

# CREST

A topographic map of the Columbia River Estuary region, showing the river's path through a mountainous landscape. The map is rendered in shades of tan and brown, with blue lines indicating the river and its tributaries. The terrain is characterized by numerous ridges and valleys, suggesting a rugged environment. The river flows from the upper right towards the lower left, eventually emptying into a large estuary area.

## **Application of Effectiveness Monitoring to Habitat Restoration Projects in the Columbia River Estuary**

**May 16, 2012**

**Matt Van Ess, Habitat Restoration Program Manager  
April Silva, Lead Ecologist**

**Columbia River Estuary Study Taskforce**

*Application of Effectiveness Monitoring to Habitat Restoration Projects in the Columbia River Estuary*

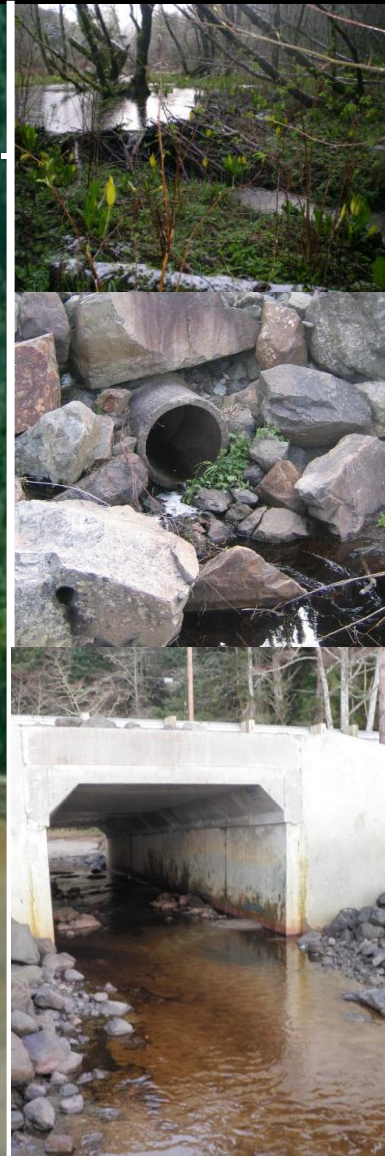
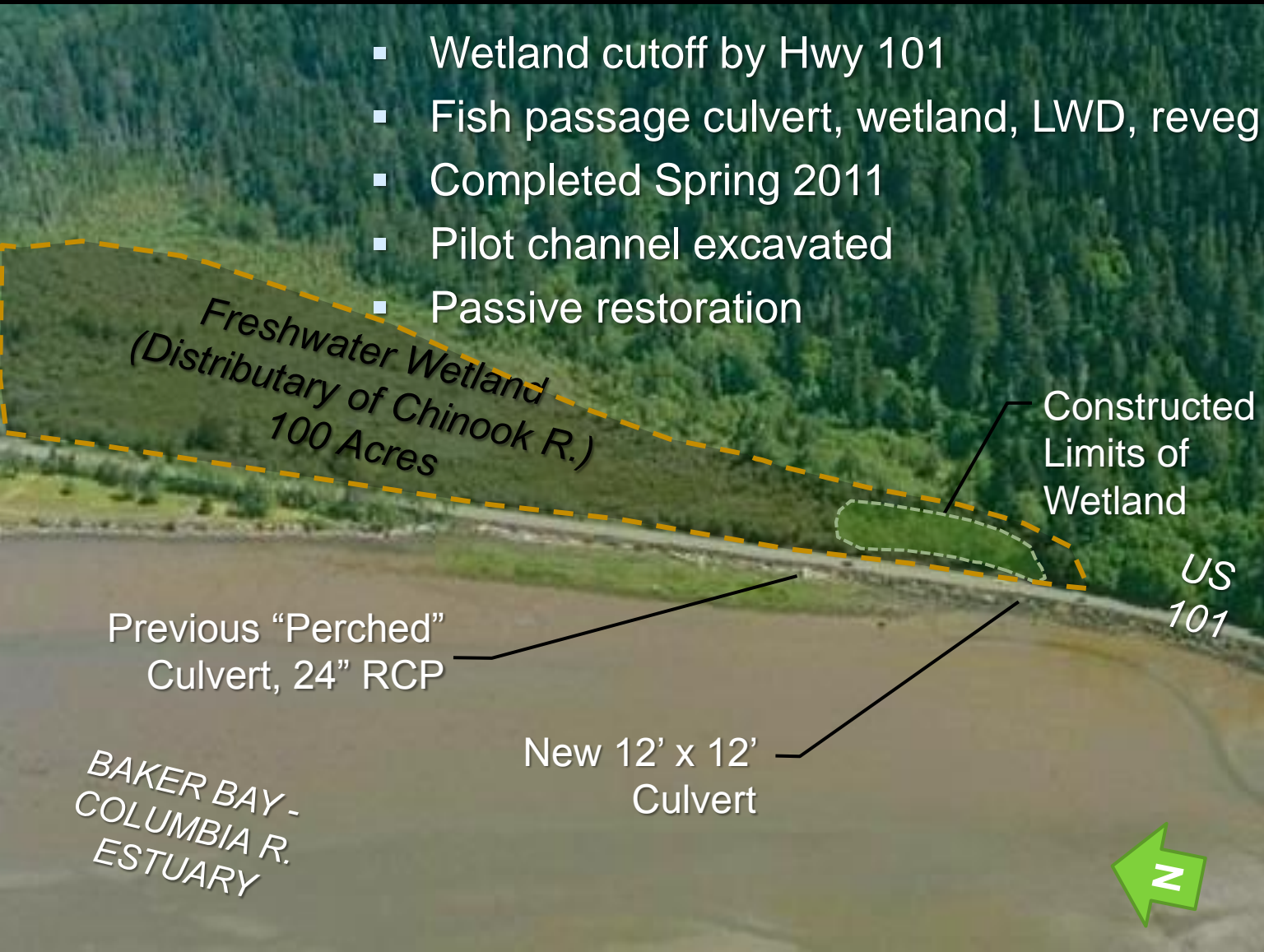
- ✓ CREST Effectiveness Monitoring and how it assists in evaluating, planning, and designing restoration projects.
- ✓ Compare landscape change and fish community information at Fort Columbia and Fort Clatsop restoration sites.
- ✓ Discuss effectiveness of passive vs. active restoration approaches at Fort Columbia and Fort Clatsop.

