
EAST FORK ISSAQUAH CREEK CONFLUENCE REACH

Location:	East Fork of Issaquah Creek (tributary to Issaquah Creek), King County, WA. WRIA 8
Proposed Action:	Remove bank armoring and re-grade the bank to a flatter slope to increase connection to floodplain. Add large wood to the channel to create pool habitat and plant native riparian species on the banks to promote future wood recruitment. Excavate gravel from the confluence and redistribute upstream to encourage kokanee and Chinook spawning.
Species Benefiting:	Chinook, kokanee, coho, cutthroat



SITE BACKGROUND

The East Fork of Issaquah Creek flows from the West Tiger Mountain down to the Interstate 90 corridor and then into the City of Issaquah, where it joins the mainstem of Issaquah Creek in the City of Issaquah about 400 feet west of Rainier Boulevard N and First Avenue NW. The downstream-most portion of East Fork Issaquah Creek is bordered on the north by a parcel that was recently acquired by the City and is intended to become a new park. The south side of the East Fork Issaquah Creek is bordered by the maintenance facility for the City's Park Department. Along much of the creek's length, from the confluence upstream to I-90, the creek flows through high-density residential and urban areas. The channel is constricted, the banks are armored with rip rap, gabions, or concrete, and the coarse cobble and gravel substrate is embedded in finer sandy sediments. The heavy bank armoring is a response to the heavy flooding and erosive forces that can threaten infrastructure and private property that lie in close proximity to the creek.

At the project site, from the East Fork's crossing with Rainier Boulevard to the confluence, the channel contains many of the typical features described above. It is confined between rip rap banks, with an historic homestead (now owned by the City) on the right bank and the City of Issaquah Parks Maintenance Shop and Yard on the left bank. The alignment is straight and the bed contains large cobble, embedded in finer sands. Smaller spawning size gravels have been scoured away during high flows.

A gravel bar has aggraded at the confluence, creating a vertical disconnect between the East Fork and the mainstem during low flows. Erosion on the opposite bank of the mainstem is indicative the high hydraulic pressures associated with flood events.

The City of Issaquah replaced the Rainier Blvd bridge in 2003 and the NE Dogwood bridge in 1997. This reach is referred to as Reach 1 in the WRIA 8 Chinook Plan and restoration plans for this reach have been included in prior reports (The Watershed Company, 2006).

