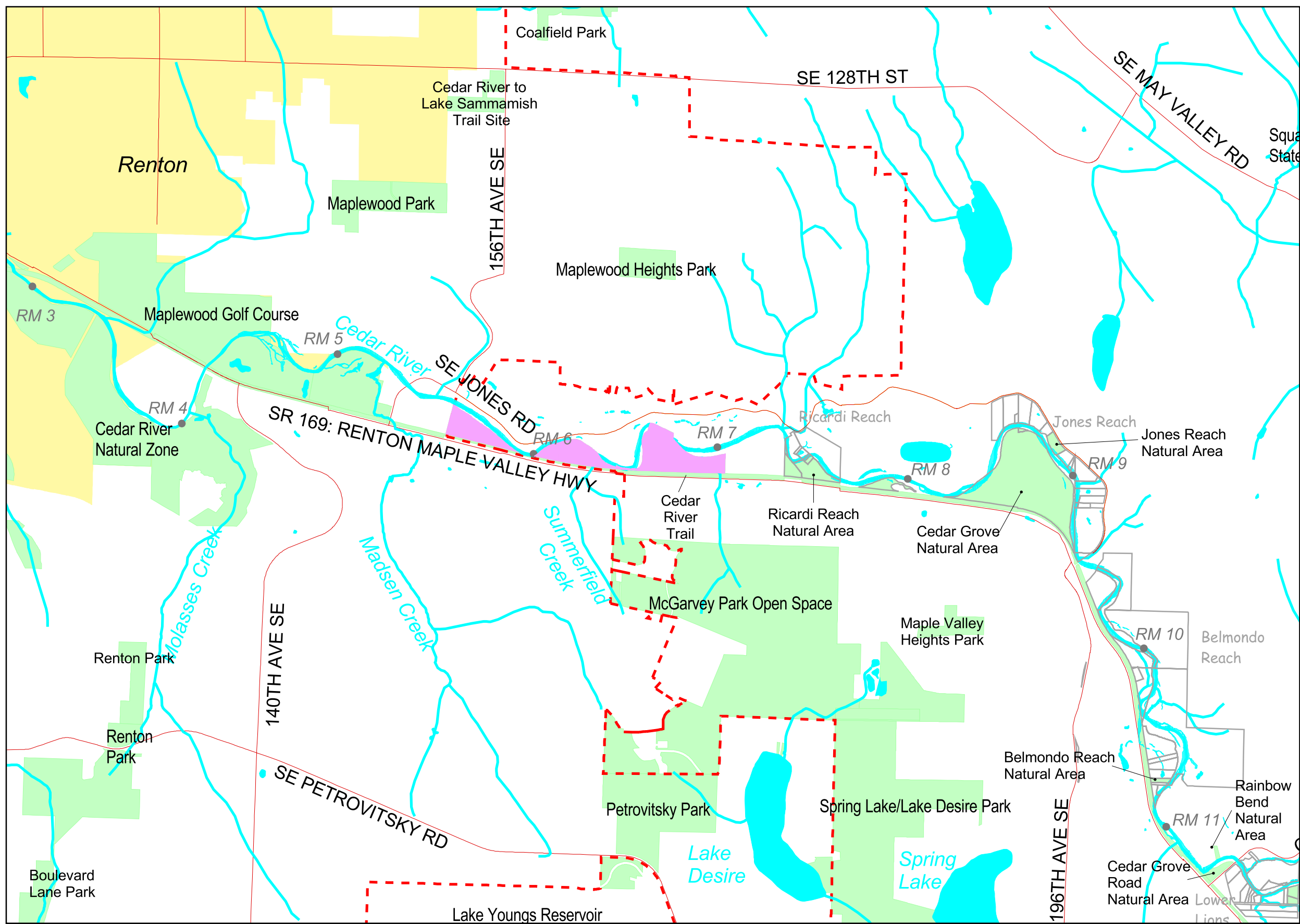
** Acreage and purchase date from King County Assessor's data.

Roads manages one parcel (Bleifuhs pers. comm. 2004 and Jaramillo pers. comm. 2004).

Left bank: Roads purchased 2.15 acres of the western portion of Cavanaugh Pond Natural Area parcel 9018 in 1997. This section of land was never given a parcel number but is described in the recording deed (199711191438) and is labeled on Figure 2. Roads also owns two parcels just downstream of 149th Ave SE; FHRS and Roads cost-shared on three additional parcels in this area.

Roads' parcels were purchased in association with the Elliott Bridge Replacement project. This project will replace the current 149th Ave SE bridge with a new bridge that connects 152nd Ave SE with 154th Ave SE. This bridge will run on the west side of the Cavanaugh Pond Natural Area parcel-9018 through the area purchased in 1997 by Roads. Many of Roads' other parcels in the area were purchased to perform mitigation or restoration for capital project work in the area (King County 2003b; Jaramillo pers. comm. 2004). FHRS-owned parcels may be used in the future for levee modification or floodplain restoration; activities that take place at these sites may affect the river's hydrology at Cavanaugh Pond. Appendix 1 lists parcel numbers for these parcels owned by other King County agencies. Appendix 2 provides plans for the Elliott Bridge Replacement.

There are several other publicly owned lands that provide open space or recreation opportunity in the vicinity. Downstream of Cavanaugh Pond Natural Area, within Renton city limits, several miles of the river are part of the Renton-owned Cedar River Regional Park, the Maplewood Golf Course, and the Renton-owned Cedar River natural zone. Collectively these areas extend from RM 5.5 to 1.5 (at Interstate 405). Three large multi-use King County Parks are located on the plateau south of the Cedar River valley floor: McGarvey Park, Petrovitsky Park, and Spring Lake/Lake Desire Park. These 850 contiguous acres are located on the south side of SR 169 from Ricardi Reach and Cedar Grove Natural Areas, separated by a tract of rural-zoned parcels 1/3 mile wide. The 16-mile Cedar River Trail between Renton and Landsburg runs on the south side of Cavanaugh Pond Natural Area.



Legend

-  River Reach Boundaries
Lower Cedar River reach extents are designated by Cedar River Legacy Program
-  River Mile Markers
-  Cavanaugh Pond Natural Area
-  Public Recreation Lands
-  Rivers and Lakes
-  Streams
-  KC Urban Growth Area
-  Streets
-  Municipal Boundaries