# CREST 2012-2013 Restoration Project Locations

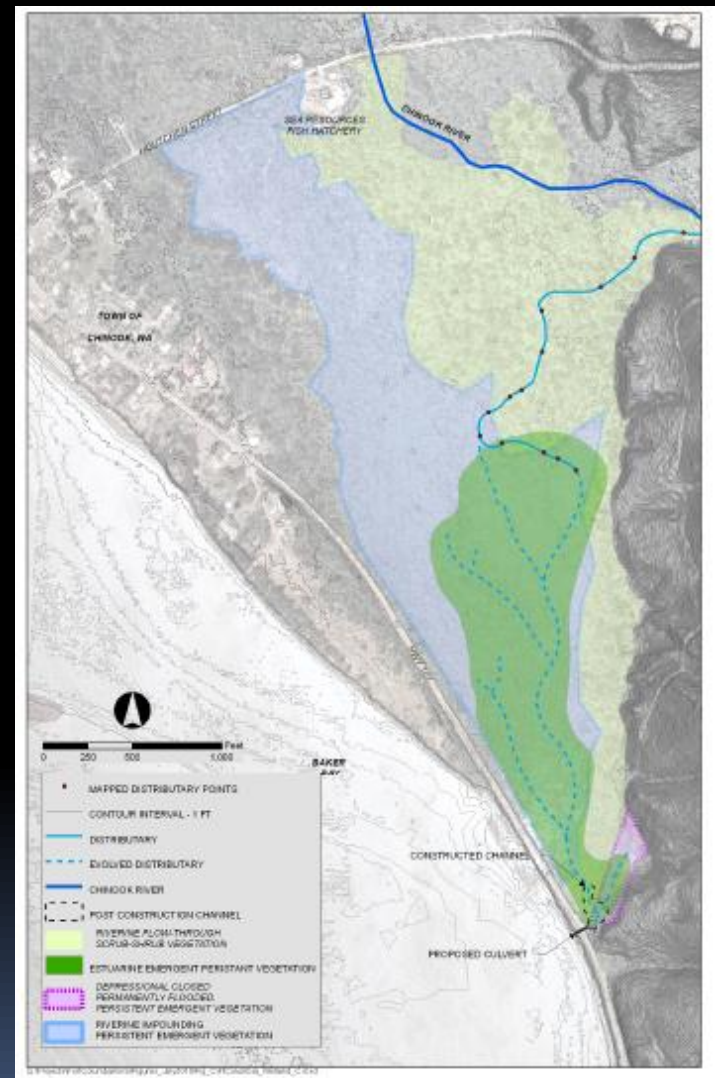
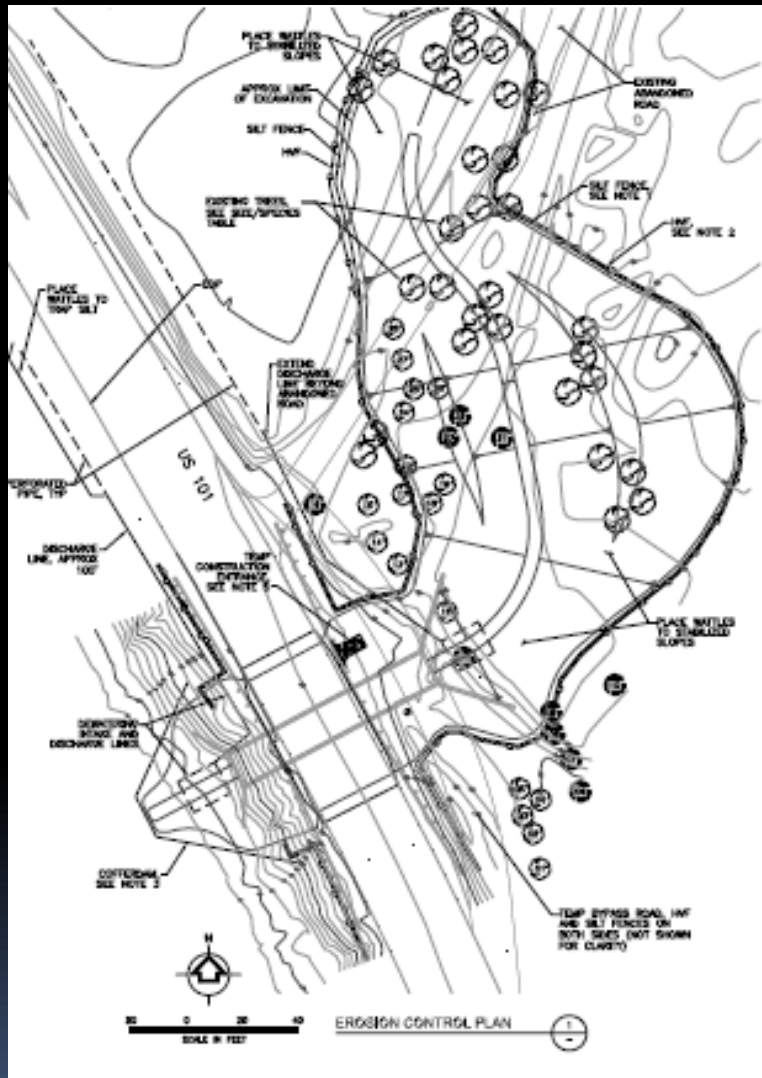


# Fort Columbia Tidal Reconnection

- Wetland cutoff by Hwy 101
- Fish passage culvert, wetland, LWD, revegetation
- Completed Spring 2011
- Pilot channel excavated
- Passive restoration



# Fort Columbia Passive Restoration Design



# Fort Columbia



# Fort Columbia Effectiveness Monitoring

A photograph of a riverbank with a white mesh trap net and orange buoys in the water, surrounded by trees and driftwood.

