River Restoration

*Dike Removal*

*East Fork Lewis River*

Karen Streeter, PWS
Clark County Public Works
Clark County, WA

Clark County, Washington

[Map showing the project location on the East Fork Lewis River (undammed system) and surrounding areas, including Columbia River, Merwin Reservoir, and Yale Lake.]
1966: Dike Constructed by CCPW to allow instream gravel mining for public works projects

1972: Major flood event resulting in channel avulsion

1996: Major flood event resulting in channel avulsion, channel moved 800 feet to the south endangering homes that were built adjacent to historic channel zones, but at the time were outside of restricted riparian zones (lesson learned….)

2004: Project support for removal of dike by citizens, non-profit groups and agencies

2005: Dike removed by CCPW Maintenance and Operations
Physical Characteristics

- **Length:** 264 feet
- **Width:** 76 to 160 feet
- **Average Height:** ~9.5 feet
- **Volume of Material:** ~7000 cubic yards
- **Material:** Large Boulders (imported), Riverbed Cobble, Sand and Soil
Historic Aerial Photos

Clark County GIS has excellent aerial photo record (from 1955 to present)
USGS 14222500 EAST FORK LEWIS RIVER NEAR HEISSON, WA

DAILY MEAN STREAMFLOW, IN CUBIC FT PER SEC

15000 CFS, Jan. 1972
21000 CFS, Feb. 1996

EXPLANATION

- DAILY MEAN STREAMFLOW
- ESTIMATED STREAMFLOW
Reach-scale photos

Documents Channel Avulsions pre- and post- dike construction in 1966

Channel avulsion through pond, abandoned main channel to north.
Channel migrating further south

Channel has continued to migrate south and now threatens homes built on cliff edge, note that when homes were built, they were 800 feet from channel.

Permitting

- Permitting was easy!
  - fit into exemptions for many permits
  - Early field meetings allowed agency input and support
  - Limited duration of work = Limited fisheries risk
  - Good oversight during construction with biologist on-site

- Exemptions Allowed:
  - Corps of Engineers (no in-water work, clean excavation only)
  - Washington Dept. of Ecology Shorelines Permit
  - Clark County Habitat Permit
  - Clark County Floodplain Permit
  - SEPA

- Permits Issued:
  - Washington Fish and Wildlife Fish Enhancement Permit
Project Details

- **Total Time to Deconstruct**
  - 14 days
  - Summer, 2005

- **Total Material Excavated**
  - 7000 cubic yards
    - Excavators (1)
    - Bulldozer (1)
    - Dump Trucks (4)

- **Total Cost:**
  - Estimated: $50,000
  - Actual: $32,000

Construction Methods
Excavating from end of dike; side access haul out

Excavate 2nd half of dike
Dump trucks using excavated haul road
(made for quick and easy truck loading)
Continue excavating to match surrounding Ground elevation

Example of boulder removed from exterior face of dike
Plan assumed entire dike made of this size material
(However, only exterior facing actually was large rock)
Utilize bulldozer claw to loosen compacted ground
(allow easy movement of streambed material by river channel)
Make sure to break the rental equipment

Excavated dike area down to match adjacent grade
Cobble loosened with dozer to alleviate compaction
CCPW scattered woody material generated from the project (trees and native brush that was growing on the dike) within the excavation area.

River utilizing excavated area for floodplain during December 2005 flood event.
Thanks to the following people who helped make this project happen:

Heath Henderson, PE, Clark County
Clark County Maintenance and Operations Crew
Washington Department of Fish and Wildlife
Clark County Community Development
FishFirst (Dick Dyrland)
Bruce Wiseman

Questions?
Karen.streeter@clark.wa.gov
www.co.clark.wa.us