April 4, 2004
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Figure 1

Vicinity Map

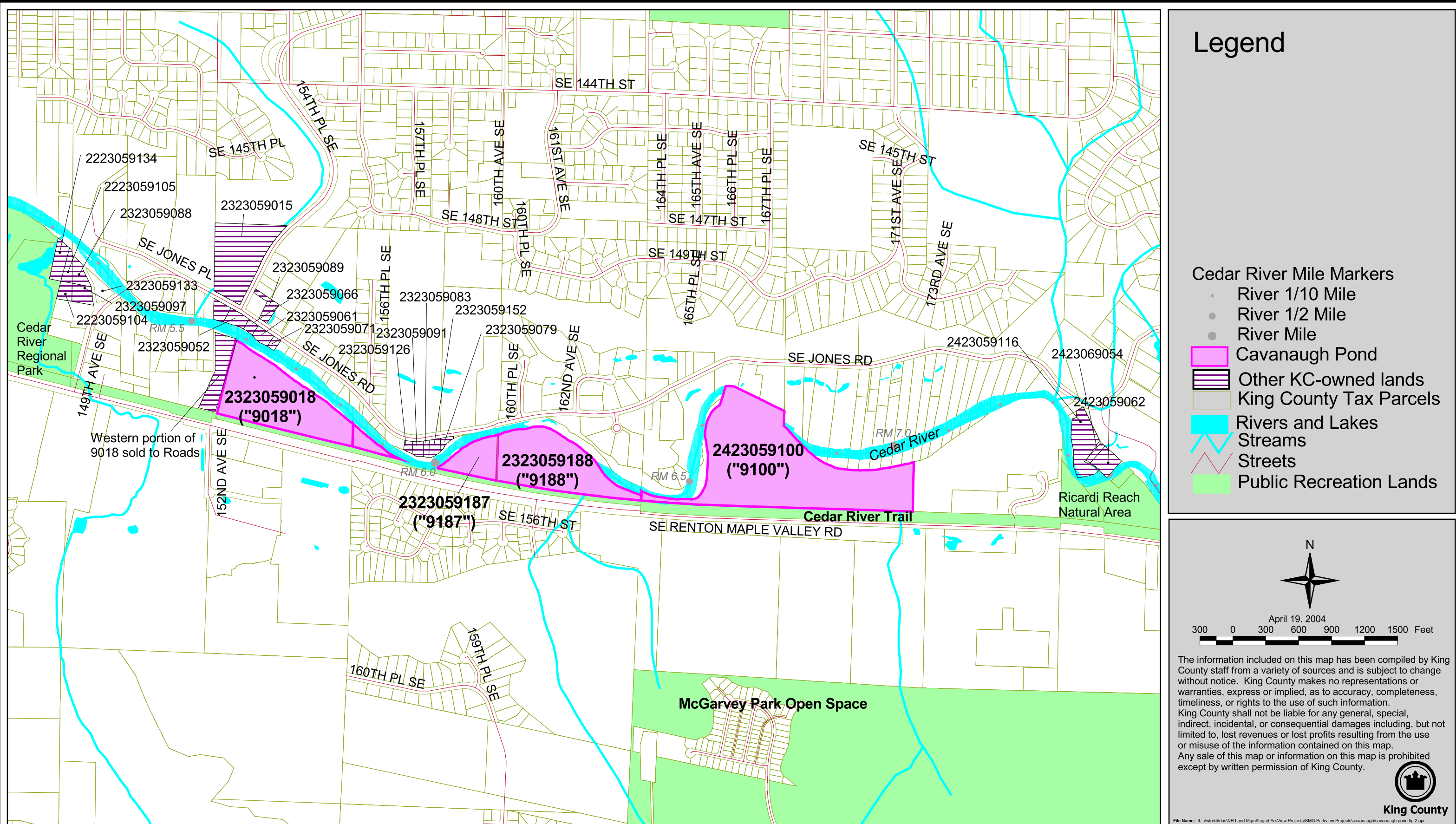


Figure 2

Cavanaugh Pond Natural Area: Parcel Numbers (names used as parcel references noted in parentheses)

Part 2. Acquisition History, Funding Source and Deed Restrictions

Parcels 9018, 9187, 9188

Three of the four parcels (9018, 9187, 9188) currently in the Cavanaugh Pond Natural Area inventory were purchased in May 1976 using Forward Thrust Bond funding.

Forward Thrust was a major King County works program with bond proposals encompassing transportation, community, housing, water issues, and other publicly financed capital improvements. On February 13, 1968, voters approved Proposition 6 (authorized by King County Council Resolution 34571), a \$118 million bond proposal for the purchase, creation and improvement of parks throughout King County. The Forward Thrust Bond Initiative allocated \$825,000 for the acquisition of 250 acres for Regional Parks in various sites in the Cedar River Valley between Renton and Maple Valley. Regional Parks are intended to provide outdoor recreation opportunities to a regional population; development is not to detract from scenic or natural characteristics of the area (King County 1975). The regional park along the Cedar River in Renton, Washington was intended to be a “family oriented park [that] will include parking, active playing fields, and passive quiet areas.” (King County 1979) The mandates for parking and active recreation were satisfied in other portions of the acquisition, on lands that are currently used for active recreation owned by the City of Renton two miles west of the site.³ There is no specific information about purchase price or acquisition available in Parks Archive files for this site. In general, Forward Thrust purchases on the Cedar River did not have any explicit restrictions placed in the title deeds

Restrictions on conversion of these lands are identified in Section 7 King County Resolution 34571.

“Public Park and Recreation Facilities acquired, developed, constructed or improved by the County or any City in whole or in part from the proceeds of the bonds authorized pursuant to this resolution shall not be transferred or conveyed except by agreement providing that such lands shall continue to be used for the purposes contemplated by this resolution, or be converted to a different use unless other equivalent lands and facilities within the County or City shall be received in exchange therefore. The proceeds of any award in condemnation applicable to such Public Park and Recreation Facilities shall be used for the acquisition or provision of other equivalent lands and facilities. However, nothing in this resolution shall prevent the grant of easements or franchises or the making of joint use agreements not incompatible with the use of Public Park and Recreation Facilities for the purposes of this resolution.” (Section 7)

The western 2.15 acres of parcel 9018 were sold to the King County Department of Transportation in 1997 (Recording Number 199711191438). This sale is a conversion under Forward Thrust guidelines, which should be compensated for through purchase of equivalent lands. Discussion of the sale and issues regarding compensation is attached as Appendix 3 to this document.

These parcels may have river protection easements in areas where levees or revetments occur (see Part 4 below and Figure 3 for levee/revetment locations), but due to the time since acquisition the title information is not available for these parcels. While these parcels were in private ownership in the 1960s, river protection easements may have been purchased by what is now the King County Flood Hazard Reduction Services group (FHRS). A King County river protection easement no longer exists once King County purchases the property. If the FHRS group determined that they indeed had a river protection easement, if the property is transferred to another King County Division or Department for management, WLRD management would 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

³ Acquisition documents for Cedar Grove parcels denote that many were part of an IAC project “Cedar River Regional Park Site.” However, current records of IAC grants to King County do not list a project of this name, which is accurate to the best knowledge of Park staff (Eksten pers. comm. 2003).

the future, King County would need to make sure it retains a river protection easement. Further information about the flood facilities and about WLRD policy on FHRS access and maintenance of flood facilities is provided in Part 4.

Parcel 9100

The fourth parcel (9100) was purchased in December 1990/January 1991 to acquire interest in the Cedar River Trail section of the property, and to protect high quality fish and wildlife habitat. This parcel was assessed at \$240,000. It was acquired using \$220,000 of Open Space Bond funding; the Cavanaugh family donated the additional \$20,000 in value to the county, with the requirement that the site shall be designated “Cavanaugh Cedar River Park” (as stated in the statutory warranty deed). The Cavaughns also conveyed to King County a Quit Claim deed for Railroad Right-of-Way (currently the Cedar River Trail).

King County voters authorized the \$117,640,000 King County Open Space Bond initiative, described in King County Ordinance 9071, in November 1989 to provide funds for the acquisition, development, renovation and improvement of public green spaces, green belts, open space, parks and trails in King County. Specific goals included preserving wildlife, enhancing scenic vistas, providing access to the water and open space, and providing trail connections between virtually all the cities in King County to a regional trail system and trails within the suburban cities and unincorporated areas of King County (King County 1989). King County Ordinance 9071 authorizes reclassification of bond funds in Section 8, part C. Restrictions on conversion associated with Open Space Bond funds are identified in Section 8, part D.