## Monitoring Metrics include:

### Fish Community

Trap net, Beach seine

Genetic samples

### Water Quality

Continuous data logging

### Elevation/Landscape Changes

Channel cross sections

Photo points

Sediment accretion stakes

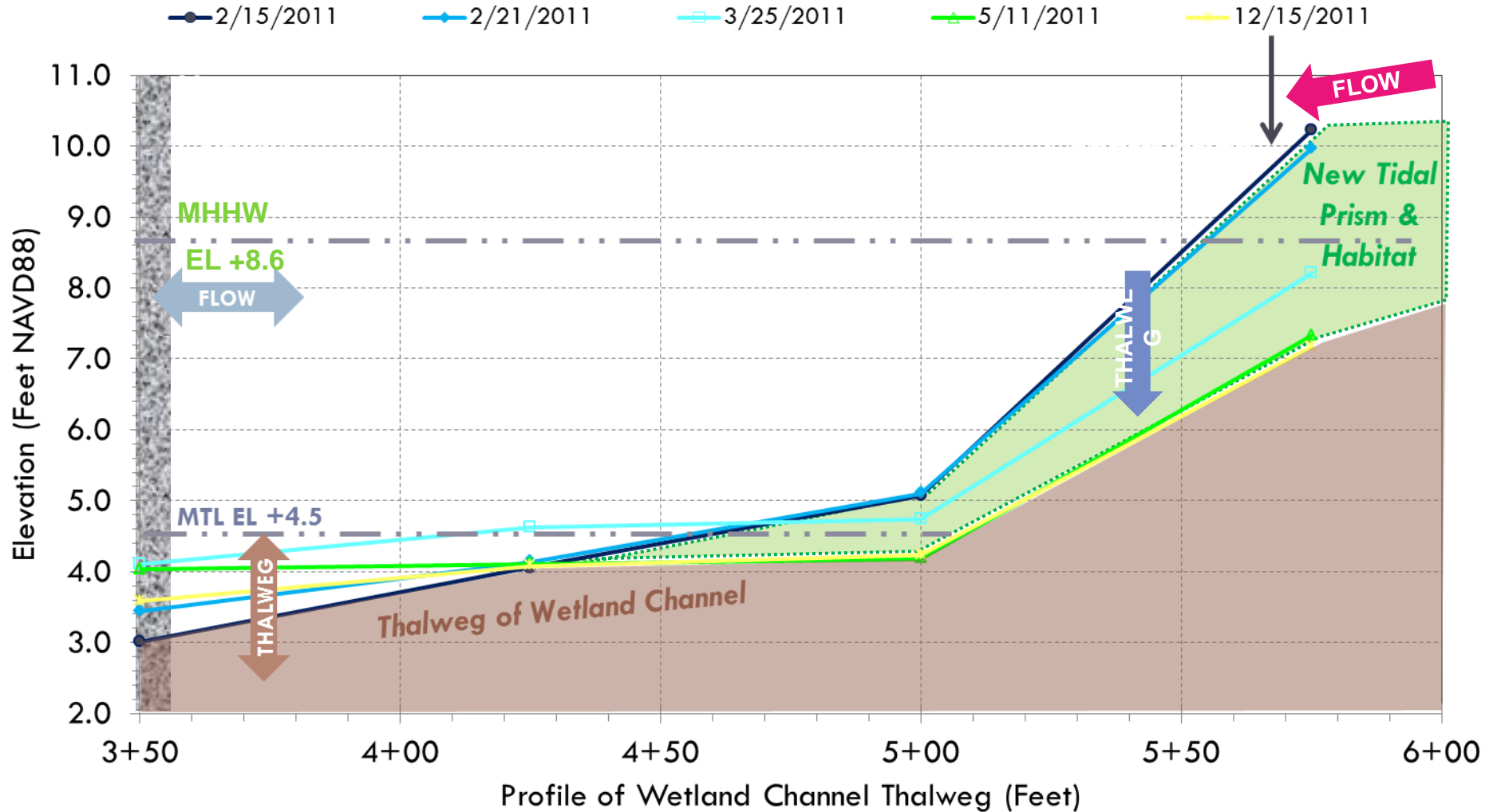
Water level measurements

### Plant species composition & cover

Vegetation transects

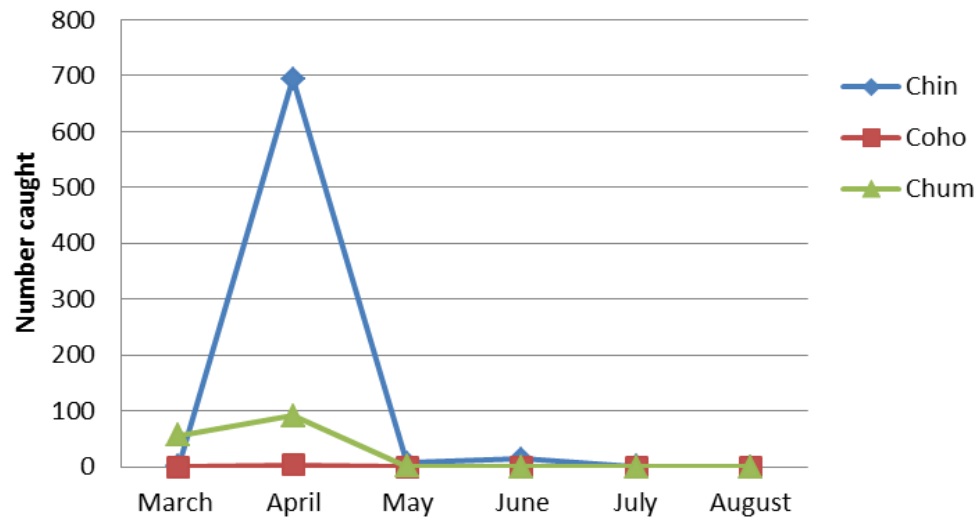
Vegetation plots

# Channel Profile Adjustment

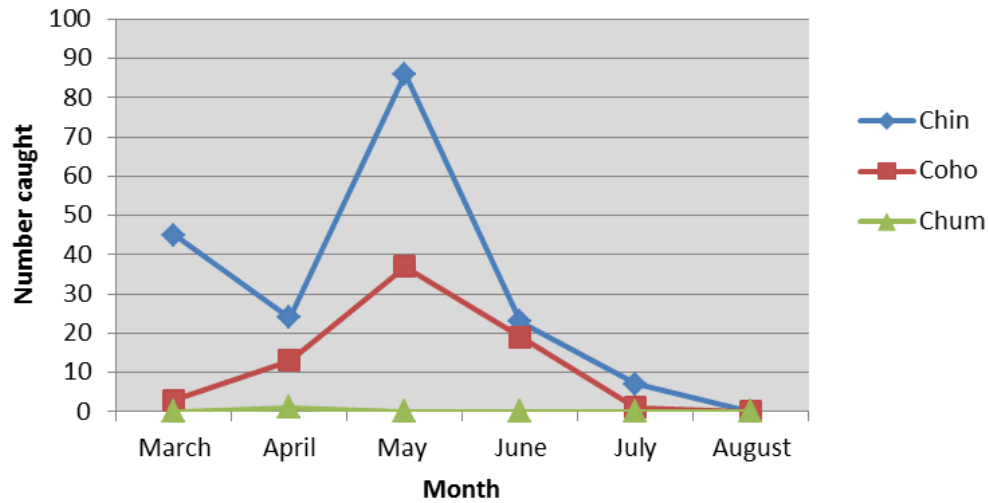




### Ft. Columbia Outside Culvert (BS) 2011



### Ft. Columbia Inside Culvert (TN) 2011



# Fort Clatsop



2006

✓ 45 acre Wetland cut off by tidegate installation through Ft Clatsop Road.

✓ Tidegate removed. bridge installed in 2007.



2007

✓ Vegetation response in northern portion.

