

Cedar Sammamish Basin Technical Committee Meeting

Wednesday April 25, 1:30–3:30
Mercerview Community Center
Mercer Island, WA

A G E N D A

Purpose:

Review and discuss FCZD CIP prioritization criteria, basin specific issues, project list, and project summary template

- | | |
|---|------------------------------------|
| 1. Introductions | Nancy
Faegenburg
1:30 – 1:40 |
| 2. Update – King County Flood Control Zone District (KCFCZD) formation | Joanna Richey
1:45 – 1:55 |
| 3. Basin Technical Committee Work Program, Timeline and general ground rules for April - June 2007 | Steve Bleifuhs
1:55 – 2:05 |
| 4. Criteria for KCFCZD Project Selection and Sequencing | Steve Bleifuhs
2:05 – 2:20 |
| 5. Draft KCFCZD Cedar Sammamish Basin project list <ul style="list-style-type: none">• Overview of flood hazard issues in basin• Discussion of identified project list for Basin• Questions and answers | Nancy
Faegenburg
2:20 – 3:10 |
| 6. Project summary sheets <ul style="list-style-type: none">• Due May 16, 2007 | Steve Bleifuhs
3:15 – 3:25 |
| 7. Next Steps and Wrap Up | Steve Bleifuhs
3:25 – 3:30 |

CEDAR SAMMAMISH BASIN TECHNICAL COMMITTEE

MEETING SUMMARY WEDNESDAY APRIL 25, 2007 MERCERVIEW COMMUNITY CENTER

ATTENDEE	ORGANIZATION	PHONE NUMBER	EMAIL ADDRESS
Damon Diessner	City of Bellevue	425-457-0618	damondd@comcast.net
Kerry Ritland	City of Issaquah	(425) 837-3410	kerry@ci.issaquah.wa.us
Jenny Gaus	City Of Kirkland	(425) 587-3850	jgaus@ci.kirkland.wa.us
Tom Barry	City of Redmond	(425) 556-2870	tbarry@redmond.gov
Ron Straka	City of Renton	(425) 430-7248	rstraka@ci.renton.wa.us
Julie Hall	City of Seattle	(206) 233-7164	julie.hall@seattle.gov
Yoshihiro Monzaki	City of Woodinville	(425) 877-2294	yoshm@woodinville.wa.us
Tom Carpenter	Four Creeks UAC	(425) 271-2035	tdcarp@comcast.net
Geoff Clayton	UBC UAC	(425) 486-3206	wa.waterman@gmail.com
Joanna Richey	King County	(206) 296-8056	joanna.richey@metrokc.gov
Sandy Kilroy	King County	(206) 296-8047	sandra.kilroy@metrokc.gov
Kathy Wright	King County	(206) 684-1939	kathy.wright@metrokc.gov
Steve Bleifuhs	King County	(206) 296-8011	steve.bleifuhs@metrokc.gov
Nancy Faegenburg	King County	(206) 296-8372	Nancy.faegenburg@metrokc.gov
John Koon	King County	(206) 890-2562	john.koon@metrokc.gov

1. Call to Order and Introductions

Nancy Faegenburg, King County River and Floodplain Management Program Basin Technical Lead for the Cedar and Sammamish River Basins called the meeting to order shortly after 1:30 and introductions were made.

2. King County Flood Control Zone District Formation Update

Joanna Richey, Assistant Manager of the Water and Land Resources Division of the King County Department of Natural Resources and Parks described Ordinance 15728 which was adopted by the King County Council on April 16, 2007. The ordinance had had full bipartisan support of the Council. Key points included:

- Creation of the King County Flood Control Zone District (KFCZD).
- Transfer of the assets of the previously-existing ten individual flood control zone districts in King County to the new countywide district.
- Establishment of a fifteen-member Advisory Committee made up of:
 - Elected official from the cities of Carnation, Snoqualmie, North Bend, Bellevue, Seattle, Renton, Tukwila, Kent and Auburn (permanent seats);
 - The King County Executive (permanent seat);
 - Four rotating seats to be recommended by the Suburban Cities Association (2-year rotating seats);

- One seat to be recommended by the county's six Unincorporated Areas Councils. Since some of the UACs are rural and others are urban, this position will rotate between rural and urban areas (2-year rotating seats).

The ordinance did not establish a levy rate to fund the new countywide flood control zone district. This should happen in conjunction with the budget process during the fall of 2007.

An earlier ordinance (15673, passed January 16, 2007) which adopted the 2006 King County Flood Hazard Management Plan, identified the need to have the countywide flood control zone district address subregional flood risk and infrastructure needs on tributaries and in local jurisdictions.

A first step being taken by King County toward the implementation of the KCFCZD is the creation of Basin Technical Committees (BTCs) for each of the major river basins in King County. These Basin Technical Committees have been formed for the South Fork Skykomish, Snoqualmie, Cedar/Sammamish, Green/Duwamish, and White River basins.

Links to ordinances 15673 and 15728 can be found at:

<http://www.metrokc.gov/mkcc/floodplan/index.htm>

3. Basin Technical Committee Work Program, Timeline and General Ground Rules for April – June 2007

Steve Bleifuhs, King County River and Floodplain Management Program Manager, handed out a work plan and timeline (yellow document) describing the role of the BTC for the current and upcoming meetings.

The role of the Basin Technical Committees over the next few months will be to concur on a CIP list for the basin so that the Advisory Committee can make a complete funding recommendation to the King County Council, which by state law is the Board of Supervisors for the District. By ordinance, the Advisory Committee must transmit its funding recommendation to Board of Supervisors by August 31st of each year so that it can be folded into King County's annual budget process. The Advisory Committee will hold its first meeting on May 17, 2007 but will not need the CIP information from the BTCs until mid June of 2007. The work of the five BTCs will be compiled into a single district CIP work program by district (county) staff prior to the June Advisory Committee meeting.

The committee discussed the likelihood that the BTC would eventually need formal operating rules, but agreed (by consensus with no minority opinions expressed) that with the tight time line over the next few months, the group would operate primarily on a consensus basis for the time being.

The Committee went on to discuss the role of the BTC with respect to the project list and prioritization criteria. Issue discussed included:

- King County has provided an initial project list and sequencing (buff colored handout) based on the policies in the 2006 King County Flood Hazard Management plan and the criteria presented in the associated criteria sheet. (*The group appeared to agree that it would be easier to react to an initial prioritized list than it would be to create something from scratch.*)

- The project summary sheets are planning level documents and may not have enough information to inform detailed prioritization. The project summaries do not quantify the described benefits. Additional analysis will be needed as projects move forward.
- The process needs to be more than a ‘brain dump’; the criteria, and prioritization role of the BTC, needs to be taken seriously. The BTC members need to gain an understanding of all of the projects.
- While the pressing, short term task that the BTC needs to address is agreement on the CIP list for the basin, the BTC’s job does not necessarily end after the district CIP list is forwarded to the Advisory Committee. The BTC is expected to continue to review and help develop annual CIP funding recommendations as well as share and discuss operating and programmatic issues.
- Additional aspects of the long-term role and operational protocols of the BTCs still need to be developed and agreed upon.
- While the BTC will provide input regarding project prioritization and sequencing, it will ultimately be incumbent upon the Advisory Committee to make the recommendation to the Board of Supervisors.
- District staff will be tasked with combining recommendations from the five BTCs for transmittal to the Advisory Committee.

The group also discussed the levy rate noting that once it is set, it can more easily be lowered than raised, and that increases are limited to no more than one percent per year.

4. Criteria for KCFCZD Project Selection and Criteria

Steve Bleifuhs, handed out a document (blue) describing the criteria and policies used to screen and initially prioritize projects described in the 2006 King County Flood Hazard Management Plan. The committee discussed project prioritization at length. Specific issues included:

- The distinction between project prioritization as a function of need or importance, and project sequencing, which must take into account project opportunity and readiness.
- While the criteria presented have thus far been used only for regional projects, they could provide a starting point for establishing criteria for subregional project selection and prioritization.
- Different cities have made different levels of investment in their stormwater and river projects. This fact raises the question as to whether and how subregional funds should be allocated. The degree to which the ability to match countywide flood control zone district funds with local funds was discussed and some suggested that the degree to which a project could leverage non flood control zone district funds should be included in the selection criteria for subregional projects.
- The ordinance language that mandates the creation of a subregional fund provides little guidance as to what kinds of projects would be eligible for funding through the subregional fund. The committee discussed several aspects of the potential definitions of regional versus subregional including the size of the water body, and the nature of the economic impact of a problem.

- County staff acknowledged that while most people understand the general concept of a subregional fund, the size, detail and qualifications that must be met to use the fund have not been defined. It is anticipated that the BTCs will provide input to the Advisory Committee to support the development of workable criteria for evaluating subregional projects.
- The question as to how the criteria were applied was raised. Several members indicated that it needed to be as transparent and as objective as possible.
- Some specific criteria that were discussed included:
 - The need to ensure that project benefits outweigh the costs.
 - The potential for legal responsibility to trump other criteria.
 - Consideration of repetitive loss properties.
 - Community Rating System credit.
- In response to inquiries concerning the degree to which the prioritization criteria and project list might be flexible, county staff provided the following contextual information for the discussion:
 - We need to get the BTC members grounded in the reality of the problems and the projects. This project list reflects our present understanding of regional flooding issues, but we expect the BTC will help inform and update this list.
 - We need to see if there are any regional project needs that were missed during the development of the flood plan.
 - We need to be aware that conditions will change both in terms of flood damages and land use and development.
 - We will need to adjust the project list every year to address new or changing needs.
 - The criteria presented today are what King County has been using, but we (King County) want to hear the BTC's ideas and concerns. We are not stuck with the current criteria, but we would like to make sure they are understood.
 - For the moment, the subregional criteria are a "blank sheet".
 - Projects forwarded as subregional projects that are found to meet regional project criteria may be moved on to the regional project list.
 - Subregional and regional projects are not expected to be competing against each other.

The committee agreed to table the discussion of regional versus subregional definitions and criteria so that Nancy Faegenburg could provide an overview of the problems and project proposals in the basin.

During the above discussion, there was additional discussion on the topic of existing funding. Key points during this discussion included:

- The River Improvement Fund, which is about \$0.01/\$1000 of assessed value, is expected to continue, and to supplement, funds raised for the countywide flood control zone district.

5. Draft KCFCZD Project List

Nancy Faegenburg provided a brief overview of the flooding problems and proposed project on the Cedar and Sammamish Rivers and on Issaquah Creek (See project summary sheets).

A brief summary of highlights:

- On the Cedar she described flooding affecting Renton's downtown and business district, as well as fairly widespread flooding in predominantly residential areas extending from Renton through Maple Valley. Many properties are identified by FEMA as repetitive loss properties. Projects include maintenance dredging at the mouth, bank stabilization, levee setbacks, home acquisitions, and feasibility studies.
- The entire Sammamish River is a flood control facility built under a joint project agreement between the US Army Corp of Engineers and King County. Adjacent land uses include extensive agriculture and recreation in the middle to upper river, with residential uses toward the downstream end. Projects focus on maintenance and retrofits to the 60's era facility.
- Issaquah Creek flood hazard management, especially in recent years, has largely fallen under the City of Issaquah's purview. Several FEMA-identified repetitive loss properties are recommended for acquisition.

Issues discussed during this presentation included:

- The need to do some benefit cost analyses of projects as we move forward with the program.
- B-C analyses should include avoided cost for facility maintenance. However, there are some challenges. Historic maintenance costs are available for recent years, but only for some pre-1990 work. Additionally, the work itself has shifted over time, covering everything from traditional rock riprap to, more recently, bioengineered facility repairs and retrofits.
- Consideration of "residual risk", two definitions of which were offered:
 1. The potential for damages that occur when flood waters get behind a levee and cannot get back into the river.
 2. The risk to areas which, although protected by levees, are still at risk from flood damages should the levee fail.
- Funds already spent by local jurisdictions on river projects, and potential projects already identified by some of the cities.