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

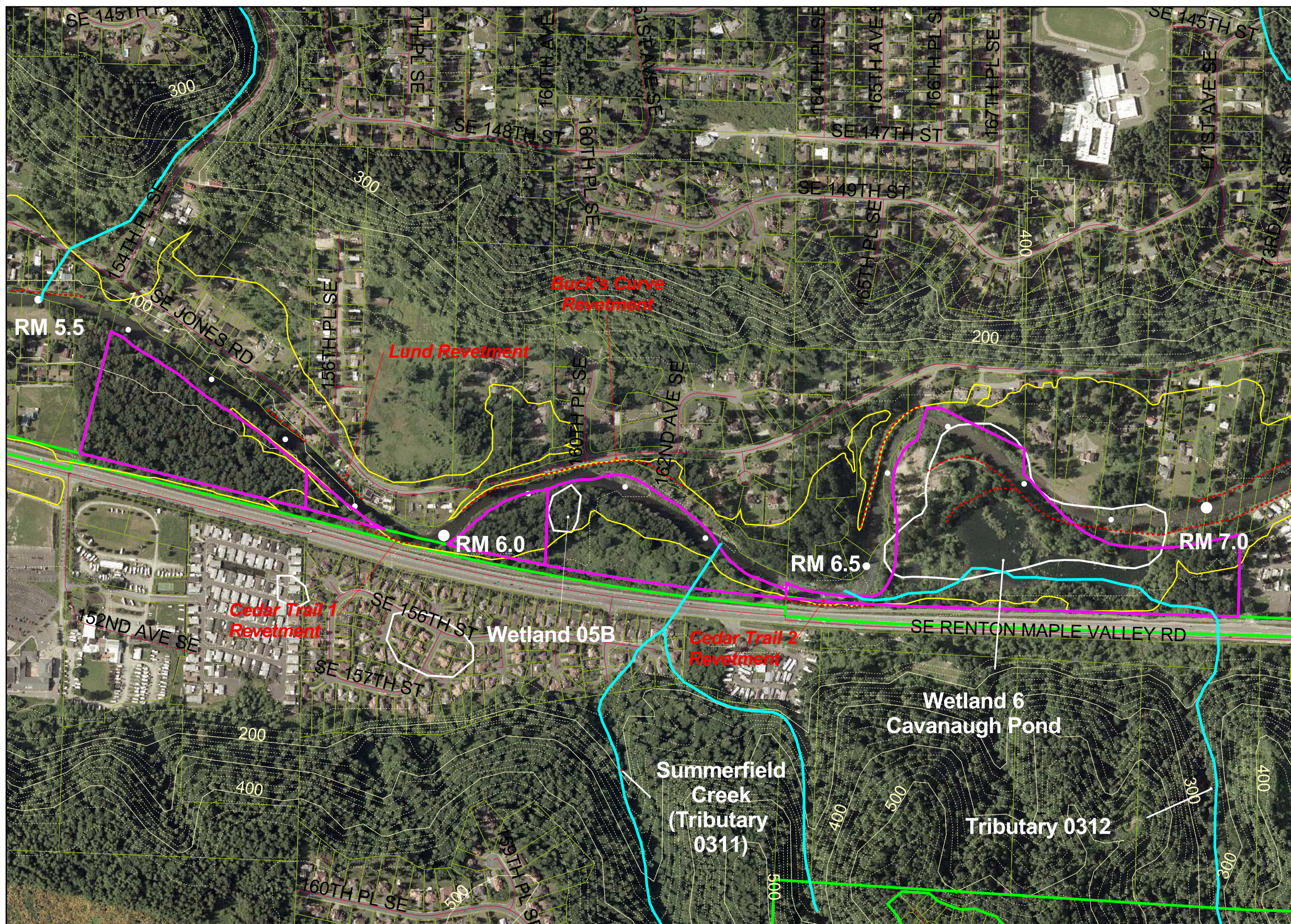
Although full title information is not available for this parcel in association with the 1990 purchase, the Statutory Warranty Deed notes that the purchase is “subject to easements, restrictions, reservations and provisions of record, if any.” Easements may include river protection easement(s) as discussed with above parcels. Further information about the flood facilities and about WLRD policy on FHRS access and maintenance of flood facilities is provided in Part 4.

Part 3. Ecological and Physical Setting

This section describes the natural resources and ecological processes present at Cavanaugh Pond Natural Area. This section describes existing conditions; further analysis will be provided in Part 6 below. Refer to Figure 3 for site natural resource information discussed below.

Topography and Soils

This Natural Area lies within the floodplain of the Cedar River, with little topographic variation at the site. The valley of the Cedar River is very narrow (less than ¼ mile wide) just upstream of this area, confined between steep slopes south of SR 169 and on the north (right) bank of the Cedar. As the river curves around the Cedar Grove Natural Area peninsula, the valley widens to close to ½ mile in width, bounded by SE Jones Road and SR 169 at the edges of the slope. The properties across from Cavanaugh Pond Natural Area are at approximately the same elevation as the site.



Legend

- River Mile Markers
 - River 1/10 Mile
 - River 1/2 Mile
 - River Mile
- Cavanaugh Pond
- Levees and Revetments
- Floodplains - 100 year
- Wetlands
- ~ Streams
- ~ Streets
- ~ 20 ft Contour Lines
- ~ 100 ft Contour Lines
- King County Tax Parcels
- Selected Public Lands



April 5, 2004
 200 0 200 400 600 800 1000 Feet

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Wetland, Floodplain, Stream, and Topographic layers are approximate, mapped from King County GIS



King County

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Figure 3

Cavanaugh Pond Natural Area: Site Features

The parcels within Cavanaugh Pond Natural Area comprise three separate land areas bounded by the Cedar River Trail and SR 169 to the south and the meanders of the Cedar River to the north.

The King County soil survey maps Puyallup fine sandy loam and Riverwash soils at the site (Snyder et al. 1973).

- Puyallup soils are well-drained, located on “the natural levees adjacent to streams in river valleys,” found at low elevations with 0-2% slopes. Permeability is moderately rapid, but they may contain poorly drained inclusions of soils.
- Riverwash are “long, narrow areas of sand, gravel and stones along channels of larger streams.” If vegetated, common species include cottonwoods or willows. “Overflow and alteration by severe erosion and deposition are frequent.” The area of riverwash soils is mapped as a narrow band along the stream corridor.

Hydrology and Channel Morphology

Cedar River

Cavanaugh Pond Natural Area is located between RM 5.5 and 7.0 on the left bank (facing downstream) of the Cedar River.

Research and analysis has been conducted using maps and aerial photographs to describe historic change in channel characteristics (King County 1993a; also Perkins 1994). These studies classified the Lower Cedar River into eight river reaches. According to Perkins (1994), reaches were selected based on morphology and slope. The Current and Future Conditions Report classified the river at Cavanaugh Pond Natural Area as two reaches: RM 4.2-5.8, and RM 5.8-9.4 (RM 9.8 in Perkins) (King County 1993a, p. 5-22; Perkins 1994). The Current and Future Conditions Report describes historic conditions in this reach as follows:

- Reach RM 4.2-5.8: This reach “was characterized by multiple channels, braiding, and major changes in position between 1865 and 1936... The width of the meander belt ranged from 400 to 1,000 feet in this reach in 1936...by 1989 the outside banks of all river bends in this reach were anchored in position by revetments or the valley wall.” (King County 1993a p. 5-28)

Perkins indicates that the 1895 active channel width was 260 feet; the 1989 active channel width is 110 feet. The natural degree of confinement was “unconfined,” but the current level of hydrological modifications is “high.” Wetted channel width has decreased from a maximum of 169 feet and minimum of 91 feet in 1895 to a maximum of 99 feet and minimum of 82.5 feet in 1989. Historic pool frequency has decreased from “high” in 1895 to “low” in 1989 (Perkins 1994; Blair 2003).

- Reach RM 5.8-10.0: This reach “was historically braided and the meander belt was ¼ mile wide...This reach has narrowed to less than half its 1936 width due to filling the floodplain and levee/revetment construction. In many places levees or revetments line both banks, preventing flows from spreading over the floodplain and thereby creating extremely high velocities that severely damage revetments... Rapid channel migration could occur in the future...Eventual failure of revetments would allow the river to reoccupy old channels on the floodplain” (King County 1993a, p. 5-28)

Perkins indicates that the 1895 active channel width was 220 feet; the 1989 active channel width is 110 feet. The natural degree of confinement was “unconfined,” but the current level of hydrological modifications is “high.” Wetted channel width has decreased from a maximum of 143 feet and minimum of 77 feet in 1895 to a maximum of 99 feet and minimum of 82.5 feet in 1989. Historic pool frequency has decreased from “high” in 1895 to “low” in 1989 (Perkins 1994; Blair 2003).

The mapped FEMA 100-year floodplain indicates areas expected to be inundated during the estimated 100-year flood event (the GIS layer of the 100-year floodplain layer on Figure 3 is approximate). The

mapped floodplain encompasses most of the four parcels of Cavanaugh Pond Natural Area, extending south to the Cedar River Trail. The mapped floodplain extends approximately 0.1 miles north of the river, up to or across SE Jones Road.

There are no mapped side channels to the mainstem in this area. “There are several sand and gravel bars that are submerged during the wet season and act as scattered islands during the dry season when the water level is lower. These islands fall under the jurisdiction of the Washington Department of Natural Resources.” (King County 2003b p. 23)

Tributaries

Two tributaries flow into Cavanaugh Pond Natural Area from the south, listed as unclassified streams in the King County Sensitive Areas Folio (King County 1990). These tributary streams, as mapped, both originate at the head of the steep valley walls to the south, and flow approximately 1 mile through ravines, underneath SR 169 and the Cedar River Trail, and through the site for a short distance before their confluence with the Cedar River.