✓ Degraded wetland vegetation persists and no channel formation on southern area.

# Fort Clatsop Effectiveness Monitoring

A landscape photograph showing a wide river or stream. In the foreground, there is a grassy bank with some mud. The water is calm and reflects the overcast sky. On the left side, several large, leafless trees stand in the water. In the background, there is a dense forest of evergreen trees under a grey, cloudy sky.

## Monitoring Metrics include:

### Fish Community

Trap net

Genetic samples

Prey availability

Prey utilization

### Water Quality

Continuous data logging

### Elevation/Landscape Changes

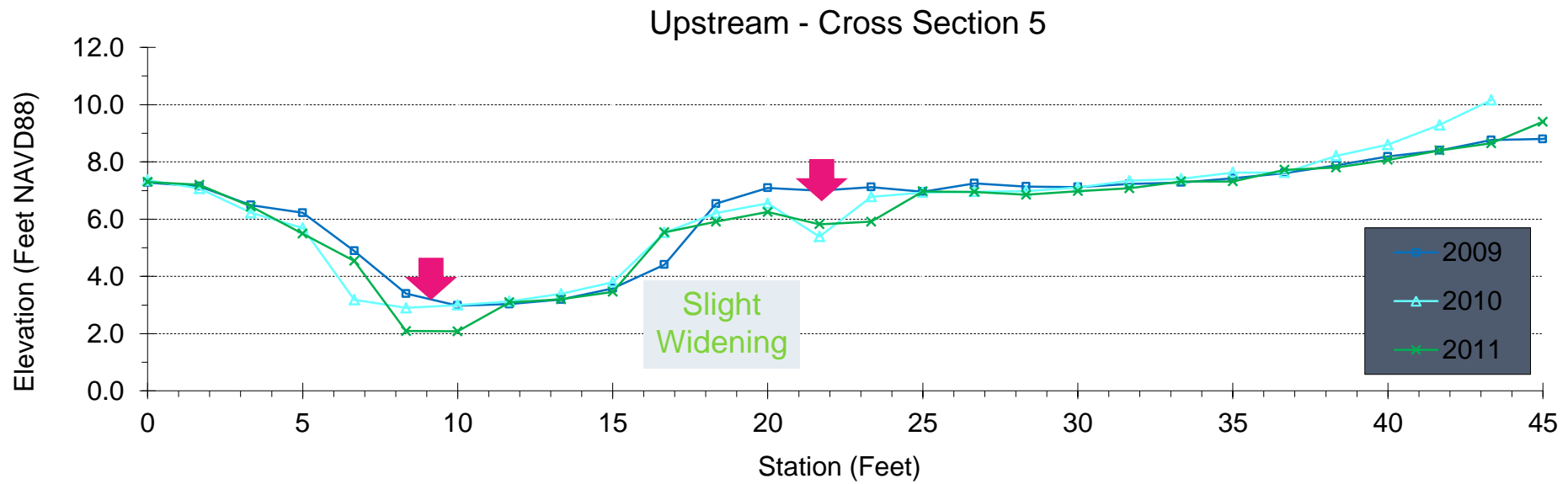
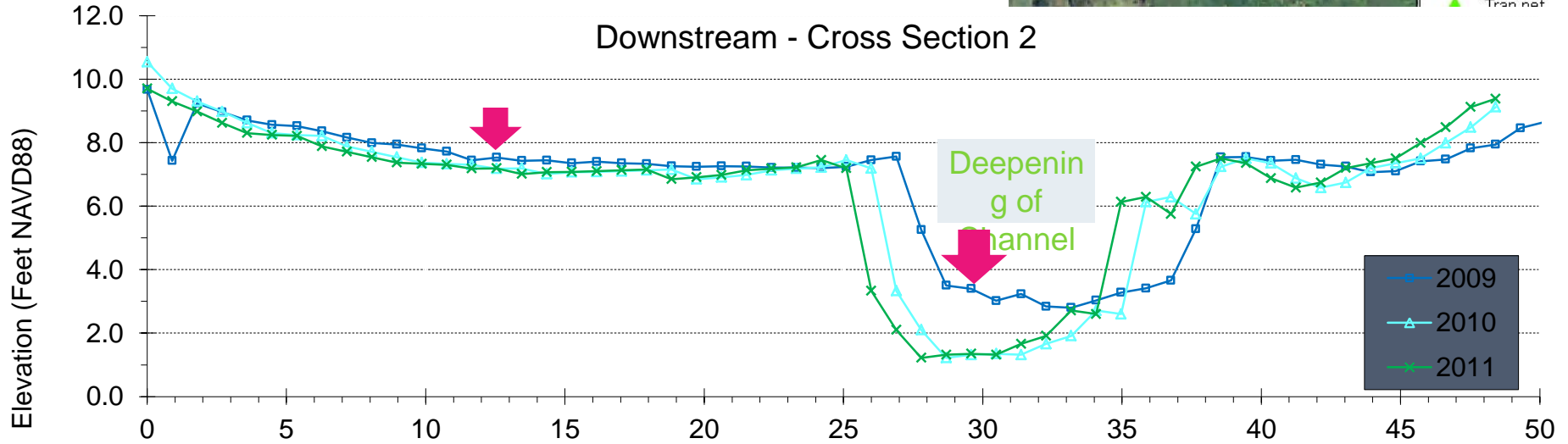
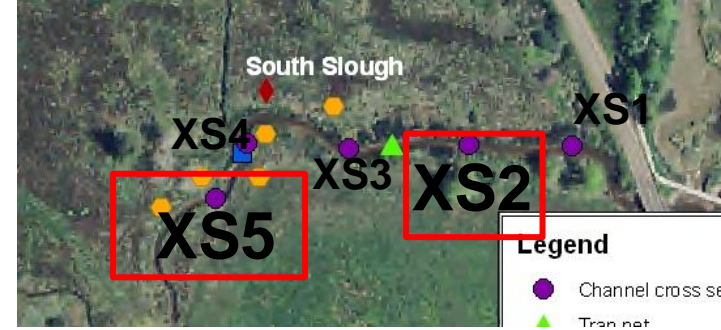
Channel cross sections