The committee did not have time to discuss specific project details or the actual project list with respect to prioritization and sequencing.

6. Project Summary Sheets for New Projects

Nancy Faegenburg invited committee members to begin completing project summary sheets for projects that their respective jurisdictions would like to see added to the project list. A short discussion ensued during which the following issues and ideas were raised:

- In general, committee members felt they needed more guidance, especially with respect to the distinction between regional and subregional projects.
- County staff urged committee members to use their best judgment and focus, for now on the projects that might be considered regional. If some projects do not end up on the regional list, the descriptions will still be helpful as we move forward with the subregional criteria and project list.
- The value of numeric versus the qualitative application of prioritization criteria was discussed. The use of a numeric system, followed by a qualitative final check was also discussed.
- At this point, the committee needs to focus on the scale and the scope of the need more than the absolute sequencing of projects, although the latter will also be important as the annual 6-year CIP prepared.

The meeting was adjourned shortly after 3:30

Meeting summary prepared by John Koon.

Cedar Sammamish Basin Technical Committee

Work Plan and Timeline

April – June 2007

Purpose:

Provide input and concur with the King County Flood Control Zone District CIP project list for the Basin.

Meeting Date	Purpose	Post Meeting Tasks/Outcomes
April 25, 2007	Review and discuss FCZD CIP prioritization criteria, basin specific issues, project list, and project summary template	Submit e-copies of project summary sheets Due May 16, 2007
May 23, 2007	Review and screen newly submitted project summary sheets, Concur with sequenced CIP list	Prepare documents for June 13, 2007 BTC meeting
Tentatively June 13, 2007	Final concurrence on Cedar Sammamish Basin CIP List	Present FCZD CIP list at June 22, 2007 Advisory Committee Meeting

King County Flood Control Zone District Criteria and Policies to Guide Project Selection and Sequencing

All projects contained within the Draft KC FCZD CIP list were identified within the adopted 2006 King County Flood Hazard Management Plan. King County uses severity, consequence, urgency, opportunity and readiness as general categories of criteria for selecting, prioritizing and sequencing projects actions to address flood and channel migration risks.

CRITERIA

Flood Risks – Severity (Policy G-2)

The natural processes of flooding and channel migration become risks when human development is located within flood hazard areas. The level of risk is evaluated on a case by case basis using the predicted likelihood of flooding and channel migration and the consequences that would result if no action is taken. Flood risks, and the resulting consequences that would result if no action is taken, are generally prioritized in the following order:

- a. Threats to public safety.
- b. Damage to public infrastructure.
- c. Impacts on the regional economy.
- d. Damage to private structures.

Consequence, Urgency, Opportunity (Policy PROJ-1: Prioritizing Flood Hazard Risk)

Listed in order of importance:

- a. The consequences that will result if no action is taken. Consequences should be prioritized as identified in Policy G-2.
- b. Urgency, where urgency is a measure of how quickly an action needs to be taken in order to prevent a risk from growing worse.
- c. Legal responsibility and authority, where legal responsibility and authority is a contractual relationship between King County and another person or agency to maintain a flood protection facility.
- d. Funding or partnership opportunities.

Readiness

All flood CIP recommendations contained within the adopted 2006 King County Flood Hazard Management Plan were additionally screened according to the following criteria pertinent to readiness and potential scheduling.

- a. Is the project identified within an adopted local hazard mitigation plan?
- b. Do property interests need to be acquired (fee simple or easement) for this project?
- c. If property interests need to be acquired, is the landowner willing to sell or sign a voluntary letter of agreement, expressing an interest in selling necessary property interests?
- d. What is the anticipated project start date (reflecting feasibility, opportunity, and readiness of project proposal)?

Note: The above criteria have been used for identified flood capital projects. These criteria will be used for any newly identified projects. This criteria may also be used as starting point to select project criteria for proposed District Sub-regional Opportunity Fund.

**Cedar Sammamish Basin
King County Flood Control Zone District - Draft CIP List
April 20, 2007**

In Progress? Y/N	Time Sensitive Project? Y/N	Geographic overlap w/salmon plan project? Y/N	Project Name	Flood Problem	What's at Risk	Project Description	Total Cost
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Repetitive Loss	Residential	Purchase or otherwise mitigate flood risks to repetitive loss property - (Bote - 6399600140 - Orchard Grove). Supports recommendations ERA-1 and ERA-4.	\$ 328,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Repetitive Loss	Residential	Purchase or otherwise mitigate flood risks to repetitive loss property - (Bradley - 6399600145 - Orcharde Grove). Supports recommendations ERA-1 and ERA-4.	\$ 235,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Repetitive Loss	Residential	Purchase or otherwise mitigate flood risks to repetitive loss property - (Parsons - 6399600105 - Orchard Grove). Supports recommendations ERA-1 and ERA-4.	\$ 398,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Repetitive Loss	Residential	Purchase or otherwise mitigate flood risks to repetitive loss property - (Carleton - 5108400040 - Bain Rd). Supports recommendations ERA-1 and ERA-4.	\$ 299,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Repetitive Loss	Residential	Purchase or otherwise mitigate flood risks to repetitive loss property - (Paulsen - 5108400041 - Bain Rd). Supports recommendations ERA-1 and ERA-4.	\$ 217,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Repetitive Loss	Residential	Purchase or otherwise mitigate flood risks to repetitive loss property - (Hanson - 2322069086 - U/S Arcadia). Supports recommendations ERA-1 and ERA-4.	\$ 297,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Repetitive Loss	Residential	Purchase or otherwise mitigate flood risks to repetitive loss property - (Law - 3223069089 - Lions Club). Supports recommendations ERA-1 and ERA-4.	\$ 326,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Repetitive Loss	Residential	Purchase or otherwise mitigate flood risks to repetitive loss property - (Willaford - 3223069017 - Lions Club). Supports recommendations ERA-1 and ERA-4.	\$ 339,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Repetitive Loss	Residential	Purchase or otherwise mitigate flood risks to repetitive loss property - (Rosenbaum - 2323059098 - Elliott Bridge). Supports recommendations ERA-1 and ERA-4.	\$ 372,000

**Cedar Sammamish Basin
King County Flood Control Zone District - Draft CIP List
April 20, 2007**

In Progress? Y/N	Time Sensitive Project? Y/N	Geographic overlap w/salmon plan project? Y/N	Project Name	Flood Problem	What's at Risk	Project Description	Total Cost
N	N	N	Issaquah Creek: Early Residential Flood Hazard Mitigation	Repetitive Loss	Residential	Elevate or otherwise mitigate flood risks to repetitive loss property - (Smith-2223069015). Supports recommendations ERA-1 and ERA-4.	\$ 66,000
N	N	N	Issaquah Creek: Early Residential Flood Hazard Mitigation	Repetitive Loss	Residential	Elevate or otherwise mitigate flood risks to repetitive loss property - (Wade - 2616800580). Supports recommendations ERA-1 and ERA-4.	\$ 66,000
Y	Y	Y	Cedar Rapids Levee Setback	Channel constriction; facility vulnerability	Downstream residential	Set back levee to improve flood conveyance and capacity. Complete project design, permits, and construction. Funding will cover the grant match and project management costs.	\$ 137,000
Y	N	N	Cedar Grove Mobile Home Park Acquisition	Fast and deep flows; levee vulnerability	Residential flooding	Purchase homes and property in this neighborhood of homes which is subject to extreme flooding. Project is grant funded. Funding will cover grant match and project management costs.	\$ 4,349,000
N	N	Y	Issaquah: Streambank Stabilization	Bank erosion	252nd Street	Explore soft bank stabilization options at 3 sites along Issaquah Creek where roads and other infrastructure are at risk from erosion; 252nd St. extends ~500 LF	\$ 519,000
Y	Y	Y	Willowmoor Floodplain Restoration	Channel and facility maintenance standards	River and lake levels; protected habitat areas	Improve conveyance at the outlet of Lake Sammamish for flood risk reduction purposes.	\$ 2,944,000
N	N	Y	Littlefield-Cummins to Belmondo (Cedar Littlefield-Cummins Belmondo)	Channel migration hazards; levee overtopping; facility vulnerability	Residential	Acquire homes located in the floodplain or what appears to be the severe channel migration hazard area (based on preliminary findings of CMZ mapping in progress).	\$ 5,181,000
N	N	Y	Herzman Levee Setback & Floodplain Reconnection	Channel constriction; facility vulnerability	Cedar River Trail and SR-169	Setback levee to reduce erosive forces on the Cedar River Trail and SR-169.	\$ 1,023,000

**Cedar Sammamish Basin
King County Flood Control Zone District - Draft CIP List
April 20, 2007**

In Progress? Y/N	Time Sensitive Project? Y/N	Geographic overlap w/salmon plan project? Y/N	Project Name	Flood Problem	What's at Risk	Project Description	Total Cost
N	N	Y	Jan Road-Rutledge Johnson Levee Setbacks	Channel constriction; facility vulnerability	Cedar River Trail and SR-169	Remove portions of both levees that solely protect open space land. Segments of existing levees constrict conveyance and direct erosive flood flows into the Cedar River Trail and SR-169.	\$ 955,000
N	N	Y	Rainbow Bend Levee Setback and Floodplain Reconnection	Channel constriction; facility vulnerability	Cedar River Trail and SR-169	Setback levee to achieve improved conveyance and floodplain capacity.	\$ 1,733,000
Y	N	Y	Elliott Bridge Levee Setback and Acquisition (Cedar Elliott Bridge)	Overtopping levee; seepage; repetitive loss properties	Residential	Complete hazard mitigation projects (buyouts, levee setback, etc) for a repetitive loss area reach currently constrained by armored banks that do not offer adequate flood risk reduction	\$ 1,821,000
N	N	Y	WPA Levee Setback and Acquisition (Cedar WPA)	Overtopping levee; channel migration hazards; facility vulnerability	Residential	Acquire homes in floodway and floodplain. Setback or remove revetment. Restore and revegetate floodplain.	\$ 1,821,000
N	N	Y	Lower Lions Club to Cedar Grove Road (Cedar Lower Lions)	Overtopping levee; repetitive loss properties	Residential	Acquire flood-prone homes, including two repetitive loss properties. Adjacent to completed flood buyout and private land managed for educational and conservation purposes.	\$ 1,050,000
N	N	N	Cedar River Gravel Removal	Sedimentation accumulation; levee overtopping	Business / commercial development	Support periodic gravel removal from the lower Cedar River to maintain 100 year flood protection.	\$ 4,827,000
N	N	N	Rhode Levee Setback and Home Buyouts	Overtopping levee; channel constriction; facility vulnerability	Residential	Purchase homes along path of fastest, deepest flood flow, and set back the levee.	\$ 3,518,000
N	N	Y	Brassfield Revetment Setback and Acquisition (Cedar Brassfield)	Channel constriction; facility vulnerability	Residential	Complete hazard mitigation projects (buyouts, levee setback, etc) in a reach currently constrained by levees on both banks.	\$ 1,821,000