Tributary 0311 is called Summerfield Creek in the Current and Future Conditions Report. Summerfield Creek flows from the southern valley slopes through the Summerfield subdivision, and enters Cavanaugh Pond Natural Area just east of SE 161st Street. This small subbasin is noted to have 33% conversion from forest cover to urban development. A stormwater diversion pipe diverts runoff from the upper half of the basin, which reduces the flood peak levels of this stream (King County 1993a, p. 3-29). The lower ¼ mile of the stream before the Cedar River has historically experienced landsliding and erosion problems (King County 1993a, p.4-22).

Tributary 0312 flows to the eastern edge of Cavanaugh Pond. The Current and Future Conditions analysis (King County 1993a) notes that Tributary 0312 may have high sediment levels. Further information is provided in discussion of Cavanaugh Pond below.

The Current and Future Conditions Report notes that in this vicinity “the highway and fill under the Cedar River Trail (formerly a railroad bed) appear to have altered hydrology of this area of the floodplain by confining floodwaters within a narrow portion of the valley and concentrating drainage from the south wall through cross culverts.” (King County 1993a, 7-81)

Wetlands

Cavanaugh Pond itself is located on parcel 9100, between RM 6.5 and 7.0. Cavanaugh Pond is also known as Wetland 6 in the King County Wetlands Inventory (King County 1991). This is the only Class 1 wetland on the Cedar River valley floor, listed as a Regionally Significant Resource Area for King County (King County 1993a, p. 7-79).⁴ The 14-acre wetland supports open water, forested, scrub-shrub, and emergent habitats. Cavanaugh Pond is approximately 3.8 hectares in size, with an average depth of 2.0 meters and maximum depth of 3.1 meters. (Hall 2002)

The Current and Future Conditions Report describes Cavanaugh Pond hydrology as follows:

“Cavanaugh Pond has three sources of water: flows from Tributary 0312...; occasional backwater from the mainstem Cedar River during high flow conditions; and groundwater upwelling from the river. Water leaves [Cavanaugh Pond] through a small outlet channel at the south end, which cuts through a gravel bar along the left bank of the river at RM 6.4....[The pond outlet is constricted by a beaver dam, which helps to maintain water levels in the pond; the outlet point allows backwater during high flows.]...Because of groundwater upwelling and a sheltered location

⁴ “RSRAs are those portions of watersheds that contribute to the resource base of the entire Puget sound region by virtue of exceptional species and habitat diversity and abundance when compared to aquatic and terrestrial systems of similar size and structure elsewhere in the region. RSRAs may also support rare, threatened or endangered species or communities.” (2000 King County Comprehensive Plan Glossary)

behind the adjacent revetment, water in [Cavanaugh Pond] remains relatively clear and non-turbulent during flooding conditions. Under normal flow conditions, the water along the north shoreline is crystal clear.” (King County 1993a, 7-79 and 7-81)

A small wetland (wetland 05B) is mapped by the National Wetlands Inventory on the site as palustrine scrub shrub wetland; this wetland was not inventoried in the King County Wetlands Inventory (Figure 3).

There are additional wetlands on site that have not been mapped in the King County wetlands inventory. Relic side channels of the Cedar may now support depressional wetland areas, such as the small palustrine scrub-shrub wetland in a former side channel on the western portion of Cavanaugh Pond-9018. This wetland was described and mapped as Wetland Din the Elliott Bridge Replacement FSEIS; this wetland will be impacted by bridge construction (King County 2003b, p. 50).

Vegetation

The site predominantly supports mature red alder and black cottonwood forest with a small proportion of coniferous overstory trees, as is typical along the riparian zones of this section of the river. The understory contains native species (including a wide variety of shrubs such as willows, salmonberry, Indian plum, snowberry, currants, roses, red osier dogwood, cascara, and vine maple).

The typical riparian forest in this vicinity is described in the Elliott Bridge FSEIS (King County 2003b, p. 47-48). The forest is dominated by black cottonwood and red alder, much of which occurs within the 100-year floodplain of the Cedar River. The FSEIS contains a riparian forest survey as Appendix E, which may be a useful source of site information for planning future restoration activities.

“A portion of the habitat type [on parcel 9018] is dominated by mature black cottonwood, with trees approaching 100 years or more in age with trunk diameters of 31 inches. Common understory species include willow, red-osier dogwood, japanese knotweed, reed canarygrass, creeping buttercup, salmonberry and pig-a-back. Vine maple and sword fern are found on hummocks or in areas with slightly higher elevations. Soils in the riparian forests immediately adjacent to the river consist of well-drained cobble, gravel, and sand river-wash deposits that do not display hydric (wetland) soil characteristics.”

The three eastern parcels (9100, 9187, 9188) support a high proportion of invasive species in their understory, primarily consisting of Japanese knotweed, Himalayan blackberry, butterfly bush, and English ivy, with Scot’s broom along the Cedar River Trail. The westernmost parcel (9018) supports relatively intact native vegetation, other than a limited amount of scot’s broom and English ivy. A limited amount of tansy ragwort is present, scattered throughout the parcels at the site though concentrated in areas of regular use. The plant is controlled by hand-pulling by Parks staff and volunteers. No other King County-listed noxious weeds for which control is required have been identified at the site.

The Current and Future Conditions Report provides the following description of wetland vegetation at Cavanaugh Pond:

“Wetland 6 contains an exceptionally diverse array of habitats. The margins of the wetland are mostly dominated by alder and salmonberry, although a dense stand of willow exists along the southern shoreline near the outlet. A marshy emergent zone dominated by water parsley cover an alluvial fan at the east end of the wetland formed by sediment from Tributary 0312. Another zone of marsh vegetation can be seen at the southwest corner of the wetland, which is densely vegetated by cattails and other emergent plants. The entire wetland is surrounded by an upland deciduous forest that also contains immature cedars and hemlocks.” (King County 1993a 7-79)

Recent restoration projects have focused on reducing the presence of non-native species, and establishing conifer understory and native species diversity. Much of this work has occurred on the eastern parcel (9100) of the property around Cavanaugh Pond, as well as at several other sites on the property including along the Cedar River Trail revetments, and at a number of other areas on the middle and westernmost

parcels (9018, 9187, 9188). More information is provided under Part 5 Site Management Chronology below.

This riparian system is dominated by these early-successional species in areas where channel migration has typically occurred. Flood control activities in the late 1960s may have a long-term impact on the vegetation of the riparian corridor by reducing the area of the corridor under direct influence of river dynamics. Large-scale flood events may disturb vegetation and affect successional patterns.

Fish and Wildlife

The mainstem Cedar River supports coho salmon, chinook salmon, sockeye salmon, coastal cutthroat trout, and winter steelhead (Kerwin 2001, p. 329). The Cedar River is used for spawning, foraging, and rearing life cycle stages of Cedar River salmon and trout as well as a migration corridor (King County 2003b, p. 53) The Elliott Bridge Replacement FSEIS provides extensive discussion of salmonid/fish use and instream and riparian habitat conditions in this vicinity. Noteworthy is that “the highest concentration of chinook salmon redds (egg nests) observed in the Cedar River in 1999 were within approximately 300-foot reach of the river located beneath the preferred bridge alignment.” (King County 2003b, p. 59)

The Current and Future Conditions Report notes that Cavanaugh Pond provides “exceptionally high quality salmonid spawning, rearing, and refuge habitat.” (King County 1993a, p.7-79) Cavanaugh Pond supports large populations of sockeye salmon spawning in the fall. The Washington Department of Fish and Wildlife (WDFW) regularly maintains openings in the beaver dam at the outlet of the pond during the fall spawning season to allow fish passage into the pond. WDFW in conjunction with Seattle Public Utility staff annually install a broodstock collection weir west of Cavanaugh Pond to collect spawning sockeye from the mainstem Cedar River for use at the Landsburg sockeye hatchery (see “Weir” in Part 4 below). Additional species inventoried in Cavanaugh Pond include juvenile chinook and coho salmon, cutthroat and steelhead/rainbow trout, sculpin species, largescale suckers, bridgelip suckers, and 3-spine stickleback. (Hall 2002)

The Lower Cedar Basin Plan provides the following description of fish and wildlife use at Cavanaugh Pond (parcel 9100):

“SWM staff have observed large numbers of sockeye spawning at this location from December through January. The open water and large numbers of salmon carcasses found at this time also attract other animals, including raptors and large numbers of migratory waterfowl. SWM staff also observed a beaver lodge and other evidence of beaver activity, as well as signs of predation on salmon carcasses and birds during a 1991 field visit. As noted in the Wetland Inventory, this site forms excellent potential bald eagle habitat.” (King County 1993a, p.7-79)

The Elliott Bridge FSEIS provides the following description of fish and wildlife habitat values of the riparian forest (King County 2003b, p. 47):

“Riparian forests provide moderate to high fish and wildlife habitat values. The forests have high structural complexity, characterized by several tree canopy layers as well as shrub and herb/forb layers, which provide a variety of habitats for birds and wildlife. Of particular importance are the mature black cottonwood trees that form the upper canopy layer. These trees provide perching and potential nesting sites for raptors such as bald eagles. Proximity to the Cedar River makes riparian forests important to fish habitat. They provide shade, cover, and food for fish, as well as a source of naturally recruited wood to the river. The forests also have high flood control, erosion control, water quality, water storage, aesthetic, and recreational values.”

