Challenges and Successes of Implementing a Multi-Objective Flood Control Project on Antelope Creek

September 6, 2017

Placer County Flood Control and Water Conservation District
Antelope Creek Flood Control Project, Upper Weir

Otherwise Known As: “The Most Expensive and Time Consuming Culvert Replacement Project Known to Mankind”

5 years and 4 million dollars!
Project Location
Project Background

• Regional Flood Mitigation Solution
• 100-yr Peak Flow Reduction Up to 760 cfs
• Multi-Objective Components
• Partners/Stakeholders – 4 Local Member Agencies, RWA, DWR, Maya Archers Club
• Funding – Two DWR Grants 1.1 million, watershed mitigation fee program 1.5 million, member agency loans 1.3 million
• Planned 2 Year schedule from Design to Construction
  2012-2014 grew to 5 Year 2012-2017
Antelope Creek Flood Control Project Overview

- Closed Landfill #1
- Closed Landfill #2
- Culvert Crossing to be Replaced
- Antelope Creek
- Open Space Trail
Project Features/Considerations

- Culvert/Weir
- Fish Passage and Habitat Improvements
- Oak Plantings
- Riparian Plantings
- Bike Trail
- Interpretive Signage
- Other Considerations:
  - Utilities
  - Landfill
  - Maya Bow Hunters Archery Club
Active Archery Range and Plenty of Power Nearby
Upper Weir Aerial

- 72” Culvert
- 48” Culvert
- Bike Path
Existing Conditions - Upstream

September 27, 2012. Low flow conditions

72” Culvert

48” Culvert (not flowing)
Looking at Downstream end of Culverts

September 27, 2012. Low flow conditions

48” Culvert (not flowing)

72” Culvert
Existing Conditions - Downstream

Dec. 2014 flow after small storm event (approx. 1-yr storm event)

Water surface drop at outlet of main 72” culvert. Notice “waterline” inside.
Upper Weir Site Plan

Proposed 20-foot wide Culvert
(Approximate creek width)
Culvert – Low Flow

- Weir
- Proposed Culvert
- Existing Embankment
- Plunge Pool
- Rock Weir

- Normal Low Flow
Culvert – High Flow

100-Year Storm

Weir

Proposed Culvert

Existing Embankment
Culvert

Normal Low Flow – Proposed Conditions

View Looking Upstream
Culvert

~ 10-Year Storm Event

View Looking Upstream
Culvert

100-Year Storm Event

View Looking Upstream
# Environmental Permits and Approvals

## Federal

| United States Army Corps of Engineers | • Clean Water Act, Section 404 Nationwide Permits #3 and #27 for filling or dredging Waters of the United States; Later modified to Minor Letter of Permission  
| | • U.S. Fish and Wildlife Service and National Marine Fisheries Service - Federal Endangered Species Act, Section 7 compliance  
| | • State Historic Preservation Officer - National Historic Preservation Act, Section 106 compliance |

## State

| California Department of Fish and Wildlife | Section 1602 of the California Department of Fish and Game Code - Streambed Alteration Agreement |
| Central Valley Regional Water Quality Control Board | • Clean Water Act, Section 401 - Water Quality Certification  
| | • Waste Discharge Requirement No. R5-2004-0104 Amendment for the City of Roseville Landfill  
| | • National Pollutant Discharge Elimination System (NPDES) - General Construction Stormwater Permit |

## Local

| City of Roseville | • Flood Encroachment Permit with review by Central Valley Flood Protection Board  
| | • Tree Permit |
Project Challenges

- Flood Easement Acquisitions
- Large Funding Shortfall – 1.3 Million
- Design and Permitting Costs 44% of Construction Cost
- Threatened and Endangered Species
- Long Permit Processing Times
- Limited In-Channel Construction Window
- Directly Adjacent Closed Landfills
- Active Archery Range On-Site
- Winter Storms of 2017 Wash Out Site 2 months Prior to Bid
Keys to Success

- **Flood Easement Acquisitions** – early outreach and education key to cooperative private and public property owners; when all else fails evaluate project design changes; anticipate that public property owners (even member agencies) may require appraisals and payment

Flood easements tend to be inexpensive, approx. ½ the value of fee title!

- **Funding Shortfalls** – seek multiple grant funding opportunities; pursue advance payment loans from benefiting agencies; request DWR grant extensions well in advance; plan for expensive design costs well above 25%
Keys to Success

• **Permit Processing** – plan on the effects of USACE/NMFS under-staffing, competing larger projects and frequent staff turnover; document all processing agreements made; utilize political contacts and elevate concerns as necessary; document Endangered Species Act (ESA) compliance as early as possible otherwise CLOMR approval will be delayed.

Fully expended WRDA budget yet 404 permit took 3 years to process and 150 day maximum consult period was exceeded!

• **Limited Construction Window** – out of channel by October 15th; create incentives for contractor to expedite their work through liquidated damage clause, require frequent, detailed schedule submittals and plan for/allow weekend work.
When all else fails, write your congresspersons, it actually works:

CC: File
Congressman Tom McClintock
Senator Dianne Feinstein
Senator Barbara Boxer
Supervisor Robert Weygandt
Nancy Haley, USACE
Kaitlyn Pascus, USACE
Robert Chase, USACE
Howard Brown, NMFS
Jonathan Schram, NMFS
Brian Keating, District Manager
Elise Nelson, District Counsel
Jelica Arsenijevic, HDR Engineering
Richard Dirks, HDR Engineering
District TAC Members
Un-timely Site Washout

Jan/Feb 2017 Flood Damages Following Approx 25 yr Event
On-Going Construction Photos

Exposed Landfill Waste

Creek Bypass System Install

Existing Culvert Demolition
On-Going Construction Photos

Creek Bypass System Install

Cast In Place Concrete Culvert Forming
On-Going Construction Photos
Interpretive Signage

Antelope Creek Flood Control Project, Upper Weir
At-A-Glance

Project Description
The Antelope Creek Flood Control Project, Upper Weir is a regional flood risk reduction project within the Dry Creek Watershed area of the American River Basin. The large concrete culvert/ weir structure before the weir is designed to slow down the flow of Antelope Creek during a major flooding event, improve fish passage and significantly mitigate the impacts of urban runoff to our creeks. Additionally, public access to an existing recreational corridor has been improved to meet the Americans with Disabilities Act requirements.

Environmental Benefits
This project includes fish passage and habitat improvements for salmon and steelhead trout, such as a downstream rock weir, plunge pool and a fish-friendly culvert bottom. Additionally, invasive plant species have been removed and replaced with native plant and tree species.

Project Goals
- Provide regional flood control benefits to critically-impacted areas of western Placer County
- Improve public access to an existing recreational corridor
- Improve habitat and fish passage for special status species
- Restore native vegetation to creek corridor
- Create a stable, modified creek channel bottom

Project Sponsors:
Including the City of Roseville, City of Rocklin, Town of Loomis and Placer County

How does it work?

Normal Low Flow Conditions

100-Year Storm Event Conditions