**Cedar Sammamish Basin
King County Flood Control Zone District - Draft CIP List
April 20, 2007**

In Progress? Y/N	Time Sensitive Project? Y/N	Geographic overlap w/salmon plan project? Y/N	Project Name	Flood Problem	What's at Risk	Project Description	Total Cost
N	N	Y	Orchard Grove (Cedar Orchard Grove)	Channel constriction; facility vulnerability	Residential	Pursue flood buyouts in the Orchard Grove and restore floodplain where possible. Buyouts should include the 'BN Nose' property upstream of revetment.	\$ 3,837,000
N	N	Y	Getchman Levee Setback and Floodplain Reconnection	Channel constriction; facility vulnerability	Maxwell Road; residential	Setback the levee to improve conveyance and capacity. Most of the acquisitions needed for this project have already been completed.	\$ 2,670,000
N	N	Y	Lower Jones Road Setback	Facility damages; bank erosion, scour and undermining of structures	Jones Road; Cedar River Trail; residential	Purchase the homes and property and set back road and associated revetment to improve conveyance and capacity.	\$ 4,408,000
N	N	Y	Sammamish Bank Stabilization and Restoration	Channel and facility maintenance standards	River and lake levels; protected habitat areas	Setback banks and improve structural integrity through installation of riparian vegetation and additional instream features.	\$ 3,299,000
N	N	Y	Maplewood Acquisition and Levee Setback (Cedar Maplewood)	Overtopping levee; landslide hazard	Residential	Explore possible flood buyouts in this neighborhood and opportunities to restore floodplain. Explore options for bioengineering and softening bank hardening.	\$ 9,016,000
N	N	Y	Upper Jones Road Acquisition and Revetment Setback (Scott-Indian / Jones Reach)	Channel migration hazards; facility vulnerability	Residential	Floodplain buyouts of homes behind the upstream end of the Scott-Indian levee. The homes are not known to experience regular flooding, but are susceptible to undermining by channel migration or erosion. Setback facility.	\$ 3,837,000
N	N	Y	Riverbend Mobile Home Park Acquisition and Levee Setback (Cedar Riverbend Trailer Park)	Channel migration hazards; overbank flooding; facility vulnerability	Residential	Purchase property underlying 19 mobile homes nearest river, recontour existing revetment to reduce erosion, flood damage and improve flood conveyance and habitat. Alternatively, purchase all property and remove all mobile homes and the revetment and the d	\$ 6,525,000

**Cedar Sammamish Basin
King County Flood Control Zone District - Draft CIP List
April 20, 2007**

In Progress? Y/N	Time Sensitive Project? Y/N	Geographic overlap w/salmon plan project? Y/N	Project Name	Flood Problem	What's at Risk	Project Description	Total Cost
N	N	Y	Dorre Don Meanders Project (Cedar Dorre Don /Dorre Don Meanders)	Channel migration hazards; overbank flooding; facility vulnerability	Residential	Acquire flood-prone properties in lower Dorre Don area and modify levees and restore floodplain where feasible to reconnect areas of the floodplain with the river for conveyance.	\$ 14,589,000
			15 Built Capital Projects + 18 Acquisition Projects				\$ 82,823,000

**Cedar Sammamish Basin
King County Flood Control Zone District - Draft CIP List
April 20, 2007**

In Progress? Y/N	Time Sensitive Project? Y/N	Geographic overlap w/salmon plan project? Y/N	Project Name	Project Description	Total Cost
N	N	Y	Cedar Brassfield	Complete hazard mitigation projects (buyouts, levee setback, etc) in a reach currently constrained by levees on both banks.	\$ 1,821,000
N	N	Y	Cedar Dorre Don /Dorre Don Meanders	Acquire flood-prone properties in lower Dorre Don area and modify levees and restore floodplain where feasible to reconnect areas of the floodplain with the river for conveyance.	\$ 14,589,000
Y	N	Y	Cedar Elliott Bridge	Complete hazard mitigation projects (buyouts, levee setback, etc) for a repetitive loss area reach currently constrained by armored banks that do not offer adequate flood risk reduction	\$ 1,821,000
Y	N	N	Cedar Grove Mobile Home Park Acquisition	Purchase homes and property in this neighborhood of homes which is subject to extreme flooding. Project is grant funded. Funding will cover grant match and project management costs.	\$ 4,349,000
N	N	Y	Cedar Littlefield-Cummings Belmondo	Acquire 10 parcels spanning 71 acres. Several homes are located in the floodplain or what appears to be the severe channel migration hazard area (based on preliminary findings of CMZ mapping in progress).	\$ 5,181,000
N	N	Y	Cedar Lower Lions	Acquire 39 acres, 12 parcels, including a repetitive loss property. Adjacent to completed flood buyout and an approximate 15-acre private land holding managed for educational and conservation purposes.	\$ 1,050,000
N	N	Y	Cedar Maplewood	Explore possible flood buyouts in this neighborhood and opportunities to restore floodplain. Explore options for bioengineering and softening bank hardening.	\$ 9,016,000
N	N	Y	Cedar Orchard Grove	Pursue flood buyouts in the Orchard Grove and restore floodplain where possible. Buyouts should include the 'BN Nose' property upstream of revetment.	\$ 3,837,000
Y		Y	Cedar Rapids Levee Setback	Set back levee to improve flood conveyance and capacity. Complete project design, permits, and construction. Funding will cover the grant match and project management costs.	\$ 137,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Purchase or otherwise mitigate flood risks to repetitive loss property - (Bote - 6399600140). Supports recommendations ERA-1 and ERA-4.	\$ 328,000

**Cedar Sammamish Basin
King County Flood Control Zone District - Draft CIP List
April 20, 2007**

In Progress? Y/N	Time Sensitive Project? Y/N	Geographic overlap w/salmon plan project? Y/N	Project Name	Project Description	Total Cost
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Purchase or otherwise mitigate flood risks to repetitive loss property - (Bradley - 6399600145). Supports recommendations ERA-1 and ERA-4.	\$ 235,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Purchase or otherwise mitigate flood risks to repetitive loss property - (Carleton - 5108400040). Supports recommendations ERA-1 and ERA-4.	\$ 299,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Purchase or otherwise mitigate flood risks to repetitive loss property - (Hanson - 2322069086). Supports recommendations ERA-1 and ERA-4.	\$ 297,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Purchase or otherwise mitigate flood risks to repetitive loss property - (Law - 3223069089). Supports recommendations ERA-1 and ERA-4.	\$ 326,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Purchase or otherwise mitigate flood risks to repetitive loss property - (Parsons - 6399600105). Supports recommendations ERA-1 and ERA-4.	\$ 398,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Purchase or otherwise mitigate flood risks to repetitive loss property - (Paulsen - 5108400041). Supports recommendations ERA-1 and ERA-4.	\$ 217,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Purchase or otherwise mitigate flood risks to repetitive loss property - (Rosenbaum - 2323059098). Supports recommendations ERA-1 and ERA-4.	\$ 372,000
N	N	N	Cedar River Early Action Residential Flood Hazard Mitigation	Purchase or otherwise mitigate flood risks to repetitive loss property - (Willaforde - 3223069017). Supports recommendations ERA-1 and ERA-4.	\$ 339,000
N	N	N	Cedar River Gravel Removal Project	Support periodic gravel removal from the lower Cedar River to maintain 100 year flood protection.	\$ 4,827,000
N	N	Y	Cedar Riverbend Trailer Park	Purchase property underlying 19 mobile homes nearest river, recontour existing revetment to reduce erosion, flood damage and improve flood conveyance and habitat. Alternatively, purchase all property and remove all mobile homes and the revetment and the d	\$ 6,525,000
N	N	Y	Upper Jones Road Revetment Project	Floodplain buyouts of homes behind the upstream end of the Scott-Indian levee. The homes are not known to experience regular flooding, but are susceptible to undermining by channel migration or erosion. Setback facility.	\$ 3,837,000
N	N	Y	Cedar WPA	Acquire homes in floodway and floodplain. Setback or remove revetment. Restore and revegetate floodplain.	\$ 1,821,000

**Cedar Sammamish Basin
King County Flood Control Zone District - Draft CIP List
April 20, 2007**

In Progress? Y/N	Time Sensitive Project? Y/N	Geographic overlap w/salmon plan project? Y/N	Project Name	Project Description	Total Cost
N	N	Y	Getchman Levee Setback and Floodplain Reconnection	Setback the levee to improve conveyance and capacity. Most of the acquisitions needed for this project have already been completed.	\$ 2,670,000
N	N	Y	Herzman Levee Setback & Floodplain Reconnection	Setback levee to reduce erosive forces on the Cedar River Trail and SR-169.	\$ 1,023,000
N	N	N	Issaquah Creek: Early Residential Flood Hazard Mitigation	Elevate or otherwise mitigate flood risks to repetitive loss property - (Smith-2223069015). Supports recommendations ERA-1 and ERA-4.	\$ 66,000
N	N	N	Issaquah Creek: Early Residential Flood Hazard Mitigation	Elevate or otherwise mitigate flood risks to repetitive loss property - (Wade - 2616800580). Supports recommendations ERA-1 and ERA-4.	\$ 66,000
N	N	Y	Issaquah: Streambank Stabilization	Explore soft bank stabilization options at 3 sites along Issaquah Creek where roads and other infrastructure are at risk from erosion; 252nd St. extends ~500 LF	\$ 519,000
N	N	Y	Jan Road-Rutledge Johnson Levee Setbacks	Remove portions of both levees that solely protect open space land. Segments of existing levees constrict conveyance and direct erosive flood flows into the Cedar River Trail and SR-169.	\$ 955,000
N	N	Y	Lower Jones Road Setback Project	Purchase the homes and property and set back road and associated revetment to improve conveyance and capacity.	\$ 4,408,000
N	N	Y	Rainbow Bend Levee Setback and Floodplain Reconnection	Setback levee to achieve improved conveyance and floodplain capacity.	\$ 1,733,000
N	N	N	Rhode Levee Setback and Home Buyouts	Purchase homes along path of fastest, deepest flood flow, and set back the levee.	\$ 3,518,000
N	N	Y	Sammamish Bank Stabilization and Restoration	Setback banks and improve structural integrity through installation of riparian vegetation and additional instream features.	\$ 3,299,000
Y		Y	Willowmoor Floodplain Restoration	Improve conveyance at the outlet of Lake Sammamish for flood risk reduction purposes.	\$ 2,944,000
15 Built Capital Projects + 18 Acquisition Projects					\$ 82,823,000

Project Name: Brassfield Revetment Setback and Acquisition Project (Cedar River)

Estimated Cost: \$1,821,000

WRIA#: 8

River Mile # to RM #: 6.5 – 7.3

Right bank, Left bank, or Both banks: Right bank

Jurisdiction(s): Unincorporated King County

Public or Private lands: Private land (some proposed for acquisition)

Agriculture Production District or Farmland Preservation Program lands: No

What's At Risk: Residential homes; flood protection facilities; Jones Road

Problem Statement: Revetments line both sides of the river, armoring against the natural tendency of the river to migrate in this area. However, the banks throughout this area are over steepened, and the flood protection facilities are a major encroachment into the river channel, constraining flows, creating higher velocities and elevated flood levels. The Brassfield Revetment armors the right bank, providing a level of flood protection to a row of single family homes and Jones Road. The homes are built just along the top-of-bank, and are located in the floodplain and, more significantly, appear to be in the channel migration hazard area of the Cedar River (based on preliminary findings of a channel migration zone study currently underway). While the homes are above the flood elevation for low to moderate floods, they are immediately adjacent to the riverbanks which are highly vulnerable to flood damage. The flood protection facilities on both banks have experienced significant damages in recent floods, and while they have been repaired, they remain vulnerable to further erosion and scour damage. Further flood damage on this bank could lead to undercutting beneath the homes and Jones Road behind them.

Proposed Project or Action: Pursue flood buyouts for homes within this flood-prone area as well as revetment setback or removal opportunities.

Project Benefits: Increase floodplain capacity; improve integrity and reduce maintenance costs for Brassfield and Riverbend Revetments; improve storage and conveyance; enhance riparian and floodplain habitat conditions.