Photo points

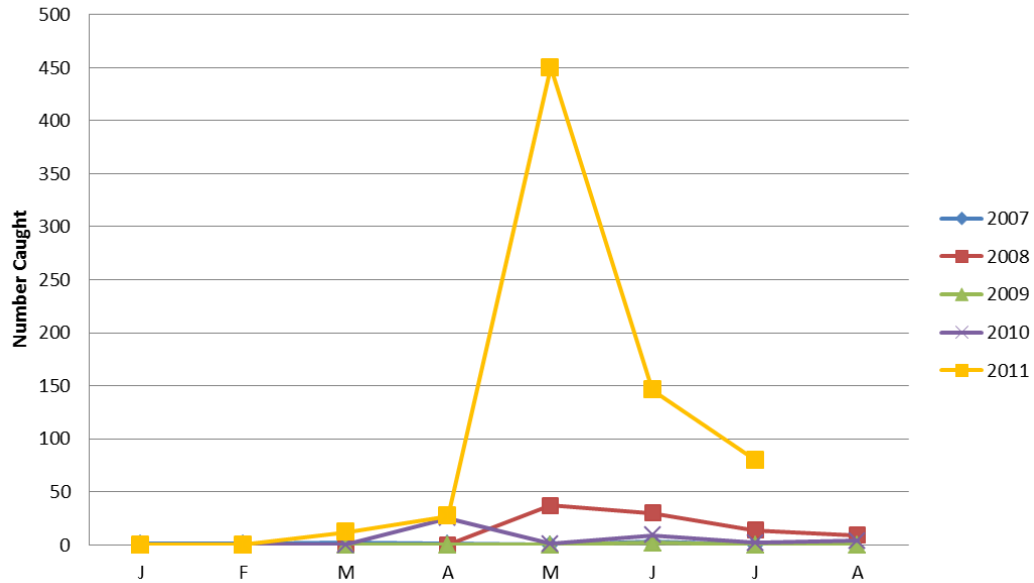
Sediment accretion stakes

Water level measurements

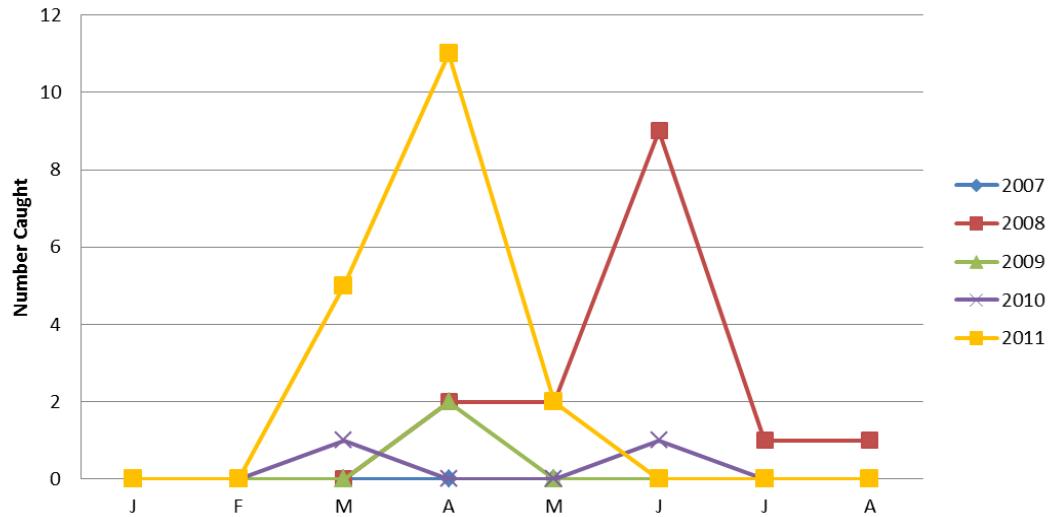
# Slough Morphology



### Coho at South Slough



### Chinook at South Slough

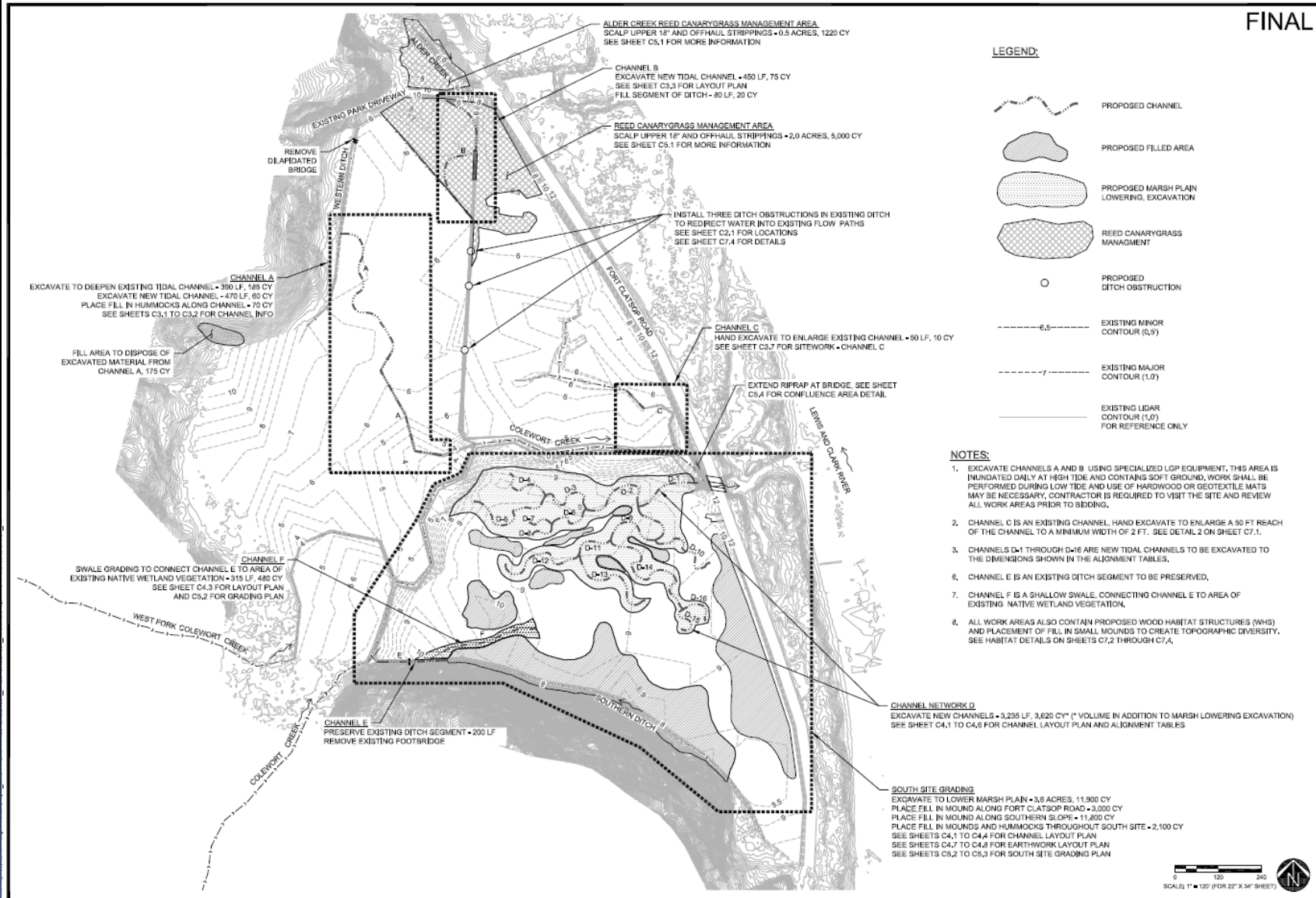


# Colewort Creek Restoration

✓ Marsh plain lowering

✓ 1 mile of channel excavation and enhancement.

FINAL



**LEGEND:**

- PROPOSED CHANNEL
- PROPOSED FILLED AREA
- PROPOSED MARSH PLAIN LOWERING, EXCAVATION
- REED CANARYGRASS MANAGEMENT
- PROPOSED DITCH OBSTRUCTION
- EXISTING MINOR CONTOUR (6.5)
- EXISTING MAJOR CONTOUR (7.0)
- EXISTING LIDAR CONTOUR (1.0) FOR REFERENCE ONLY

**NOTES:**

1. EXCAVATE CHANNELS A AND B USING SPECIALIZED LGP EQUIPMENT. THIS AREA IS INUNDATED DAILY AT HIGH TIDE AND CONTAINS SOFT GROUND. WORK