The following sensitive, threatened, or endangered wildlife species may occur in this vicinity: bald eagle (threatened under federal Endangered Species Act (ESA)), great blue heron (priority species by WDFW), osprey (priority species by WDFW), pileated woodpecker (sensitive species by WDFW), and chinook salmon (threatened under ESA).

Additional information about fish and wildlife habitat conditions may be found in the Elliott Bridge Replacement FSEIS:

- The “Plants and Animals” chapter on pages 45-83 includes information on riparian and in-stream habitat conditions, wetlands, plants, fish, and wildlife in the vicinity, environmental impacts of the bridge replacement, and associated mitigation of environmental impacts.
- FSEIS Appendix G in the FSEIS provides detailed analysis of salmonid use of the river in this vicinity in an “Existing Fish Habitat Conditions” report (King County 2003b).
- FSEIS Appendix F is the “Bald Eagle Survey and Wintering Habitat Evaluation.”

Part 4. Public Use and Infrastructure

This section describes public use, access points, and site infrastructure such as trails, roads, and utilities at Cavanaugh Pond Natural Area.

Public Use

Cavanaugh Pond Natural Area supports regular use by local foot traffic from the Cedar River Trail and by other local residents, many of whom are from the Riverbend Mobile Home Park. Use is primarily for walking and nature observation. The eastern parcel (9100) is used extensively for environmental education in the fall through the Cedar River Naturalist program and similar efforts, when visitors observe spawning salmon in the Cedar River and Cavanaugh Pond. Beaches on the western bank of this parcel are used during the summer time, accessible off the Cedar River Trail.

The Parks Interpretive Master Plan (Draft) (King County 2002) identifies “high potential for effective interpretive opportunities” at the site. Ideas proposed in the interpretive master plan include an orientation panel at the entrance, a signed or guided nature trail, and parking.

The site experiences frequent public dumping, particularly at the access point on 174th Avenue SE. Litter, dumped yard waste, and trash are regularly collected by Parks staff. Litter collection is also required on the beaches and parts of the interior of the site. There are no public litter collection facilities at the site. The site has a park rules sign at the entrance gate.

There are Parks Ambassadors and Adopt-a-Park groups associated with Cavanaugh Pond Natural Area. The Adopt-a-Park group performs tasks such as invasive species removal and plantings under the direction of the Parks Resource Coordinator; the Parks Ambassador role is mainly in monitoring the site.

Access, Trails and Roads

The primary access to the site is on the easternmost section of land; there is little to no access to the western parts of the property. 174th Avenue SE provides direct access off of SR 169 and the adjacent Cedar River Trail. There is no authorized parking at the site; parking on the east edge of the site is owned by the Riverbend Mobile Home Park.

From the 174th Avenue entrance, a roadbed provides the main trail into the property. The road extends along the top of the river revetment to the western edge of the pond at the Cedar River. Other informal trails may exist at the site, but these do not provide any alternative main routes into the site. The main roadbed trail is an informal trail that is maintained by regular use only.

There are informal trails that lead into the site from the Cedar River Trail, particularly to access the beaches on the eastern parcel (9100). These are not maintained as access points or established trails.

There currently is no access to the western side of parcel 9018; the Elliott Bridge replacement will introduce access to this parcel from the Cedar River Trail and the roadway along the western edge of the parcel.

Levees and Revetments

Most of the levees in this vicinity were constructed by King County during 1960s flood control work (see Cedar River Collective Chapter for more information). However, the levees along Cavanaugh Pond may date to the period of mining at the site (see Part 5 below).

- The Riverbend Upper, Riverbend Lower, and Riverbend Extension revetments run along the north extent of Cavanaugh Pond, separating the pond from the Cedar River (see Figure 3). These revetments extend west from the Riverbend Mobile Home Park east of the Natural Area.
- The Cedar Trail Revetments 1 and 2 are located in the narrow sections of the property where the river meanders close to the Cedar River Trail.
- Additional revetments on the right bank of the river affect the flow of the river through this vicinity (Brassfield Maxwell Guth Revetment, Herzmann Levee, Buck's Curve Revetment, Lund Revetment, Tobacco Datson Revetment, and Orting Hill Revetment).

As noted in Part 2, King County FHRS may have acquired river protection easements on parts of these four parcels when they were in private ownership. Although the river protection easement would no longer be 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 facilities 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).

Weir

As noted in Part 3, the Washington Department of Fish and Wildlife (WDFW) annually installs a broodstock collection weir just upriver of the outlet of Cavanaugh Pond to collect adult sockeye for hatchery production. The weir and operations are in place from approximately early September to early December depending on flow conditions. The weir spans the width of the channel and is anchored on the riverbed and both banks of the river. Weir installation involves clearing any vegetation from the riverbanks that has begun growing or woody debris that has begun accumulation in the interval between broodstock collection seasons. A temporary base of operations is also established in the floodplain area adjacent to the weir. During the time the weir is operational, a port-a-potty, live-in trailer, and space for the hatchery truck and other vehicles is maintained to accommodate these uses. (Bikle pers. comm. 2004)

In operating the weir, WDFW has developed protocols about how often and under what circumstances chinook, steelhead, and other salmonids are allowed to pass above the weir. The intent of the protocol is to minimize negative effects on chinook migration. The effectiveness of the protocol depends on who is operating the weir, their knowledge of the protocol, their ability to identify chinook, size of the sockeye run, and other factors of weir operation. (Bikle pers. comm. 2004)

Weir installation and operation is governed by a Parks Special Use Permit, which stipulates conditions for site use. The permit has the following conditions (King County 2003c):

- “If at any time the operation and/or maintenance of the fish trap creates a condition which could pose a hazard to park users, the permittee will be responsible for posting temporary signage, using barricades, or taking other appropriate measures to facilitate continued safe use of the park.
- “The permittee will restore the park property to its original or better condition as set by the designated Park Department representative.
- “The permittee will be responsible for the removal and disposal of all construction debris resulting from the work authorized by this permit and as directed by the designated representative of the Parks Department.
- “The permittee will be responsible for all ongoing maintenance and repair costs and the removal of river debris collected at the site as a result of the operation of the fish trap.”

The designated Parks Department representative is the Parks Resource Coordinator. The current Parks Alteration Permit is set to expire in June 2008.⁵

In past years, WDFW may not have performed the required restoration work to meet permit conditions following their use (Larsen 2000). According to a letter from the Parks Department sent in 2000, the permit requires restoration to occur after broodstock collection has been completed each year, with more extensive restoration work after the final season of weir operation as specified in an associated clearing and grading permit (Larsen 2000). However, recent site use has met expectations of permit conditions (Harig pers. comm. 2004).

The Parks Department letter also indicated concern as to whether WDFW would clarify whether the weir is included in Seattle Public Utilities’ Incidental Take Permit for its Habitat Conservation Plan (to confirm that King County has not assumed any legal liability for take) (Larsen 2000). There is no record in Parks property files or knowledge by the Basin Steward that this confirmation has been received (Bikle pers. comm. 2004).

The Parks Department letter also noted that “the land in which the weir has been located is not a good candidate for a permanent site, in part because it was purchased with Forward Thrust bonds. This does not allow permanent uses that are not recreational or educational.” (Larsen 2000)

Part 5. Site Use Chronology

Cavanaugh Pond was the borrow pit from a quarry operation on the Cedar River (King County 2002 p. 58). The sand and gravel excavation reached approximately twenty-two feet below the water table (Lietz 1990 Item 3J). Most of the levees/revetments in the area were constructed during the 1960s flood control efforts along the Cedar River, as indicated in Part 4 above. The main revetment along Cavanaugh Pond pre-dates these efforts and probably was established during the mining operations.