Coordination: Residents

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Cedar Rapids Levee Setback

Estimated Cost

\$1,500,000 total. River and Floodplain Management Program share: \$137,000

Location Information

Water Resource Inventory Area 8, Cedar River

River Mile 7.3 to 7.75, Both Banks

Council District 9

Jurisdiction: Unincorporated King County

Public or Private lands

No Agricultural Production District or Farmland Preservation Program lands

Problem Statement

Levees on both banks in this area constrict the floodway, increasing velocities and flood depths within the channel, resulting in a higher risk of scour and erosion to flood protection facilities within and downstream from the site, including the flood protection facilities at Ricardi, Riverbend and Brassfield-Maxwell, as well as Jones Road. In the early 1990s, two severely flood-prone homes on the right bank were purchased, the structures were removed, and the lands were designated as permanent open space. The Ricardi Levee that formerly protected the homes, however, was left in place and remains an impediment to flood conveyance and floodplain processes. Similarly, on the left bank, the Riverbend Levee cuts off conveyance through about 5 acres of undeveloped floodplain land along the upstream portion of a 100-unit mobile home park. The position of these levees, right at the edge of the low flow channel, unnecessarily isolates the river from its adjacent floodplain, increasing the risk of flood damage to these and neighboring flood protection facilities and limiting natural habitat-forming processes.

What Is at Risk

Risks identified in the 2006 King County Flood Hazard Management Plan Policy G-2 that participation in this project is intended to reduce or eliminate include:

- Risk to public safety if setbacks are not designed and constructed in a manner that maintains or exceeds the current level of protection afforded to downstream residential areas on both the left and right bank of the river;
- Damage to public infrastructure, including Jones Road, if levee setback on right bank is not designed and constructed in a manner that maintains or exceeds the current level of protection from erosion hazards;
- Damage to privately owned structures if setback levees are not designed and constructed in a manner that maintains or exceeds the current level of protection afforded to downstream residential areas on both the left and right bank of the river.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Proposed Project or Action

Additional acquisitions of adjacent and contiguous lands on both the left bank and the right bank would create an opportunity to set back the existing levees and restore beneficial floodplain functions and processes. The project will involve removing or setting back approximately 800 linear feet of fill and riprap making up the right bank levee and setting back a similar length of levee on the left bank, in order to open up the floodplain to more frequent overbank flows while continuing to maintain existing levels of flood protection to Jones Road and downstream properties, including the mobile home park. The long-range plans for this area could include acquisition of additional properties remaining at risk from flood hazards and set back of greater length or extent.

Project Benefits

The project will provide both flood reduction benefits and habitat enhancement. Setting back the levee will allow high flows to spread across the floodplain, thereby reducing flood elevations and erosive velocities through this reach. Additionally, it will reconnect the river with its floodplain and allow natural floodplain processes, such as channel migration or side-channel formation, to occur. It is anticipated that off-channel habitat will form and be available for rearing, and instream habitat will be improved for spawning by salmonids.

Coordination

The project will be managed and constructed by the River and Floodplain Management Program consistent with the 1997 Cedar River Basin Plan. It will also be coordinated with the King County Department of Transportation, which manages some of the lands, and the Salmon Recovery Funding Board for funding of some of the work. This project is also a recommendation in the salmon habitat recovery plan for Water Resource Inventory Area 8, and will be conducted in coordination with the efforts associated with that plan.

Other Information or Needs

Negotiations are currently underway to acquire the properties needed to accommodate the levee setback. Coordination with current and future land managers will also be needed.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Dorre Don Meanders Project (Cedar River)

Estimated Cost: \$14,589,000

WRIA#: 8

River Mile # to RM #: 15.8 – 17.0

Right bank, Left bank, or Both banks: Both banks

Jurisdiction(s): Unincorporated King County

Public or Private lands: Private lands

Agriculture Production District or Farmland Preservation Program lands: No

What's At Risk: Repetitive loss area homes; flood protection facilities; trail bridge

Problem Statement: This area contains relatively dense residential use in areas of deep and fast flow. Flows overtop both leveed and unleveed sections at moderate flood events. The area is typified by wide meander bends and active side channels, and is subject to severe channel migration and avulsion hazards, which can flood homes or cut-off access. Due to the extent of residential development already located in high hazard areas throughout this reach, the level of risk is large, and the problem is not conducive of a single or simple solution.

Proposed Project or Action: This area will be included in the Cedar River Residential Flood Hazard Mitigation Analysis, recommended separately. This project identifies one possible solution that could be recommended as the outcome of the analysis. Pursue flood buyouts for homes within this repetitive loss area reach as well as levee setback or removal opportunities. This work could be implemented independently from the study, without jeopardizing other long term solutions that might be recommended subsequently.

Project Benefits: Reduce risks to homes; improve integrity and reduce maintenance costs for Dorre Don area levees and revetments; increase floodplain capacity; improve storage and conveyance; enhance riparian and floodplain habitat conditions.

Coordination: Residents

Other Information or Needs:

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Elliott Bridge Levee Setback and Acquisition Project (Cedar River)

Estimated Cost: \$1,821,000

WRIA #: 8

River Mile # to RM #: 5.3 – 5.4

Right bank, Left bank, or Both banks: Both banks

Jurisdiction(s): Unincorporated King County

Public or Private lands: Private and public lands

Agriculture Production District or Farmland Preservation Program lands: No

What's At Risk: Repetitive loss area homes

Problem Statement: Homes downstream of the new Elliott Bridge are subject to severe flood hazards, including high velocity flows and channel migration. Three of the homes in this area are identified as FEMA repetitive flood loss properties; one has already been mitigated, another is currently undergoing mitigation, and the third would be mitigated by this project. In addition, a major landslide hazard is located immediately downstream from the homes. Blockage of the river due to landslide activity recently caused flows to back up in and around the nearby homes, and the potential for future slides further increases flood risks in this area. Both sides of the river have levees covering a portion of the banks in this area, but these facilities provide limited protection – they do not fully tie into high ground, they overtop at moderate to higher flood events, and they only extend coverage to a portion of the homes in this area. The location of the levees on opposing banks tends to constrict flood flows through this area, increasing velocities and damage vulnerability.

Proposed Project or Action: Pursue voluntary buyouts for homes within this repetitive loss area. Setback levees and bank lines where feasible, including the abandoned bridge approach fill prism.

Project Benefits: Mitigate risk to homes; reduced maintenance costs for Orting Hill and Elliott Bridge revetments; increase floodplain capacity; improve storage and conveyance; enhance riparian and floodplain habitat conditions.

Coordination: Residents; King County Roads Division

Other Information or Needs:

Project Area Map (if available):

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Cedar Grove Mobile Home Park Acquisition

Estimated Cost \$4,349,000

Project Location Information

Water Resource Inventory Area 8, Cedar River

River Mile 10.75 to 11.10, Right Bank

Council District 9

Jurisdiction: Unincorporated King County

Private lands

No Agricultural Production District or Farmland Preservation Program lands

Problem Statement

The Cedar Grove Mobile Home Park is located entirely within the floodplain and a high hazard overbank flood path of the Cedar River. Repeated flooding and damage of property and basic services have made this perennially one of the highest flood risk areas in the basin. In 1990, flows overtopped the levee upstream, inundating the entire area, which caused the septic system to fail, contaminated the drinking water supply, cut off the sole access in and out of the area, and damaged residents' homes.

What Is at Risk

Risks identified in the 2006 King County Flood Hazard Management Plan Policy G-2 that this project is intended to reduce or eliminate include:

- Risk to public safety if residents are caught unaware of flood conditions or attempt to enter or reenter flooded areas;
- Risk to public safety if fire and rescue personnel are called upon to aid those unable or unwilling to evacuate flooded homes;
- Damage to privately owned structures.

Proposed Project or Action

Acquire the entire flood-prone property (at fair market value); assist in relocating park residents; remove the homes and all associated structures; and decommission and remove supporting infrastructure, such as the road, utilities, septic systems, and water supply wells.

Project Benefits

This project will eliminate all future flood damage and safety risks for these residents. There is also a considerable efficiency in administering the project across the entire neighborhood: public infrastructure that supports residential use in this area will no longer need to be maintained; the construction costs for removal of the structures will be minimized because properties are contiguous; and it will make a complete project for this area. It will build on similar projects in the reach immediately upstream, and will expand on the benefits associated with allowing for natural floodplain processes. It will also pave the way for a future restoration project extending

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

along three quarters of a mile of the Cedar River from the Cedar Grove Road Bridge downstream through the Cedar Grove Mobile Home Park.

Coordination

This project is also a recommendation in the Cedar River Basin Plan (King County 1997) and the salmon habitat recovery plan for Water Resource Inventory Area 8. Some time has passed since the owner of the mobile home park expressed interest in selling to King County, and his current level of interest is not known. Coordination with current property owners will be needed.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Littlefield-Cummins to Belmondo Project (Cedar River)

Estimated Cost: \$5,181,000

WRIA #: 8

River Mile # to RM #: 9.3 – 10.4

Right bank, Left bank, or Both banks: Left bank

Jurisdiction(s): Unincorporated King County

Public or Private lands: Public and private

Agriculture Production District or Farmland Preservation Program lands: No

What's At Risk: homes, trail, SR-169

Problem Statement: This reach contains several left bank flood protection facilities and a bridge, and is underlain by one of the river's few areas of bedrock. On the right bank, significant landslide hazard areas immediately abut the river in two locations, and is bounded by bedrock in between. Toward the upstream end of this reach, the river is highly mobile. The tendency for the river to avulse and migrate by as much as several hundred feet in a single flood event has been demonstrated repeatedly in the recent past. The flood of November 2006 precipitated another one of these avulsions, bringing the river right up against the left bank revetment protecting SR-169 and the Cedar River Trail. The flood caused severe damage to this facility, including loss of toe rock and major areas of slumping. The already oversteepened bank is at risk of further erosion or scour, which could lead to failure of the trail and possible flooding of the primary highway serving this corridor. Toward the downstream end, the left bank Cummins and Littlefield revetments provide limited reduction in overbank flooding affecting one or two homes. However, flood protection is only afforded by these facilities at low to moderate flood events. Two more sections of Cedar River Trail revetment are located on the left bank within this segment, and may also be vulnerable to scour, erosion, or slumping. These multiple revetments, in combination with the landslide hazards and bedrock outcroppings, create a constriction to flood conveyance and channel process through this reach.

Proposed Project or Action: Acquire homes that are located in the floodplain and severe channel migration hazard area. Setback or remove levees and revetments, where feasible, to allow the river to occupy a greater portion of its floodplain, while still protecting remaining homes and landward public infrastructure. Repair, retrofit, or reconstruct sections of damaged facilities that are essential to the protection of public infrastructure, using techniques that will complement other ongoing regional initiatives in this highly-valued natural resource area.

Project Benefits: Mitigate flood risks to homes; improve structural integrity and long-term viability, and reduce maintenance costs of essential flood protection facilities; increase floodplain capacity; improve storage and conveyance; and enhance riparian and floodplain habitat conditions.

Coordination: Residents; King County Parks Division

Other Information or Needs:

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Lower Lions Club to Cedar Grove Road Project (Cedar River)

Estimated Cost: \$1,050,000

WRIA #: 8

River Mile # to RM #: 11.5 – 11.85

Right bank, Left bank, or Both banks: Left bank

Jurisdiction(s): Unincorporated King County

Public or Private lands: Public and private

Agriculture Production District or Farmland Preservation Program lands: No

What's At Risk: Repetitive loss area homes, residential roads, and an arterial road

Problem Statement: Flood flows overtop the revetment at Byers Bend, run through the neighborhood, and combine with high velocity flows overtopping the MacDonald levee on the left bank. This overbank flooding threatens several homes, including repetitive loss properties, and their sole access road. At the downstream end of this segment, Cedar Grove Road near its intersection SR-169 bisects and obstructs the flood path, making it susceptible to damage and causing backwater effects through the neighborhood. The overbank flow from the neighborhood upstream floods the road as it passes over its lowest section, then drops off the shoulder and steep embankment on the downstream side where it re-enters the river. As a result, the road is prone to washouts and closures along this important transportation connection.