Kokanee/Chinook Restoration Feasibility Assessment in the Sammamish Watershed

Map J - East Fork Issaquah Creek - Confluence Restoration Project



11810 North Creek Parkway N
Bothell, WA 98011

Project 0-915-17013-0

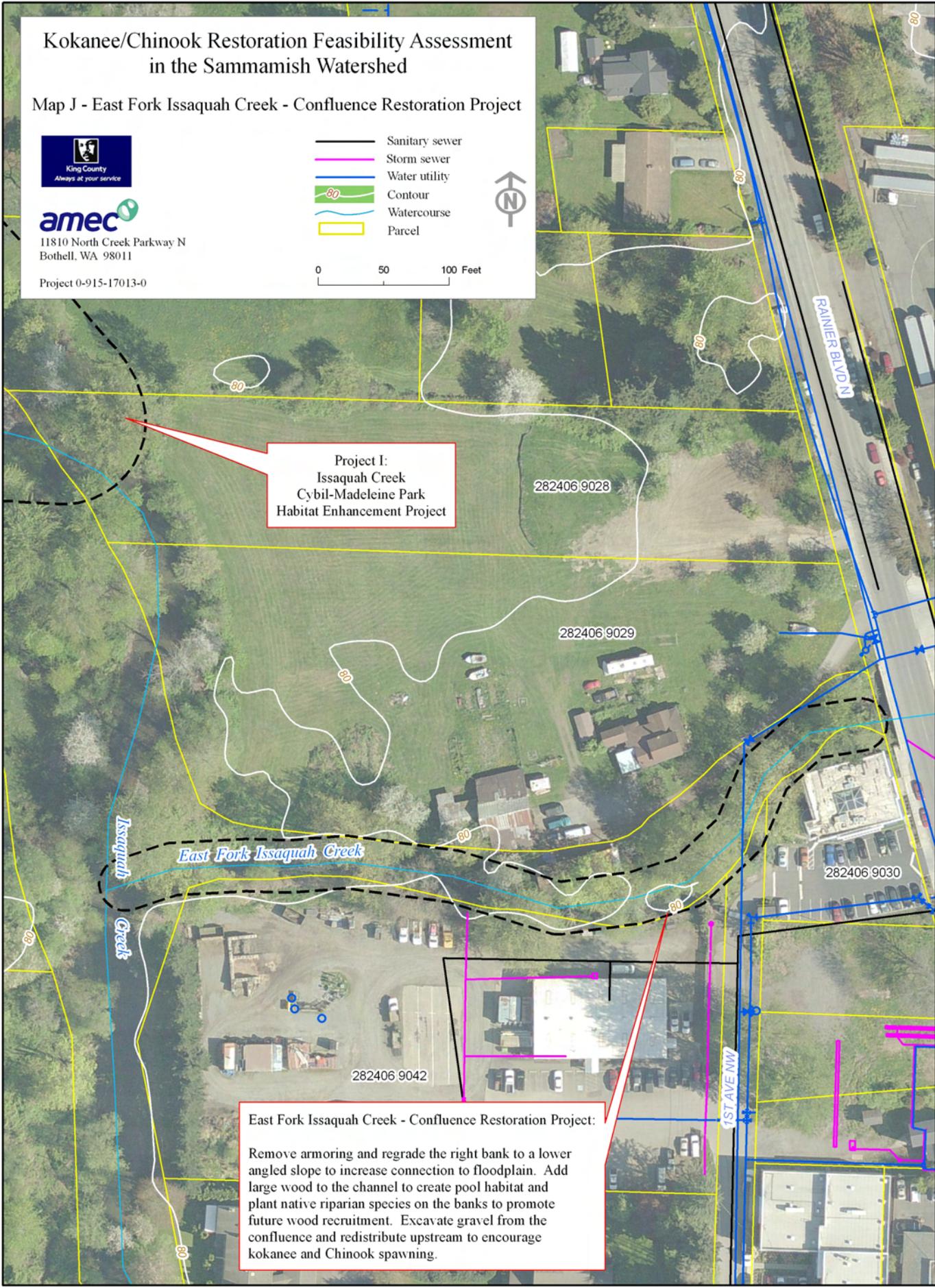
- Sanitary sewer
- Storm sewer
- Water utility
- Contour
- Watercourse
- Parcel



0 50 100 Feet

Project I:
Issaquah Creek
Cybil-Madeleine Park
Habitat Enhancement Project

East Fork Issaquah Creek - Confluence Restoration Project:
Remove armoring and regrade the right bank to a lower angled slope to increase connection to floodplain. Add large wood to the channel to create pool habitat and plant native riparian species on the banks to promote future wood recruitment. Excavate gravel from the confluence and redistribute upstream to encourage kokanee and Chinook spawning.



IMPORTANCE FOR KOKANEE AND/OR CHINOOK POPULATIONS

The East Fork of Issaquah Creek is used by both wild and straying hatchery origin Chinook salmon for spawning and rearing.

Kokanee are not known to currently use the creek, although spawner surveys have been limited in recent years. Historically, the Issaquah Creek watershed supported the early run of kokanee, but this run is now believed to be extinct. The upper reaches of this watershed still hold promise as potential kokanee restoration sites, especially if developed in conjunction with the emergency supplementation program.

Coho salmon and cutthroat trout would also benefit from efforts to restore the natural hydrology of this creek, since they rely on similar habitat characteristics.

LIMITING FACTORS

The project reach, similar to the rest of the East Fork below I-90, is highly constrained by armored banks, has no connection to the floodplain, and has very little in-channel structure or pool habitat. The stream bed consists of boulder and cobble size substrates embedded in finer sandy sediments. The aggraded gravel bar at the confluence of the East Fork and mainstem may pose a challenge to upstream migrating fish because it creates a steep, shallow riffle, especially at low flows. While the flashy nature of the creek is a result of the topography and extensive development upstream of the site, it is possible to alleviate these symptoms and create fish habitat in certain reaches.