SHALL BE PERFORMED DURING LOW TIDE AND USE OF HARDWOOD OR GEOTEXTILE MATS MAY BE NECESSARY. CONTRACTOR IS REQUIRED TO VISIT THE SITE AND REVIEW ALL WORK AREAS PRIOR TO BIDDING.
2. CHANNEL C IS AN EXISTING CHANNEL. HAND EXCAVATE TO ENLARGE A 50 FT REACH OF THE CHANNEL TO A MINIMUM WIDTH OF 2 FT. SEE DETAIL 2 ON SHEET C7.1.
3. CHANNELS D-1 THROUGH D-6 ARE NEW TIDAL CHANNELS TO BE EXCAVATED TO THE DIMENSIONS SHOWN IN THE ALIGNMENT TABLES.
4. CHANNEL E IS AN EXISTING DITCH SEGMENT TO BE PRESERVED.
5. CHANNEL F IS A SHALLOW SWALE, CONNECTING CHANNEL E TO AREA OF EXISTING NATIVE WETLAND VEGETATION.
6. ALL WORK AREAS ALSO CONTAIN PROPOSED WOOD HABITAT STRUCTURES (HWS) AND PLACEMENT OF FILL IN SMALL MOUNDS TO CREATE TOPOGRAPHIC DIVERSITY. SEE HABITAT DETAILS ON SHEETS C7.2 THROUGH C7.4.