Restoration Work

Invasive species comprise a large proportion of the understory layer on Parcel 9100. Restoration work over the several years has been directed to reduce the presence of Himalayan blackberry, Japanese knotweed, and reed canarygrass, and to establish a conifer understory and native species diversity. Much of the recent work has been focused on the accessible eastern portion of the site, along the revetment and riverbank extending between the river and Cavanaugh Pond. Project work has included cutting back plants, mulching with cardboard and woodchips, removing rootballs, and planting conifers to create a competitive overstory.

⁵ Permit has been filed with Cedar River Trail permits in Parks files (S-75-93, S-106-97, S-115-93).

These projects require regular investments of staff and volunteer hours just to maintain existing projects. A large portion of this work has been directed by the site Resource Coordinator, using volunteer labor and Parks staff. Resource Coordinator and Parks staff volunteer events include invasive removal around plantings approximately 4-5 times per year, and planting of additional 200-500 trees per year in 2-3 events per year, primarily occurring in October through June. Additional King County-sponsored volunteer events have worked on this area, and the Adopt-a-Park group is active in invasive removal and other enhancement activities.

The King County Habitat Partners Program worked for several years between 1995 and 2001 planting salvaged native plants in the vicinity of Cavanaugh Pond. These plantings were not maintained nor monitored for survival. (Rabourn pers. comm., 2003) Jobs for the Environment crews cleared knotweed and laid cardboard and weed control material at the site in 2000/2001, although this project has not been maintained by JFE. (Harig pers. comm., 2003) King County has also installed a Small Habitat Restoration Project in 2003 to remove reed canary grass from spawning gravel and plant native vegetation in 3000 square feet of buffer along Cavanaugh Pond. (Bowles pers. comm., 2003).

Cedar River Trail revetments have been planted by the Flood Hazard Reduction Services section of King County. These plantings are monitored and maintained by FHRS. (Koon pers. comm., 2003)

Additional plantings of native species have been installed in the past at several sites on the middle and westernmost parcels 9018, 9187, 9188 (accessible by informal paths leading into the site from the Cedar River Trail). These plants may have been installed through earlier volunteer or staff efforts for which there are no records.

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 Cavanaugh Pond 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

There are significant gaps in how much is known and understood about ecological conditions and physical processes in Cavanaugh Pond Natural Area 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. The site inventory, assessment, or evaluations of proposed actions should be conducted by those 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, Ecosystem Diagnosis and Treatment study of the Cedar River, and Elliott Bridge Replacement FSEIS, as well as past and future work by King County Ecological staff.

Prior to minor management activities (e.g., small planting project) a discussion of the proposed activity should occur that is focused on evaluating whether or not the activity could do harm to intact 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 Cavanaugh Pond Natural Area, 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

Two key alterations of hydrologic processes on the Cedar River affect Cavanaugh Pond Natural Area and the river in this vicinity: channelization and revetment placement along the mainstem banks, and hydrologic alterations to tributary, surface and sub-surface flow due to the old railroad bed/SR 169.

Channelization and Revetment Placement

Bank hardening in the Lower Cedar River has restricted the movement of water in the river channel and limited the river's connection with its floodplain. The restoration of channel and riparian conditions is being explored through basin planning and flood hazard reduction activities. Several projects involving revetment removal, setback, and restoration have been proposed in this vicinity (see inset box in Part 7 "Recommendations"). Removal of the Riverbend revetment to the east of Cavanaugh Pond, and of revetments on the right bank (north side) of the river may be future projects that would affect hydrology at the site.

Cavanaugh Pond's entire north bank is a road and revetment running the length of the wetland. Revetment removal may help restore dynamic river processes through this area, but would affect the integrity of the wetland as a pond system. This wetland is an artifact of gravel mining, but currently represents a valuable open water wetland system and wildlife habitat. The tradeoffs of restoring processes through this site would need to be weighed against the possible disruption of this resource.

Hydrologic alterations to water flow due to railroad bed

The roadbed has cut off most of the flows from the southern valley wall to the Cedar River, restricting drainage to a few culverts under SR 169 and the Trail in the vicinity of Cavanaugh Pond Natural Area. This has affected the hydrology of the wetlands and riparian zone in the area. Development in the area may contribute to sedimentation problems in one of these tributaries (#0312). There is little possibility of restoring the hydrologic connections between the southern valley slopes and the Cedar River that were disrupted by road construction.

Restoring Structure and Function

Cavanaugh Pond Natural Area offers an opportunity for restoring riparian vegetation structure through native tree and shrub plantings as well as controlling invasive and non-native species. Plantings should represent the historic vegetative communities commonly associated with forested riparian areas in western Washington and at the site in particular. Inherent in the restoration should be efforts to maintain structural complexity, 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.

Restoration work has targeted the extensive invasive species presence surrounding Cavanaugh Pond; however invasives persist in the understory layer in many parts of the pond and the rest of the Natural Area. Large amounts of staff and volunteer time are dedicated to this work. The persistent character of these invasives and experience to date indicates that continued investments in time and funding will be required in the future to contain and, ideally, to reduce invasive species presence.

In the event that floodplain reconnection projects are ultimately implemented to restore ecological processes, restoration projects to restore structure and function may be lost in the short term if located in

an area where natural processes substantially change topography, hydrology, or other physical factors. Affected these reconnection projects. However, over the long term, structure and function would likely be restored under the influence of restored flooding and river meander processes.

Impacts of Elliott Bridge Replacement Project

The new Elliott Bridge roadway along the western side of parcel 9018 will establish a three-lane roadway and bridge with a pedestrian walkway (see Appendix 2 for project plan sheet). Construction will impact the western extent of the Natural Area, where clearing, grading, fill, and clearing of trees will occur. A stormwater detention pond will be built on the southwest corner of parcel 9018. The Cedar River Trail will be re-routed onto parcel 9018. The 1997 easement and 2004 drainage easement allow some of these uses to occur; other uses required for construction will need to be governed by special use permits (or other permits) issued by Parks property management under approval by the Natural Resource Lands program. Conditions of these latter permits usually include monitoring and maintenance of the site for a specified time period, as well as other conditions as negotiated.

The FSEIS provides extensive analysis of the impacts of this project. A few impacts relevant to management of Cavanaugh Pond Natural Area include:

- Unavoidable adverse impacts to “the mature riparian forest on the south bank of the river...contiguous with Cavanaugh Pond open space [which] is one of the largest expanses of remaining riparian forest on the lower Cedar River.” (King County 2003b, p. 83) Project work will clear approximately 2 acres of forest and create a new edge and access point to the remaining forest adjacent to the bridge.
- New access to parcel 9018 may introduce new types and levels of use. The FSEIS noted that “The area under the bridge will not be left cleared making it less desirable as an illegal camping site”; stumps, logs, and debris will be left under the bridge “in order to provide additional large woody debris recruitment and wildlife habitat.” (King County 2003b, p. 233)
- Construction plans from the biological assessment show the western portion of parcel 9018 used for temporary staging and stockpiling of construction materials (Figure 2 in Appendix H of King County 2003b).
- Impacts to fish and wildlife include unavoidable adverse impacts to chinook spawning grounds at the location of the new bridge, as well as many impacts to habitat that are addressed through the mitigation plan for the bridge. (King County 2003b) Permits and approvals issued by state, federal, and local agencies require monitoring of project work, and of pre- and post-construction conditions, which will be coordinated by the King County Department of Transportation.

In addition to restoration direction associated with bridge construction, approximately 300 trees will be planted on the northwest corner of parcel 9018 as mitigation for bridge impacts (location shown on Appendix 2 map).

Further research should determine whether the funds were provided from Roads to Parks for the conversion of Forward Thrust-funded land (as discussed in Appendix 3). If this transaction has not occurred, these funds should be transferred in order to comply with Forward Thrust bond restrictions on conversion.

Public Use

Current public use includes a moderate number of visitors engaging in passive recreational activities such as walking and nature observation. Informal trails leading to the river allow occasional use of the riverbank for water access by visitors. Most of the recreational use of the site should remain confined to the upland areas and away from more sensitive portions of the site. Monitoring changes in public visitation, types of use and impacts on the ecological systems will alert land use managers to needed

management adjustments. This type of monitoring will be of particular importance when the new bridge is installed at parcel 9018.

