

Restored Bear Creek Looking Downstream (westward)



Restored Bear Creek Looking Upstream (eastward)



Backwater Channel



The Oldest Known Archaeological Cultural Resource Site in Western Washington



Bank Stabilization with Large, Woody Debris to Protect Cultural Resource Area

# Bear Creek Rehabilitation



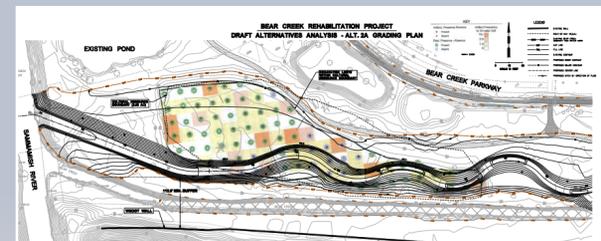
Bear Creek, a tributary to the Sammamish River, was straightened and hardened (with riprap) by the US Army Corps of Engineers (USACE) in 1965 as part of the Sammamish River flood control project. Nearly a mile of the lower reach of stream was identified as a high-priority restoration project, as it is a critical migration route for diminishing wild salmon stocks from the Lake Washington system.

David Evans and Associates, Inc. (DEA) provided stream rehabilitation design and permitting to provide a more naturally functioning stream system in the lower 3,246 feet of Bear Creek—ultimately, restoring critical salmon habitat and supporting the recovery of the North Lake Sammamish population of Chinook salmon. This complex urban stream restoration project addressed multiple objectives:

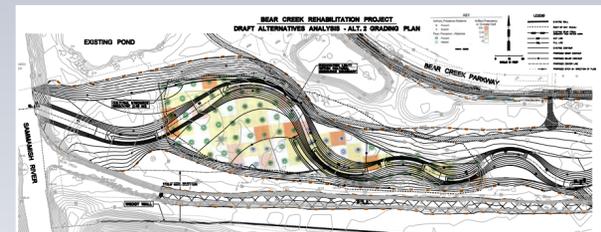
- Realigned the lower 3,246 feet of Bear Creek to a more natural channel morphology to confluence with the Sammamish River
- Hydraulically re-connected Bear Creek with its floodplain and created 0.9 acres of riparian wetlands
- Re-purposed old remnant channel as “backwaters” to provide high flow refuge habitat critical to juvenile salmonids (increasing in-stream habitat by approximately 1,335 feet!)
- Installed 1,500 pieces of large, woody debris for bank protection and pool formation
- Excavated floodplain storage volume for compliance with the Federal Emergency Management Agency (FEMA) “zero rise” and USACE 1965 Sammamish River Flood Control project hydraulic criteria for lower Bear Creek
- Realigned 3,000 feet of regional trail away from the stream with key pedestrian overlooks
- Preserved on-site cultural resources and integrated archaeology fieldwork into construction, scheduling, and staging

This project was complicated by the discovery of the oldest known archaeological site in western Washington making it one of the first archaeologically excavated sites from this region that dates back to the end of the Ice Age! This discovery required innovative engineering solutions to mitigate impacts to cultural resources in order to successfully permit and construct the stream rehabilitation. To overcome this challenge, DEA:

- » Worked side-by-side with the City of Redmond, the Washington State Department of Transportation, Native American tribes, and the USACE to realign the stream, thereby minimizing cultural resource impacts
- » Designed an elevated floodplain in order to preserve the archaeological stratum containing the highest artifact densities
- » Phased the work into three separate construction packages over three years to accommodate cultural resources, while continuing to move forward with the design to meet funding and permit requirements for completion by 2014



Revised Alignment to Minimize Impacts to Cultural Resources



Original Alignment



DAVID EVANS AND ASSOCIATES INC.

Client: City of Redmond  
Location: Redmond, Washington