Proposed Project or Action: Acquire repetitive loss properties as well as adjacent flood-prone homes and parcels. Opportunities could then be pursued to reconfigure or remove the MacDonald Levee to reduce channel confinement and reconnect flows in the river with the flows across the floodplain. The sole access road serving the remaining homes should be relocated to the landward side of the properties. Once complete, solutions should be explored to modify the configuration of Cedar Grove Road to address the backwater behind the road and allow overbank conveyance to more safely re-enter the river.

Project Benefits: Mitigate risks to residential homes; protect public infrastructure and transportation functions; reduce maintenance costs for MacDonald Levee; increase floodplain capacity; improve flood storage and conveyance; enhance riparian and floodplain habitat conditions.

Coordination: Residents; King County Roads Division

Other Information or Needs:

Project Area Map (if available):

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Maplewood Acquisition and Levee Setback Project (Cedar River)

Estimated Cost: \$9,016,000

WRIA #: 8

River Mile # to RM #: 3.3-4.25

Right bank, Left bank, or Both banks: Right bank

Jurisdiction(s): Unincorporated King County

Public or Private lands: Private

Agriculture Production District or Farmland Preservation Program lands: No

What's At Risk: Flood-prone homes

Problem Statement: A densely populated residential neighborhood on the right bank is subject to a number of flood-related hazards. Two to three homes at the upstream end experience overbank flooding during moderate flood events when the Erickson Revetment is overtopped. The Brodell Revetment, located at the downstream end of the neighborhood, primarily functions to reduce erosion that might allow the channel to migrate toward SR-169. According to a new mapping study by the City of Renton, more than half the neighborhood would be inundated by shallow flooding in a 100-year event. In addition, an active landslide scarp is located directly across the river from the neighborhood. The Person Revetment was built on the left bank to stabilize the base of the landslide-prone slope, but it ultimately provides minimal protection against a landslide feature of such large scale. The occurrence of a major landslide here could block all or a portion of the channel suddenly and unexpectedly, and could force deep and fast river flows across the residential area with potentially devastating results.

Proposed Project or Action: Acquire the flood-prone homes immediately behind the Erickson Revetment. Set back the banks throughout the reach to increase conveyance and reduce erosion and scour velocities, especially against the landslide-prone bank. This can be accomplished independently or in combination with additional flood buyouts from willing sellers in this neighborhood. Bank work should incorporate the use of bioengineering and other techniques to reduce rock armoring. Where possible explore opportunities to restore connection between the river and the floodplain to improve conveyance, increase floodplain capacity, and restore riparian habitat.

Project Benefits: Mitigate residential flood risks for acquired homes; reduce risk of flooding to remaining homes; improve structural integrity and reduce maintenance costs for Erickson revetment; increase floodplain capacity; improve storage and conveyance; reduce velocities; enhance riparian and floodplain habitat conditions.

Coordination: Residents

Other Information or Needs:

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Orchard Grove Project (Cedar River)

Estimated Cost: \$3,837,000

WRIA #: 8

River Mile # to RM #: 17.0 – 17.6

Right bank, Left bank, or Both banks: Right bank

Jurisdiction(s): Unincorporated King County

Public or Private lands: Private

Agriculture Production District or Farmland Preservation Program lands: No

What's At Risk: Repetitive loss area homes

Problem Statement: A continuous line of homes along the right bank are located in severe flood hazard areas. These homes, including some repetitive loss properties, are subject to flooding due to both inundation and erosion. Along the upstream portion of this segment, all but a few of the homes are in the floodway, but the extent and frequency of overbank flooding has been reduced for low to moderate floods by the Orchard Grove Levee. However, this flood protection facility does not provide protection for higher flows, nor does it tie into high ground at its downstream terminus, so even the homes behind the levee remain susceptible to overtopping and backwater flooding. While the benefits are limited, the flood protection facility does remain largely intact, and due to growth of riparian vegetation along the banks, the downstream end of the flood protection facility has started to accumulate a sand and gravel bar along the channel margin. This slows localized velocities, reducing risk of future scour or erosion along the bank. In the downstream portion of this segment beyond the end of the facility, the homes are largely located outside the floodway, but are in the floodplain as well as the area that appears to be the severe channel migration hazard area (based on preliminary findings of the channel migration zone study currently underway). These homes are at risk from both overbank flooding and back erosion. Fortunately, the sole access road for the entire area is just outside the boundaries of these severe flood hazards.

Proposed Project or Action: This area will be included in the Cedar River Residential Flood Hazard Mitigation Analysis, recommended separately. This project identifies one possible solution that could be recommended as the outcome of the analysis. Identify willing sellers and acquire flood prone homes. Depending on site-specific conditions, where acquisitions eliminate the risks to homes, existing levees could be setback, modified, or removed in order to reconnect areas of the floodplain with the river, improving conveyance as well as restoring off-channel habitat. This work could be implemented independently from the study, without jeopardizing other long term solutions that might be recommended subsequently.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Benefits: Mitigate flood hazards to residences; improve integrity and reduce maintenance costs for Orchard Grove Levee; increase floodplain capacity; improve storage and conveyance; enhance riparian and floodplain habitat conditions.

Coordination: Residents

Other Information or Needs:

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Cedar River Gravel Removal Project

Estimated Cost: \$4,827,000

Location Information

Water Resource Inventory Area 8, Cedar River

River Miles 0 to 1.25, 3.5 and 21

Council District 5

Jurisdiction: Renton

Public lands

No Agricultural Production District or Farmland Preservation Program lands

Problem Statement

On average, 10,000 to 12,000 cubic yards of gravel passes as bedload through the lower mainstem Cedar River each year. Of that, about half is deposited in the lowest 1.25 miles of the river at an average annual rate of gravel accumulation of about 6,000 cubic yards per year, while the balance comes to rest on the delta in Lake Washington. Rates of bedload yield from the basin and subsequent deposition in the lower Cedar River can fluctuate greatly in any given year from these annual average values. This ongoing deposition occurs in a segment of the Cedar River that lies adjacent to Renton Municipal Airport, Boeing property, areas of downtown Renton, and other public and private properties. Periodic dredging of gravel and sediment has been employed to maintain flow conveyance through this reach in order to avert flood damages to the regionally significant economic investments clustered in the vicinity. Gravel and sediment removal was last performed in 1998, and simultaneously, improvements were made to the levees and floodwalls along both right and left banks of the river to provide 100-year flood protection to the area.

The 1998 gravel and sediment removal and structural improvement project, entitled the Lower Cedar River Section 205 Flood Hazard Reduction Project (known as the Lower Cedar 205 Project), was constructed through a partnership among the City of Renton, the U.S. Army Corps of Engineers, and King County. The City of Renton, as the local project sponsor, signed a formal agreement committing to ongoing maintenance of the bed elevation of the channel to ensure long-term benefits of the project. Each year, a detailed sediment study of the lower Cedar River is conducted to ensure that the allowable bed elevation is not reached, and hydraulic modeling is performed to predict sediment capacity associated with gravel removal maintenance intervals.

In addition to the maintenance responsibilities, project permits required extensive mitigation for the initial construction impacts and impacts associated with the anticipated future maintenance dredging. Mitigation features for the Lower Cedar 205 Project included creation and enhancement of off-channel habitat and gravel supplementation in upstream river reaches. Gravel supplementation involves depositing gravel, suitably sized for spawning, into the upstream reaches of the river below the dams (which prevent the natural recruitment of gravel). Off-channel habitat was expanded by excavation of a groundwater-fed spawning channel to provide sockeye spawning habitat as well as rearing and refuge habitat for coho and Chinook

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

salmon. The 2001 Nisqually Earthquake, however, caused a landslide that blocked the main channel of the Cedar River, resulting in the occupation of the groundwater spawning channel by the river, and ultimately the loss of the spawning channel habitat as a mitigation site. Replacement mitigation is needed to meet the permit requirements.

What Is at Risk

Risks identified in the 2006 King County Flood Hazard Management Plan Policy G-2 that this project is intended to reduce or eliminate include:

- Risk to public safety if homes, businesses and industrial areas in downtown Renton are inundated due to reduced channel capacity;
- Risk to the local economy if homes, businesses and industrial areas in downtown Renton are inundated due to reduced channel capacity;
- Risk to public safety if fire and rescue personnel are called upon to aid those unable or unwilling to evacuate flooded homes and businesses;
- Damage to public infrastructure, including drainage systems, roads and public facilities;
- Damage to privately owned structures.

Proposed Project or Action

The proposed action includes three elements: periodic gravel removal, spawning channel replacement and upper watershed gravel supplementation.

The periodic gravel removal maintenance will be performed to maintain the project flood protection benefits as required in the Project Cooperation Agreement between the City of Renton and the U.S. Army Corps of Engineers. The threshold for periodic gravel removal maintenance is based on ensuring flood protection against the 100-year recurrence interval event with at least 90 percent reliability. During gravel removal maintenance actions, the Cedar River channel within the project area will be excavated to a depth of 4 feet below the 1995 bed profile. The average annual maintenance dredging as estimated by the U.S. Army Corp of Engineers is expected to be \$2.4 million every three years.

To replace the lost ground water spawning channel, the spawning channel replacement project is proposed at River Mile 3.5. The spawning channel replacement is targeted for construction in 2006 or 2007. It will consist of constructing a 950-foot long by 10-foot wide channel that contains large woody debris, native plants and spawning gravel and is connected to the Cedar River with an inlet structure.

The gravel supplementation, which is also carried out for mitigation purposes, is performed annually prior to August 15. The gravel supplementation is placed during the summer low-flow period in a berm in the Landsburg reach at River Mile 21.0. As of August 2005, a total of 4,000 cubic yards of gravel has been placed at the Landsburg Gravel Supplementation site and it is anticipated that at a minimum an additional six years of gravel supplementation will be necessary to place the required 10,000 cubic yards of spawning gravel. The cost for the gravel supplementation is between \$25,000 and \$35,000 annually.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Extensive spawning surveys, fry out-migration surveys, vegetation monitoring and maintenance, and other monitoring will be performed as required for the gravel removal project and associated mitigation projects.

Project Benefits

The existing channel bed will be maintained at a level that will ensure that 100-year flood protection is provided through the project area to minimize future damage to Renton Municipal Airport, Boeing property, areas of downtown Renton, and other public and private properties in the project area. The U.S. Army Corp of Engineers has determined that the flood protection benefits provided by the construction of the Lower Cedar River Section 205 Flood Hazard Reduction Project and the associated periodic maintenance dredging provides an average annual benefit of \$7,797,000.

Coordination

This project will require, at a minimum, coordination among Boeing operations personnel, FEMA, the Washington Departments of Fish and Wildlife and Ecology, the Muckleshoot Indian Tribe, the City of Renton, the National Oceanographic and Atmospheric Administration–Fisheries, the U.S. Army Corps of Engineers–Seattle District and other public agencies and private property owners adjacent to the project area. The proposed spawning channel replacement project will require easements from Seattle Public Utilities and Shadow Hawk, and temporary construction easements will need to be obtained from private property owners.