**CHANNEL NETWORK D**  
EXCAVATE NEW CHANNELS - 3,235 LF, 3,620 CY\* (\* VOLUME IN ADDITION TO MARSH LOWERING EXCAVATION)  
SEE SHEET C4.1 TO C4.6 FOR CHANNEL LAYOUT PLAN AND ALIGNMENT TABLES

**SOUTH SITE GRADING**  
EXCAVATE TO LOWER MARSH PLAIN - 3.6 ACRES, 11,900 CY  
PLACE FILL IN MOUND ALONG FORT CLATSOP ROAD - 3,000 CY  
PLACE FILL IN MOUND ALONG SOUTHERN SLOPE - 11,800 CY  
PLACE FILL IN MOUNDS AND HUMMOCKS THROUGHOUT SOUTH SITE - 2,100 CY  
SEE SHEETS C4.7 TO C4.9 FOR CHANNEL LAYOUT PLAN  
SEE SHEETS C4.7 TO C4.9 FOR EARTHWORK LAYOUT PLAN  
SEE SHEETS C5.2 TO C5.3 FOR SOUTH SITE GRADING PLAN

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EG-00000000000000000000000000000000

**REGISTERED PROFESSIONAL ENGINEER**  
OREGON  
WALTER L. BROWN  
EXPIRES DATE 08-31-2011

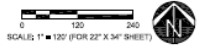
**CRESTA**  
Columbia River Estuary Study Institute  
COLEWORT CREEK TIDAL WETLAND RESTORATION PROJECT

**REVISION NUMBER**

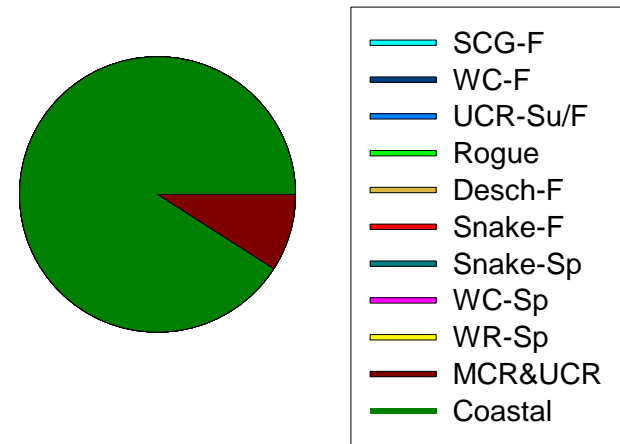
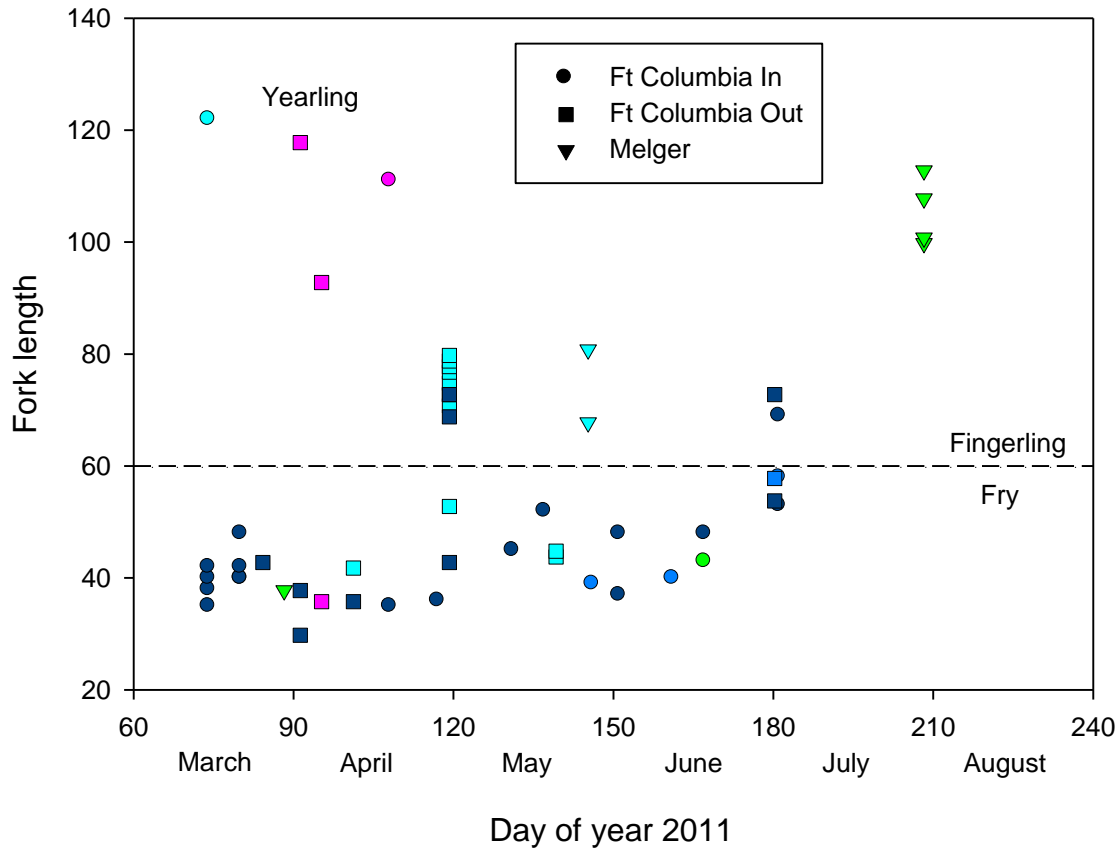
No.	Date	Revised