PROPOSED ACTION

This project would achieve the following tasks:

- Reconnect the floodplain along the reach by removing armoring and softening the bank to a lower slope angle.
- Install pool forming and roughness elements that will reduce the hydraulic forces during storm events and increase the capacity to retain spawning gravels, thereby improving habitat within the reach and improving access to the reach by limiting the supply of coarse sediments that feed the gravel bar at the mouth of the creek.
- Remove non-native invasive species along the banks, and re-plant with native riparian species that will promote the recruitment of wood into the stream.
- Remove excess gravel from the bar to create a defined low flow channel and pool at the confluence.

- Redistribute the smaller gravels upstream, where appropriate hydraulic conditions exist, to enhance spawning of Chinook, kokanee and other salmonids.
- Install large wood at the confluence and on the opposite bank of the mainstem to maintain the bank structure and reduce erosion.

In the WRIA 8 Proposed Lake Washington/Cedar/Sammish Watershed Chinook Salmon Conservation Plan, the left bank of the East Fork Issaquah Creek was proposed to be naturalized. The property is used as the City's Parks Department maintenance facility, which would be relocated to facilitate this work. Within this alternative, additional nearby sites were suggested to be included, calling it a "Confluence Park."

EXPECTED BENEFITS

This project will achieve the following benefits:

- Improve access to the East Fork for upstream migrating salmonids, particularly during low flows;
- Protect the mainstem bank opposite from the confluence from erosion and undercutting;
- Reduce stream flashiness and increase retention of spawning gravel in the project reach;
- Create diverse instream microhabitat types that include pools, juvenile salmonid rearing habitat and adult spawning areas; and
- Restore a functioning riparian zone that supplies wood to the stream.

SELECTION CRITERIA SCORING MATRIX RESULTS

Category	Basic Question	Scoring Question	Score	Justification
Location	In which stream and reach is the project located? What is the historical and current significance for kokanee and/or Chinook?	What is the historical and current significance of the site for kokanee ?	6	Used historically by the early-run of kokanee
		What is the historical and current significance of the site for Chinook ?	10	EF is tributary to the primary Chinook stream in the Sammamish Basin
Limiting Factors	Would the project address specific limiting factors?	How well does the project address factors limiting kokanee ?	7	Project would help ensure passage/access, stability of banks and better substrate composition
		How well does the project address factors limiting Chinook ?	7	Project would help ensure passage/access, stability of banks and better substrate composition
Watershed Context and Condition	Is project success dependent on conditions elsewhere in the watershed?	Do surrounding land uses and/or management strategies lead to constraints (or opportunities) for the proposed restoration? Examples: water quality, sediment, flow regime, fish access, riparian vegetation	5	Located within urban setting. Other intensive land uses and flashy flows from runoff may constrain success
		Who owns project area and is long-term protection ensured?	9	City owned park
		Who owns neighboring parcels? What land uses occur upstream and/or downstream that could be affected by restoration? What risks do those uses pose to the site now and in the future?	4	Business park and City Parks maintenance yard on opposite bank
Costs	How expensive will proposed action be? What is the likelihood for funding?	What is the order of magnitude cost estimate?	8	Rough estimate: \$100K
		Are matching funds available?	5	Likely but none identified at this time
		Are specific grants or appropriations in mind that would be likely to fund this type of project?	8	Good link to Chinook funding
Socio-Political	What other considerations will determine feasibility of implementation?	Does the project have public support and/or support from the local jurisdiction?	10	Area was recognized in WRIA 8 Chinook plan, City restoration plan and by KC bio for kokanee
		Does the project have landowner support?	8	City is generally supportive, but specific actions not yet discussed
		Does the project utilize or create public access?	10	New city park - high profile



Existing conditions in East Fork Issaquah Creek downstream of Rainier Boulevard, City of Issaquah, WA



Proposed bank softening and large wood installation along the right bank of East Fork Issaquah Creek