Other Information or Needs

This project contains habitat enhancement requirements from the Washington Department of Fish and Wildlife, National Oceanic and Atmospheric Administration–Fisheries, and the Muckleshoot Indian Tribe. These requirements include gravel replacement at Landsburg and annual operation and monitoring reports.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Riverbend Mobile Home Park Acquisition and Levee Setback Project (Cedar River)

Estimated Cost: \$6,525,000

WRIA #: 8

River Mile # to RM #: 6.5 – 7.5

Right bank, Left bank, or Both banks: Left bank

Jurisdiction(s): Unincorporated King County

Public or Private lands: Private

Agriculture Production District or Farmland Preservation Program lands: No

What's At Risk: Riverbend Mobile Home Park residents, homes and infrastructure

Problem Statement: Levees and revetments constrain both sides of the river in much of this segment, creating high velocities and elevated flood levels. As a result, these flood protection facilities are highly susceptible to erosion and scour. The Riverbend Levee on the left bank has two primary functions. At its upstream end, it abuts the Riverbend Mobile Home Park reducing erosion and undercutting, especially along the front row of about 15 mobile homes. The downstream extension of the Riverbend levee protects the ecologically-significant Cavanaugh Pond from regular overtopping and channel migration, although this armoring may interfere with beneficial ecosystem processes. The banks throughout this segment are over steepened, and the flood protection facilities are a major encroachment into the river channel, leading to increased velocities, reduced instream habitat, and inadequate riparian buffer. The flood protection facilities on both banks experienced significant damage in recent floods. While these facilities have been repaired, they remain vulnerable to damage in future floods.

Proposed Project or Action: Explore the acquisition of either the entire mobile home park or a portion of it (e.g., the riverward-most homes and the property underlying them). Setback or remove the existing levee where possible (depending upon the extent of property acquisition) to improve flood conveyance through the reach, reducing flood impacts on neighboring properties and facilities as well as improving habitat.

Project Benefits: Mitigate flood hazards to residences, improve long term integrity and reduce maintenance costs for the Riverbend levee; increase floodplain capacity; improve storage and conveyance, enhance riparian and floodplain habitat conditions

Coordination: Mobile home park owner; mobile home park residents

Other Information or Needs:

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Upper Jones Road Acquisition and Revetment Setback Project (Cedar River)

Estimated Cost: \$3,837,000

WRIA #: 8

River Mile # to RM #: 6.5 – 8.3

Right bank, Left bank, or Both banks: Right bank

Jurisdiction(s): Unincorporated King County

Public or Private lands: Private

Agriculture Production District or Farmland Preservation Program lands: No

What's At Risk: residential homes at risk from channel migration and erosion, Scott - Indian Grove Revetment

Problem Statement: A number of homes on the right bank along upper Jones Road are located in an area of severe channel migration (based on preliminary findings of the channel migration zone study currently underway). Toward the middle of this segment, several additional homes are behind the Scott -Indian Grove Revetment which is oversteepened, partially damaged from recent floods, and highly vulnerable to future flood damage. Most of the homes are on relatively high ground, and are not known to experience regular flooding. However, they are susceptible to undermining by channel migration or erosion. At the downstream end, there are no homes at risk, but the Scott-Indian Grove revetment constricts conveyance, deflects flows toward the Cedar River Trail Revetment, and prevents natural river processes and establishment of an adequate riparian buffer.

Proposed Project or Action: The homes are not known to experience regular flooding, but are susceptible to undermining by channel migration or erosion along the oversteepened banks that comprise the flood protection facility. One possible alternative to address these over-steepened banks would set back the banks to a more gradual slope and a more stable configuration. This could be accomplished independently or in combination with possible flood buyouts from willing sellers in this neighborhood.

Project Benefits: Mitigate flood hazards to residences; improve structural integrity and stability of the flood protection facility; increase floodplain capacity; improve flood storage and conveyance; enhanced riparian and floodplain habitat conditions.

Coordination: Residents

Other Information or Needs:

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: WPA Levee Setback and Acquisition Project (Cedar River)

Estimated Cost: \$1,821,000

WRIA #: 8

River Mile # to RM #: 10.65 – 11.0

Right bank, Left bank, or Both banks: Left bank

Jurisdiction(s): Unincorporated King County

Public or Private lands: Private

Agriculture Production District or Farmland Preservation Program lands: No

What's At Risk: residential homes at risk from channel migration and erosion; WPA Levee

Problem Statement: The WPA levee reduces the risk of channel migration and provides a minimal level of protection from overbank flooding to five homes on the left bank which are located in the floodway and the area of severe channel migration (based on preliminary findings of the channel migration zone study currently underway). This levee, which provides only low to moderate flood protection, also constricts flow conveyance through this segment, which exacerbates the flood risks for the mobile home park located on the opposite bank. The levee's bank armor also inhibits establishment of adequate stream buffer in an area that includes some of the highest quality instream habitat in the lower Cedar River.

Proposed Project or Action: Evaluate the feasibility and effectiveness of setting back the banks to increase conveyance, independently or in combination with possible flood buyouts. Depending on site-specific conditions, where flood risks to homes are eliminated through acquisitions, the levee could be widely setback or removed.

Project Benefits: Mitigate flood hazards to residences; improve long term integrity and reduce maintenance costs of levee; increase floodplain capacity; improve storage and conveyance; enhance riparian and floodplain habitat conditions

Coordination: Residents

Other Information or Needs:

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Getchman Levee Setback and Floodplain Reconnection

Estimated Cost: \$2,670,000

Location Information

Water Resource Inventory Area 8, Cedar River

River Mile 13.75 to 14.05, Right Bank

Council District 9

Jurisdiction: Unincorporated King County

Public and Private lands

No Agricultural Production District or Farmland Preservation Program lands

Problem Statement

The Getchman Levee was built to prevent bank erosion and channel migration toward several homes and a section of Maxwell Road. The two most severely flood-prone homes located behind the Getchman Levee have been acquired and removed. The levee, in combination with the Rhode Levee on the opposite bank (see Rhode Levee Setback and Home Buyouts), severely constricts flood conveyance through this reach. This type of channel confinement tends to increase localized scour velocities and flood elevations, increasing the frequency of overtopping and exacerbating flood damage and risks to both the flood protection facilities and the surrounding residential properties. Both levees overtop at moderate flows, surrounding a number of the homes on the opposite bank with deep and fast flows. In addition to these flood impacts, the Getchman Levee disconnects the river from its floodplain, an historical oxbow channel, and the lower end of Taylor Creek, diminishing the ability of the river and its buffer to provide valuable habitat.

What Is at Risk

Risks identified in the 2006 King County Flood Hazard Management Plan Policy G-2 that this project is intended to reduce or eliminate include:

- Risk to public safety if residents are caught unaware of flood conditions or attempt to enter or reenter flooded areas;
- Risk to public safety if fire and rescue personnel are called upon to aid those unable or unwilling to evacuate flooded homes;
- Damage to public infrastructure, including local county roads and flood protection facilities;
- Damage to privately owned structures.

Proposed Project or Action

The Getchman Levee should be set back to reconnect the river with its floodplain in order to establish a greater area for flood conveyance and natural floodplain processes. The setback should be designed to maintain protection for Maxwell Road while opening up access for flow in the floodplain where homes have been removed or are sufficiently set back from the riverbank. A hydraulic model should be updated to reflect the new topographic conditions, and the results evaluated to determine the impact on flood hazards and future projects in the vicinity, such as

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

along the Rhode Levee on the opposite bank. The one remaining home located behind the levee may still be at risk from flooding, and should be considered for acquisition as part of a long-term flood hazard management strategy.

Project Benefits

Setting back this flood protection facility will provide substantial flood and habitat benefits. By reducing the channel confinement, high flows will be able to spread out over the right bank to reduce flood elevations and velocities through this section of river. This will reduce the extent of future repairs to King County-maintained flood protection facilities on both the right and left banks. It will also lower flood risks to the remaining homes and properties, especially the highly flood-prone homes across the river. Additionally, a setback will allow the river to reoccupy the remnant oxbow and to interact with lower Taylor Creek, creating a more complex channel network.

Coordination

This project will need to be coordinated with any modification to the Rhode Levee and with agencies implementing the salmon habitat recovery plan for Water Resource Inventory Area 8 and the Cedar River Basin Plan. Design of this project should be coordinated with other resource management entities to build upon the substantial habitat improvements already underway for the lower reach of Taylor Creek that runs through the Cedar River floodplain in this reach. Elements of project design that address the need to protect Maxwell Road will need to be coordinated with the King County Department of Transportation.

Other Information or Needs

An evaluation of flood risks should be made in conjunction with design of this project to determine the need for acquiring the last remaining home behind the levee. The homeowner has expressed a willingness to discuss this option with King County. Any actual acquisition will depend upon securing funding and reaching agreement with the property owner on purchase of the property.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Herzman Levee Setback and Floodplain Reconnection

Estimated Cost \$1,023,000

Location Information

WRIA #8

River Mile 6.5 to 6.7, Right Bank

Council District 9

Jurisdiction: Unincorporated King County

Private lands

No Agricultural Production District or Farmland Preservation Program lands

Problem Statement

The Herzman Levee extends 17 to 18 feet high in an over-steepened configuration lining 840 feet of river bank. While the levee reduces the risk of channel migration, it is not continuous with high ground and does not provide flood containment. Seepage is common behind the levee in an area of low undeveloped floodplain formerly occupied by the river. Several residential properties, as well as a section of Jones Road, are located further behind the levee. These structures are set back several hundred feet from the river on a section of high ground above the flood elevation, and they do not experience flooding as a result of the seepage, overtopping or backwater behind the levee. The flood protection facility, therefore, unnecessarily constricts flows within the channel, forcing the full momentum of the river directly into Cedar River Trail levee on the immediate opposite bank. This significantly increases the risk of flood damage to that levee, which protects both the trail and the Maple Valley Highway (State Route 169). In addition, the Herzman levee prevents the river's ability to occupy the undeveloped land immediately behind the levee, and in doing so obstructs the natural floodplain processes, reducing the quality and quantity of riparian habitat, and preventing development of a healthy vegetative buffer in an area of high fish use.

What Is at Risk

Risks identified in the 2006 King County Flood Hazard Management Plan Policy G-2 that this project is intended to reduce or eliminate include:

- Damage to public infrastructure, including the Cedar River Trail and State Route 169;
- Impact on regional economy if State Route 169 is severely damaged.

Proposed Project or Action

Remove approximately 350 linear feet of the levee and set back another 190 linear feet in a manner that will reconnect the river with its floodplain without increasing flood risks to the existing homes or Jones Road.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Benefits

Partial removal and set back of this flood protection facility will reduce channel confinement to allow overbank flows to spread across the right bank floodplains. The improved conveyance and floodplain function will reduce the erosive force of flood flows against the trail and road protection on the opposite bank, lower flood elevations, reduce velocities, and reduce vulnerability to flood damage for the flood protection facility itself. It will also improve instream habitat and provide for refuge during high flows for juvenile fish. Additional habitat enhancements such as planting native vegetation or creation of pools, side-channels or backwater areas, may be proposed in concert with, or subsequent to, this flood protection facility setback project.

Coordination

The project will be managed and constructed by the River and Floodplain Management Program in coordination in the Water Resource Inventory Area 8 Forum and Steering Committee. Construction of specific instream or off-channel habitat improvements may accompany or follow the removal of the flood protection facility. Elements that will directly affect individual properties will be coordinated with the property owners.

Other Information or Needs

There may be a need to acquire an additional easement along the undeveloped portion of the properties located behind the levee.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Issaquah Creek Streambank Stabilization Project (Issaquah Creek)

Estimated Cost: \$519,000

WRIA #: 8

River Mile # to RM #: in the vicinity of RM 11.5

Right bank, Left bank, or Both banks: both banks

Jurisdiction(s): Unincorporated King County

Public or Private lands: Public and private

Agriculture Production District or Farmland Preservation Program lands: No

What's At Risk: residential homes at risk from channel migration and erosion

Problem Statement: Erosion threatens the streambank in three locations, placing 500 linear feet of 252nd Street and a number of residential properties at risk.