There is no parking for the site. However, there is no intention to create additional parking. The site is accessible by the local neighbors and trail users, and the mobile home park has allowed parking for visitors during educational events during the spawning season.

Littering and public dumping are a frequent problem, requiring ongoing attention to litter collection.

Annual establishment of the temporary broodstock collection weir needs to be in compliance with permit conditions as discussed in Part 4. In the future, further decision about ongoing use of the site for the weir may be made in association with permit renewal or other applicable inter-agency discussion about Cedar River salmon recovery activities.

There are no apparent revenue-generating opportunities at Cavanaugh Pond Natural Area.

Part 7. Management Goals, Objectives, and Recommendations

The objectives and recommendations in this section are derived from the standard practices for most NRL sites. NRL staff will revise the recommendations for Cavanaugh Pond 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 Cavanaugh Pond 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 the 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 the site

Decisions about site management and public access should consider the regional significance of the 14-acres Cavanaugh Pond wetland, and the important habitat functions of the wetland and the stands of riparian forest along the Cedar River. Public access should be focused on the eastern parcel, on the established levee road leading along the north side of Cavanaugh Pond, and the cleared weir area at the end of the levee road. This area provides excellent passive recreational and interpretive opportunities, although care should be taken to ensure that informal trails do not proliferate in areas that are erosive or will negatively impact the wetland or river. This overarching recommendation is carried out through the various recommendations below.

Objective: Develop long term ecologically based protection and restoration actions

Recommendation: Perform baseline inventories and assessments

Complete 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.

Recommendation: Develop recommendations for site restoration from inventory information

Use inventory and assessment information to develop specific actions that meet the purpose and goals of sites identified as King County Ecological Lands. These projects should be developed with the input of relevant King County staff, which may include NRL, basin steward, resource coordinator, capital projects, flood hazard reduction, and ecologists.

The Lower Cedar Basin Plan makes a number of management recommendations in the vicinity of the site that may be considered for future recommendations. These general proposals are aimed at the multiple interests of the basin plan (flood hazard reduction, habitat quality and salmonid health, and water quality and quantity) and may or may not be in accordance with ecological land management goals. These proposals are not prioritized or scheduled for implementation.

The WRIA 8 Chinook Salmon Conservation Plan (also called the Draft Plan Framework and Preliminary Actions List) (WRIA 8 Service Provider Team 2003) noted additional recommendations for this area (Chapter 6, p. 3-4). As with the Basin Plan recommendations, these proposals are not prioritized or scheduled for implementation.

Lower Cedar Basin Plan Recommendations (All item and page numbers below reference WMC 1998)

- Within Cavanaugh Pond, restoration projects to excavate and restore groundwater fed habitat are identified at Lower Summerfield Pond and Channel (RM 5.6, left bank) and Summerfield Pond and Channel (RM 6.0, left bank). (p. 4-89, MS 4: Mainstem Habitat Restoration and Enhancement Program)
- Cavanaugh Pond Revetment (RM 6.5, left bank) was identified for removal or relocation to improve habitat and increase floodplain volume. (p. 4-90, MS 5: Modify Levees and Revetments)
- On the opposite side of the river (right bank between RM 5.4-6.0) Capital Improvement Project 3111, Elliot Bridge/Lower Jones Road Flood Damage Reduction identified up to 20 flood-prone homes for buyout, with subsequent revetment removals and road realignment. (p.4-10)
- Just upstream of Cavanaugh Pond, Riverbend Mobile Home Park Revetment Modification (RM 7.2, left bank, p. 4-9, CIP 3110) would recontour the revetment to reduce erosion and flood damage, to enhance floodwater conveyance, and to enhance aquatic habitat through restoration and planting of expanded channel area. Riverbend Ponds Habitat Restoration and Enhancement recommendation (RM 7.2, left bank, p.4-89, MS 4) would excavate groundwater-fed habitat at the mobile home park.
- Mainstem Recommendation MS 11 Treatment of I 405 and SR 169 Stormwater (p. 4-99) recommends WSDOT implement stormwater retention/treatment, which impacts Cavanaugh Pond water quality.

WRIA 8 Draft Plan Framework and Preliminary Actions List (WRIA 8 Service Provider Team 2003):

- Herzmann Levee Floodplain Restoration: affecting the right bank across from Cavanaugh Pond
- Riverbend Mobile Home Park Buyout: Related to the bulleted item above, recommending buyout of mobile home park in association with levee modification and restoration.
- Explore partial removal of Riverbend Levee in order to reduce channel confinement and connect Cavanaugh Pond to the mainstem river.
- Bucks Curve buyout and restoration (RM 6.2-6.4): continue buyout and levee setback across from downstream portion of Cavanaugh Pond.

Objective: Contain spread of invasive vegetation and maintain new native plantings

Recommendation: Monitor and control invasive vegetation

Park staff should monitor, contain, and where possible reduce the spread of noxious and invasive plant species that are present at the sites. This work is recommended particularly in those areas where planting projects have occurred.

This work occurs using primarily manual control by Park staff and volunteer labor throughout the year. Current level of activity is 4-5 volunteer events a year, and additional staff time throughout the year.

Recommendation: Maintain existing and establish new planting projects

King County Park staff and volunteers should continue to maintain native plantings, primarily by controlling invasive species. Plantings should be observed for plant survival, and re-planted where die-

off has occurred. New plantings should be installed, maintained, and monitored where feasible to control invasive species.

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 trash and respond as necessary to maintain a clean and safe property. Monitoring should occur at least monthly. Park staff should consider installing litter/dumping policy signs on the property if litter activity increases.

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

Recommendation: Monitor public access

Park staff should note changes in types of recreational activities at the site, 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.

Current use is passive recreation such as walking and nature observation, primarily occurring on the eastern Parcel 9100 (Cavanaugh Pond). The other portions of Cavanaugh Pond Natural Area receive limited to no use. This current use pattern is appropriate to site resources; site usage should be observed to ensure that this use pattern persists. If informal trails proliferate in areas that are erosive or will negatively impact the wetland or river, Park staff should close down those trails.

When Elliott Bridge is constructed, monitor levels of use in this portion of the property in particular.

Objective: Coordinate with King County DOT when Elliott Bridge work affects Cavanaugh Pond Natural Area property.

Recommendation: Ensure that Elliott Bridge and road construction meets conditions of applicable easements and Parks/NRL-issued permits

NRL and Parks property management should remain in contact with King County DOT as work progresses. Conditions for special use (or other appropriate) permits for work on Cavanaugh Pond parcel 9018 should be met by project applicant.

Recommendation: Determine whether Forward Thrust conversion requirement has been met.

NRL should coordinate with CPOSA, Parks and Roads to determine whether \$53,600 was transferred to Parks to meet conversion requirement for 1997 purchase of 2.15 acres from parcel 9018. If this transaction has not occurred, funds should be transferred as soon as possible.

Objective: Evaluate if continued installation of the weir is consistent with site goals and guidance from the Ecological Lands Handbook

Recommendation: For the time remaining on the Park Alteration Permit ensure that the site is used and restored according to permit requirements following each broodstock collection season.

Parks staff should ensure that use of site by WDFW staff for weir installation, broodstock collection, and post-weir restoration meets permit requirements. If use or restoration does not meet permit conditions, Parks Staff should notify NRL and other appropriate staff to develop an appropriate course of action to ensure that permit conditions are met.

When the permit is up for renewal in 2008, or prior to that time, if the evaluation described in the objective determines an incompatibility between weir installation and operation and site goals, the permit conditions should be modified to achieve consistency between site uses and site goals.