Proposed Project or Action: Complete several bio-technical bank stabilization projects along approximately 1000 feet of Issaquah Creek, where erosion is threatening homes and roads.

Project Benefits: Mitigated flood hazards to residences, stabilized road embankment, reduced sediment loading to creek, enhanced riparian and floodplain habitat conditions

Coordination: Residents, King County Roads Division

Other Information or Needs:

Project Area Map (if available):

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Jan Road – Rutledge Johnson Levee Setbacks

Estimated Cost \$955,000

Location Information

WRIA 8

River Mile 13.15 to 13.45, Both Banks

Council District 9

Jurisdiction: Unincorporated King County

Public and Private lands

No Agricultural Production District or Farmland Preservation Program lands

Problem Statement

The Jan Road levee, on the right bank of the Cedar River, and the Rutledge-Johnson levee, on the left bank of the river, constrict flood flows and increase flow velocities through this reach. This constriction directs the full force of the river downstream, across the channel and into the Cedar River Trail Levee. The integrity of the trail levee is essential to flood protection for this regionally significant trail system and the adjacent Maple Valley Highway (State Route 169). A major bank failure at the Cedar River Trail Levee was repaired following the floods of 1995 and 1996; however, this over-steepened levee could not be reconstructed to a more stable slope angle due to its proximity to State Route 169. The repaired flood protection facility, therefore, remains over-steepened and vulnerable to future damage.

Neither the Jan Road Levee nor the Rutledge-Johnson Levee was designed to provide 100-year flood containment protection, nor are they tied off to high ground at either their upstream or downstream ends. As a result, the properties behind them are subject to flooding from water coming over the top of the levees as well as around the upstream and downstream ends. The upstream sections of both the Jan Road and Rutledge-Johnson levees do serve important flood protection functions: they reduce the frequency and severity of overtopping and prevent migration of the river channel. However, while the levees contain small floods, overtopping and flooding can occur during larger events, affecting several homes in the immediate vicinity.

In addition, Taylor Creek, which enters the river at the upstream end of the Jan Road levee, can exacerbate flooding behind the Jan Road levee. Floodwaters from this location can flow across Jan Road and through the neighborhood before re-entering the river further downstream. Toward the downstream ends of both the Rutledge-Johnson and Jan Road Levees, the areas immediately landward of the levee are undeveloped floodplain. At these locations, the two flood protection facilities unnecessarily direct the flow into the Cedar River Trail Levee, and separate the river from its floodplain. In addition, the levees were not designed or constructed to current standards and their rip-rap slopes sit at a relatively steep angle at the river's edge, resulting in a poorly vegetated riparian zone that is vulnerable to erosion and scour.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

What Is at Risk

Risks identified in the 2006 King County Flood Hazard Management Plan Policy G-2 that this project is intended to reduce or eliminate include:

- Risk to public infrastructure: erosion of the Cedar River Trail and State Route 169;
- Impact on regional economy if State Route 169 were extensively damaged.

Proposed Project or Action

Initial project actions will involve design of a flood protection facility retrofit for both the Jan Road and Rutledge-Johnson Levees to reduce the channel constrictions and associated high velocities. The initial design phase for the project will evaluate various alternatives that may include removal or setback of levee segments at the downstream end of each flood protection facility. The principle objective will be to allow higher flows, and the associated erosive energy, to be spread out and dissipated over a larger area of the floodplain, thereby reducing flood damage to the levees themselves and the Cedar River Trail levee. Engineering analyses will be used to determine the dimensions and alignment of the removal or setback alternatives in order to achieve the desired flood conveyance improvements without creating any undesirable flood impacts on neighboring homes and properties. Communication with local residents will take place both formally and informally during the project's design development and implementation phases to provide an opportunity for them to be involved and informed. Results of the design development phase of the project may indicate that additional property easements or ownership are needed to fully achieve the proposed conveyance and floodplain reconnection improvements as recommended. King County will work cooperatively with adjacent property owners to acquire conservation easements or other property interests, or to modify designs, as needed.

Project Benefits

Removal or set back of the downstream end of these levees will reduce the risk of damage to three important flood protection facilities, and will also provide habitat enhancement benefits. By reducing channel confinement, high flows can spread out and be safely conveyed across the floodplain, ultimately lowering flood elevations and velocities. This will reduce the risk of levee failure or damage to the regional trail, the Maple Valley Highway and the levee themselves. Routine and preventive maintenance costs will also be reduced over the long term. The modified levees will continue to provide the targeted flood benefits they currently provide in the form of reduced frequency of overtopping and reduced risk of channel migration in the vicinity of local residences.

While existing flood risks to neighboring homes will be lowered, they will not be eliminated. The floodplain extends almost to the valley wall through this reach, and the majority of homes in the neighborhood immediately downstream from this project are located in the floodway. Aerial photos taken during past flood events show many of these downstream homes to be surrounded by floodwaters, and channel migration studies show a history of multiple flow locations in this reach. The proposed project is therefore only a part of a comprehensive solution, but would not preclude future efforts to minimize bank erosion along King County-maintained flood protection facilities, reduce vulnerability of the major arterial roadway, and reduce the frequency and severity of overbank flooding across Jan Road and throughout the neighborhood.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Other benefits of the proposed project include increased channel complexity and improved habitat conditions that result from giving the river greater freedom to interact with its floodplain. Setting back the existing levees will also create opportunities for future habitat restoration projects in the reconnected riparian corridor.

Coordination

The project will be managed and constructed by the River and Floodplain Management Program, in coordination with the Water Resource Inventory Area 8 salmon habitat recovery efforts. Elements that will directly affect individual properties will be coordinated with the property owners. Design and construction of specific instream or off-channel habitat improvements may accompany or follow the flood protection facility modifications.

Other Information or Needs

The levee has been maintained under the U.S. Army Corps of Engineers Rehabilitation and Inspection Program, and modifications may require additional coordination or authorization.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Lower Jones Road Setback Project

Estimated Cost \$4,408,000

Location Information

Water Resource Inventory Area 8, Cedar River

River Mile 5.5 to 6.2, Right Bank

Council District 9

Jurisdiction: Unincorporated King County

Public or Private lands

No Agricultural Production District or Farmland Preservation Program lands

Problem Statement

The entire length of Jones Road follows the Cedar River, much of which lies within the river's floodplain and areas of historical channel migration. At Buck's Curve, where the river immediately abuts the road shoulder, King County maintains a flood protection facility to protect the road. This flood protection facility is prone to scour and erosion and is vulnerable to significant structural damage during high flows. In addition, the confinement perpetuated by the armored right bank deflects flood flows directly toward the Cedar River Trail Revetment that protects not only the regional trail, but also the Maple Valley Highway (State Route 169) on the opposite bank. The revetment protecting the road regularly experiences flood damage and requires costly maintenance, but has no room within the existing right-of-way to be set back or retrofitted to a more stable slope.

What Is at Risk

Risks identified in the 2006 King County Flood Hazard Management Plan Policy G-2 that this project is intended to reduce or eliminate include:

- Risk to public safety if right bank residents are caught unaware of flood conditions or attempt to enter or re-enter flooded areas;
- Risk to public safety if fire and rescue personnel are called upon to aid those unable or unwilling to evacuate flooded homes;
- Damage to public infrastructure, including Jones Road, the Cedar River Trail and State Route 169;
- Impact on regional economy if State Route 169 is severely damaged;
- Damage to private structures.

Proposed Project or Action

The riverbanks should be set back along this entire length of river to provide more room for flood conveyance and to reduce the risks of ongoing flood damage. At its upstream end, the flood protection facility and about a 1,500-foot section of Jones Road will need to be relocated landward to accommodate a stable slope angle on the banks, improved conveyance in the channel, and a buffer separating the river and the road. This will require purchase of an easement through several contiguous properties on the landward side of the road, and may

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

require some additional property easements or acquisitions. As part of a longer term solution, the remaining high risk flood-prone homes downstream should be acquired; banks should be set back; and the riparian buffer should be restored with native vegetation. Elements of this project have already been initiated. In recent years, King County has purchased numerous homes along this reach for both flood hazard management and road construction purposes, reducing the number of vulnerable structures.

Project Benefits

The set back or removal of the armored banks would tend to lower flood elevations and velocities through the reach, reducing future flood damage and the subsequent need for repair to the road and flood protection facilities on both banks. This will also protect the usability of Jones Road, which is an important transportation corridor for residents throughout the adjacent valley. Removal of the flood-prone homes from the river's edge, implemented over the long term, will completely eliminate the flood risk for those residents. It would also allow for restoration of the riparian buffer and creation of projects to enhance habitat conditions in the area.

Coordination

This project will be coordinated with King County Department of Transportation for planning, design, and construction of modifications to the road. It would also be coordinated with the 1997 Cedar River Basin Plan implementation efforts, the salmon habitat recovery plan for Water Resource Inventory Area 8, and other regional resource management and permit agencies as appropriate. Elements that will directly affect individual properties will be coordinated with the property owners. Homeowner interest in buyout participation has not yet been assessed for this area.

Other Information or Needs

This project could be done in several phases; the road set back and home buyouts are not interdependent in most locations.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Rainbow Bend Levee Setback and Floodplain Reconnection

Estimated Cost \$1,733,000

Location Information

Water Resource Inventory Area 8, Cedar River

River Mile 11.3 to 11.5, Right Bank

Council District 9

Jurisdiction: Unincorporated King County

Private lands

No Agricultural Production District or Farmland Preservation Program lands

Problem Statement

The Rainbow Bend Levee on the right bank shunts deep, fast flood flows directly into the Cedar River Trail Revetment on the left bank. Together, these two flood protection facilities on opposite sides of the river severely constrict flows, particularly at flood stage, through this reach. This type of channel confinement tends to increase localized scour velocities and flood elevations, increasing the frequency of overtopping and exacerbating flood damage and risks to the flood protection facilities themselves as well as to neighboring residential and recreational uses. One of the greatest risks is erosion and scour along the levee protecting the regionally significant Cedar River Trail and the Maple Valley Highway (State Route 169). Further, the levee, which was not built to provide 100-year flood protection and provides neither sufficient freeboard nor ties into high ground at its downstream end, is subject to frequent overtopping, backwater flooding, and damage, leaving the properties it is intended to protect at risk for personal losses or property damages.

What Is at Risk

Risks identified in the 2006 King County Flood Hazard Management Plan Policy G-2 that this project is intended to reduce or eliminate include:

- Risk to public safety if sudden failure of the levee results in deep fast flows in the area behind the levee;
- Risk to public infrastructure: erosion of the Cedar River Trail and eventually State Route 169;
- Impact on regional economy if State Route 169 were extensively damaged;
- Damage to privately owned structures.

Proposed Project or Action

Once acquisition of the flood-prone properties immediately behind the levee is complete, the levee can be set back or removed to provide greater accommodation of flood conveyance and natural riverine processes within the extensive floodplain currently cut off from the river. The

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

project will extend along three quarters of a mile of the mainstem Cedar River, starting at Cedar Grove Road Bridge and proceeding downstream.

Project Benefits

Removal or set back of the levee would lower flood elevations and velocities through the reach, thereby reducing or even eliminating future maintenance costs. It would also take the pressure off the opposite bank, reducing erosion and scour along the flood protection facility protecting the trail and State Route 169. The removal of bank armor and widening of the floodplain would allow for a dynamic interaction between the river and its floodplain and establishment of a fully functional riparian buffer, which would provide natural flood attenuation and would also support habitat restoration efforts within this reach. This reconnected floodplain area will expand upon the high quality corridor conditions in the Belmondo reach downstream and the restored Cedar Grove Road reach upstream.

Coordination

This project will need to be coordinated with land managers responsible for the properties previously purchased to allow completion of this project.

Other Information or Needs

This project is also a recommendation in the Cedar River Basin Plan (King County 1997) and the salmon habitat recovery plan for Water Resource Inventory Area 8.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Rhode Levee Setback and Home Buyouts

Location Information

Water Resource Inventory Area 8, Cedar River

River Mile 13.75 to 14.05, Left Bank

Council District 9

Jurisdiction: Unincorporated King County

Public or Private lands

No Agricultural Production District or Farmland Preservation Program lands

Estimated Cost

\$3,518,000

Problem Statement

Erosion, scour, and lack of containment along the Rhode Levee allows fast and deep flows to overtop the banks and flow through the adjacent residential neighborhood and across SE 203rd Street. The flood protection facility, the homes and the roadway have all required regular repair and maintenance due to flood damages. With levees flanking both banks for approximately 1,600 linear feet, the river is severely constricted through this reach. This confinement leads to an increase in localized scour velocities and flood elevations, exacerbating flood damage and risks to the flood protection facilities as well as the surrounding residential properties. The Rhode Levee also separates the river from its floodplain and disrupts the natural floodplain processes and interactions.

What Is at Risk

Risks identified in the 2006 King County Flood Hazard Management Plan Policy G-2 that this project is intended to reduce or eliminate include:

- Risk to public safety if right bank residents are caught unaware of flood conditions or attempt to enter or reenter flooded areas;
- Risk to public safety if fire and rescue personnel are called upon to aid those unable or unwilling to evacuate flooded homes;
- Damage to public infrastructure, primarily flood protection facilities;
- Damage to privately owned structures.

Proposed Project or Action

Project designs for reducing flood damage and loss behind the Rhode Levee will need to give consideration to projects planned for the Getchman Levee on the opposite bank. The hydraulic model may need to be updated to reflect the new topographic conditions, and the results evaluated to determine the impact on flood hazards and future projects in the vicinity. Homes in the highest hazard areas should be acquired and the structures removed from the floodplain. Following acquisition of these flood-prone homes, and as part of a long-term flood hazard management strategy, channel conveyance should be expanded to safely accommodate flood flows while protecting SE 203rd Street and the remaining homes from any increased flood risk.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

This may be accomplished by setting back the levee or by constructing a conveyance channel through the floodplain.

Project Benefits

Acquiring and removing the flood-prone homes will eliminate both the flood risk for homeowners and the need to repair damage. Subsequent conveyance improvements will reduce localized flood elevations and velocities, which will reduce flood damage and the need for future repairs on both the right and left bank flood protection facilities. Construction of a levee setback would provide additional habitat benefits by allowing natural floodplain processes and interaction with the river. The project will complement work on the opposite bank to reconnect the floodplain and to improve lower Taylor Creek, creating a wide floodplain area within which the river has room to flood, to move and to create more complex channel and riparian habitat.

Coordination

This project will need to be coordinated with any modification of the Getchman Levee as well as with agencies implementing the salmon habitat recovery plan for Water Resource Inventory Area 8 and the Cedar River Basin Plan. Elements of project design that address the need to protect SE 203rd Street will need to be coordinated with the King County Department of Transportation. Elements that will directly affect individual properties will be coordinated with the property owners.

Other Information or Needs

The level of homeowner interest in participating in a voluntary buyout program has not yet been assessed.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Sammamish Bank Stabilization Project (Sammamish River)

Estimated Cost: \$2,944,000

WRIA #: 8

River Mile # to RM #: 0.0 – 14.0

Right bank, Left bank, or Both banks: Both banks

Jurisdiction(s): Sammamish River, Unincorporated, Cities of Redmond, Woodinville, Bothell, and Kenmore

Public or Private lands: public

Agriculture Production District or Farmland Preservation Program lands: Easements on some APD and FPP lands

What's At Risk: Flood protection facility extending the full length of the river

Problem Statement: The entire Sammamish River was dredged and channelized in the 1960s in order to reduce spring flooding of the agricultural lands that comprised the floodplain. This channelization followed the 1914 lowering of the water surface at its mouth in Lake Washington, which occurred as a result of construction of the Hiram Chittenden Locks. These two large-scale projects, designed and constructed by the U.S. Army Corps of Engineers, successfully reduced the extent and frequency of floodplain inundation so that flooding is largely confined within the existing channel for all but the greatest floods. However, the deepened and straightened river became isolated from its floodplain, tributary streams were disconnected at their mouths, and the complex bends and turns of the river were removed. Additionally, protocols established by the U.S. Army Corps of Engineers for channel maintenance requires that the County clear vegetation from the river's banks and remove sediment or other accumulations of debris from within the channel along its entire 14 mile length. This maintenance regimen is often in conflict with healthy ecosystem management and the goals for recovery of federal Endangered Species Act listed species, and may not be permissible given the current regulatory environment. This conflict in mandates threatens the long term maintenance of this riverwide flood control facility.

Proposed Project or Action: Explore opportunities to maintain the facility in a manner that retains native vegetation, removes non-native vegetation, and balances the need to protect riparian integrity while meeting hydraulic objectives.

Project Benefits: Stabilized shorelines, improve conveyance and floodplain capacity, enhanced riparian and floodplain habitat conditions

Coordination: U.S. Army Corps of Engineers, Cities of Redmond, Woodinville, Bothell, and Kenmore

Other Information or Needs:

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Name: Willowmoor Floodplain Restoration Project (Sammamish River)

Location Information

Water Resource Inventory Area 8, Sammamish River

River Mile 13.0 to 13.5, Left and Right Banks

Council District 3

Jurisdiction: Redmond

Public lands

No Agricultural Production District or Farmland Preservation Program lands

Estimated Cost

\$2,944,000

Problem Statement

The headwaters of the Sammamish River are in Marymoor Park, where the river is formed by the outflow from Lake Sammamish. This headwater area contains a number of sizable wetlands that hint at the rich wetland complex that once covered much of this landscape and provided natural flood storage and release. The engineered flood control functions of this river system are initiated within its first 1,400 feet, in an area called the transition zone. At the start of this reach, lake outflows spill over a low weir into a wide river cross-section. This area encompasses the steepest gradient portion of the entire river. At the downstream end of the transition zone, the river tapers to the standard cross-section that defines the remaining 13.5 miles of the river. The configuration of this transition zone is considered central in establishing the flood conveyance capability for this river system. Maintenance of the flood protection mechanism of this transition zone, as currently constructed, requires regular removal of the vegetative buffer, which is not only adversely affects water quality and habitat, but is at odds with federal, state, and local imperatives to protect these ecological elements and recover Endangered Species Act-listed species. This poses a serious challenge, and even a potential obstacle, for the long-term maintenance of the flood protection facility.

What Is at Risk

Risks identified in the *2006 King County Flood Hazard Management Plan* Policy G-2 that this project is intended to reduce or eliminate include:

- Damage to private structures caused by increased water surface elevation of lake Sammamish.

Proposed Project or Action

Reconfigure the transition zone in order to increase channel complexity, establish a native plant community and riparian buffer, and maintain adequate flow conveyance to meet flood control obligations in a sustainable manner. This will involve widening the total cross-sectional area available for flood flows so that plants can be allowed to grow within the banks and not be an obstruction to that flow. Instream complexity will be improved by both structural changes that are engineered in the design, as well as natural geomorphic changes that occur over time in response to the structural modifications.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

Project Benefits

The project will eliminate the need to cut native vegetation on the riverbanks and within the channel below the ordinary high water mark, which has become more difficult to do because of permit requirements associated with such work in and around the habitat of Endangered Species Act-listed species. It will also provide an increased degree of certainty surrounding the conveyance, which presently can vary depending on the timing of the maintenance cycle. Equally significant will be the habitat improvements that result from the creation of the new channel alignment, instream features, and establishment of streamside vegetation, all of which will work together to provide food, shade, pools, cover, and increased channel mobility and diversity for fish and wildlife. This will help reverse any environmental impact that resulted from construction of the original flood control project.

Coordination

This complex project will involve many clients and stakeholders. Any modification to the 1960s-constructed Sammamish River channel will need to be coordinated with and approved by the U.S. Army Corps of Engineers. In addition, the project is located in a major County park, and all design and construction plans will need to be coordinated with the King County Parks and Recreation Division and park users. The underlying lands are in the vicinity of known areas of archaeological significance. Any work in this area will need to be coordinated with local tribes and cultural resource offices.

Other Information or Needs

Several detailed engineering studies have been completed for this project. Development of conceptual design plans is underway. A website (<http://dnr.metrokc.gov/wlr/flood/willowmoor>) has been created to share project information as it develops and to solicit public input.

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

**King County Flood Control Zone District
Project Summary Sheet**

GENERAL INFORMATION

- 1. Project Name:**
- 2. Project Proponent (Name and Agency):**
- 3. Basin/Watershed:**
- 4. Project Type:** check all that apply. See Criteria/Policy Handout for additional project type description.
 Proposed supplement to an existing project, identified as part of the Draft KC FCZD CIP list
 Newly identified major river flood CIP, not currently on the Draft KC FCZD CIP list
 Sub-regional project proposal, not currently on the draft KC FCZD CIP list,
- 5. Total Estimated Project Cost (all phases):** \$
- 6. Proposed Local Share** (if sub-regional project). Provide other actual local share if known or proposed, if not known:
 \$ _____
 \$ 0

LOCATION INFORMATION

- 7. Downstream River Mile # to Upstream RM #:**
- 8. Right bank, Left bank, or Both banks:**
- 9. Jurisdiction(s):**
- 10. Public or Private lands:**
- 11. Agriculture Production District or Farmland Preservation Program lands: yes/no/do not know**

PROJECT INFORMATION

- 12. What's At Risk:**

- 13. Problem Statement:**

- 14. Proposed Project or Action:**

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.

**King County Flood Control Zone District
Project Summary Sheet**

15. Project Benefits:

16. Coordination Needs:

17. Other Information or Needs:

PROJECT PROPOSAL CRITERIA AND POLICY BASIS (See policy/criteria handout for expanded policy text and criteria, used to generate draft KC FCZD CIP lists)

18. Policy G-2 Flood Risks: please check all that apply, as to be addressed by the proposed project and include a brief description of the risk.

- Threats to public safety:
- Damage to public infrastructure:
- Impacts on the regional economy:
- Damage to private structures:

19. Policy PROJ-1 Prioritizing Flood Risks: please check all that apply, associated with proposed project and include a brief description of the risk.

- The consequences that will result if no action is taken. Consequences should be prioritized as identified in Policy G-2:
- Urgency, where urgency is a measure of how quickly an action needs to be taken in order to prevent a risk from growing worse:
- Legal responsibility and authority, where legal responsibility and authority is a contractual relationship between King County and another person or agency to maintain a flood protection facility:
- Funding or partnership opportunities:

20. Anticipated Project Start Date (to reflect feasibility, opportunity, and ‘ripeness’ of project proposal)

- 0-2 years
- 3-6 years
- 6+ years

21. Is the project identified within an adopted local hazard mitigation plan?

- Yes
- No

22. Do property interests need to be acquired (fee simple or easement) for this project?

- Yes
- No

23. If property interests need to be acquired, is the landowner willing to sell or sign a voluntary letter of agreement, expressing an interest in selling necessary property interests?

- Yes
- No

** This project summary sheet contains planning level information and preliminary cost estimates; final cost estimates will be developed as more detailed project level information is generated.