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 plans 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	NRL staff	Park Resource Staff	Basin Steward	WRIA Proj. Coord.	CPOSA	WEAT	FHRS	Parks Property Mgmt	King County DOT
Priority One										
Monitor and control invasive vegetation	At least monthly		X							
Maintain existing and establish new plantings	Maintenance seasonally		X							
Control litter/dumping and encroachment activities	At least monthly		X							
Monitor public access	At least monthly		X							
Ensure appropriate use by weir staff	Seasonally		X							
Ensure that Elliott Bridge and road construction meet conditions of applicable easements and Parks/NRL-issued permits	As project work requires	X	X	X					X	X
Determine whether Forward Thrust conversion requirement has been met	2004	X				X			X	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	X	X	X	
Evaluate weir permit re-issue	2008	X	X	X	X				X	
Update Site Management Guidelines	Within at least five years	X	X	X						

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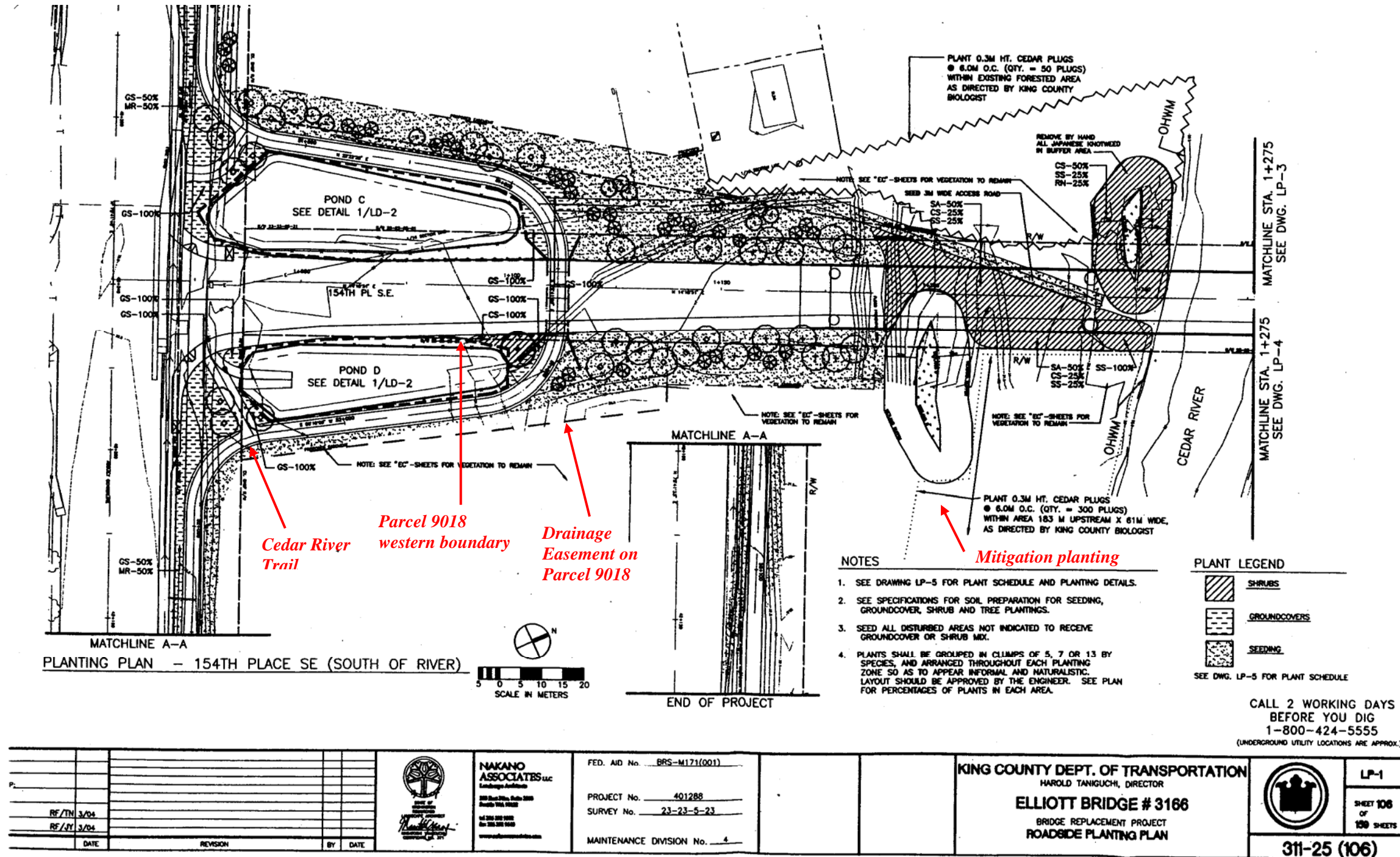
Appendix 1: Parcel Numbers of King County FHRS and Roads- Owned Lands in Cavanaugh Pond Vicinity

Parcel Number	Owner	Address if available
222305-9104	FHRS (with Roads cost-share)	15031 SE Jones Rd.
222305-9105	FHRS (with Roads cost-share)	15017 149 th Ave SE
222305-9134	FHRS (with Roads cost-share)	15017 149 th Ave SE
232305-9097	FHRS (with Roads cost-share)	15031 SE Jones Rd.
232305-9088	FHRS (with Roads cost-share)	15017 149 th Ave SE
232305-9133	King County owns portion (Deed 20031219001122)	15000 block 149 th Ave SE
232305-9015	Roads	15400 SE Jones Rd.
232305-9052	Roads	15401 SE Jones Rd.
232305-9061	Roads	15405 SE Jones Rd.
232305-9066	Roads	15225 SE Jones Rd.
232305-9071	Roads	15407 SE Jones Rd.
232305-9079	FHRS	15817 SE Jones Rd.
232305-9083	FHRS	15809 SE Jones Rd.
232305-9089	Roads	15226 SE Jones Rd.
232305-9091	FHRS	15809 SE Jones Rd.
232305-9126	FHRS	15655 SE Jones Rd.
232305-9152	FHRS	15809 SE Jones Rd.
Unnumbered parcel (formerly the western portion of 232305-9018)	Roads	15200 block of SR 169
242305-9054	FHRS	17653 SE Jones Rd.
242305-9062	FHRS	17655 SE Jones Rd.
242305-9116	Roads	17600 block SE Jones Rd

Appendix 2: Elliott Bridge Replacement Plan Sheet

Plans provided by Larry Jaramillo, Roads Department, on 3/30/04. The map is oriented with west at the top of the map. Cavanaugh Pond Parcel 9018 lies within and along the eastern edge of the project area.

Labels denoting “Cedar River Trail,” “Drainage Easement,” “Parcel 9018 western boundary,” and “Mitigation planting” added to plan sheet.



Appendix 3: Conversion of western portion of Parcel 9018

The western 2.15 acres of parcel 9018 were sold to the King County Department of Transportation in 1997 (Recording Number 199711191438). The Elliott Bridge Replacement Final Supplemental Environmental Impact Statement (FSEIS) reports that:

“To mitigate for impacts to parkland and recreational uses resulting from this acquisition, King County Department of Transportation contributed [\$53,600, the value of the acquired property]... to be dedicated to the purchase of new parkland near the Cedar Mountain Bridge and Ramp project. The money was transferred to the Cedar River Legacy program, specifically for the purchase of the Cedar Mountain Park parcel under the Legacy program. King County Resolution No. 34571 (“Forward Thrust”) passed in 1986 [sic. 1968] and provided for the acquisition and development of public park and recreation facilities. Section 7 of that resolution provided for the subsequent conversion of land originally acquired with the Forward Thrust funds to a different use if other equivalent land within the County were received in exchange. Therefore, the contribution of \$53,600 for the purchase of new park land near the Cedar Mountain Bridge was completely in accordance with Section 7 of the resolution. The King County Department of Transportation and King County Parks Department undertook this acquisition fully understanding and intending to fulfill their trust responsibility to the citizens of King County to achieve an appropriate balance of public benefit, public safety, and environmental protection.” (King County 2003b p. 157)

The Capital Projects and Open Space Acquisitions section of King County DNRP indicated that this information regarding the transfer of funds to the Cedar River Legacy program is incorrect to the best of its knowledge. CPOSA staff indicated that the recipient of the funds would likely have been the Parks Department not Cedar River Legacy (Holecek pers. comm. 2004).

Although Roads signed an agreement with the Parks Department to provide \$53,600 to the Parks Department to purchase land, at the time of writing Parks staff consulted have no record or knowledge that the funds were transferred (Eksten pers. comm. 2004a).

According to the Parks Trails Coordinator, Roads may have purchased land at the Cedar Mountain Bridge with the intention to buy multiple parcels at the site and to transfer the land to Parks to meet the conversion requirements. However, this single parcel owned by Roads at the Cedar Mountain Bridge does not support public recreation opportunity and would not meet conversion requirements (Eksten pers. comm. 2004b). The conversion requirement of Forward Thrust bond lands therefore may still need to be met.