Sheet No. **SITE PLAN & OVERVIEW**

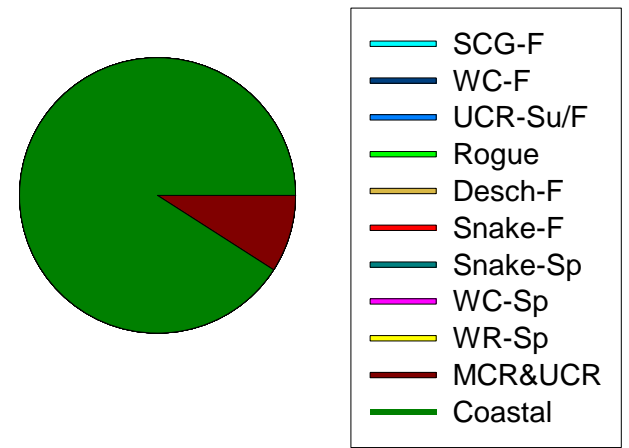
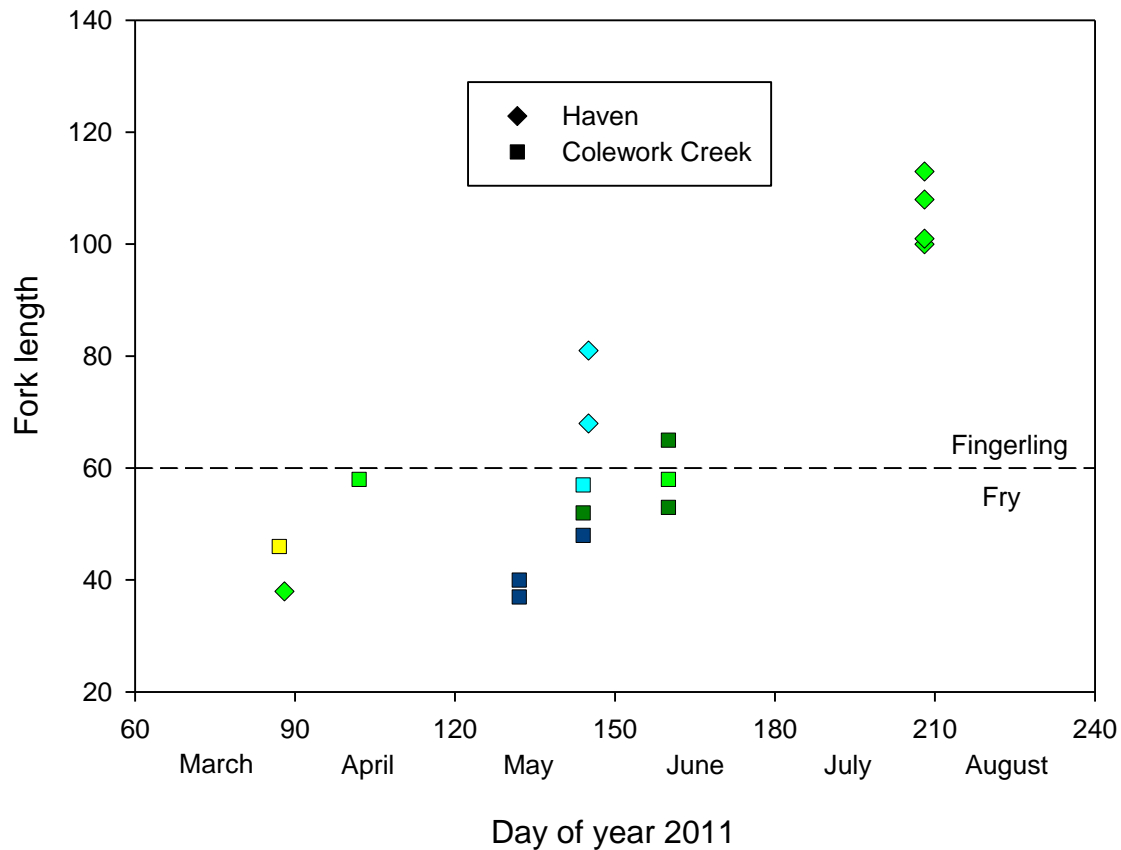
Sheet No. **G2.0**  
Project No. **CREST001**



# 2011 Genetics Data – Mainstem Sites



# 2011 Genetics Data – Young Bay Sites





# Pit Tag Array –Colewort Creek Restoration Site



Capture method: Dipnet

Coordinator ID: JAR

File id: JAR12086.SC3

Flags: AD

Hatchery: SPRC

Length: 66mm

Migr\_yr: 2012

Organization: USFWS

Release Site: SPRC

Releas\_v\_time: 4/13/2012 10:15:00

River\_km: 269

Rear type: H (hatchery)

t\_run: 3

t\_species: 1 (Chinook)

Tag date: 3/26/2012 13:51:00

Tag ID: 3D9.1C2DD7E4E8

Tag\_rem: blank

Tag site: SPRC

Wt: blank

## *Application of Effectiveness Monitoring to Habitat Restoration Projects in the Columbia River Estuary*

### **Findings:**

- ✓ Immediate response from juvenile salmon to restoration actions.
- ✓ Genetic data suggests that multiple genetic stocks are represented.
- ✓ Additional genetic analysis of CREST archived samples and at new restoration sites as they come on line would be informative.
- ✓ Passive and active restoration approaches are necessary based on restoration area conditions (topography, hydrology, soils).
- ✓ Effectiveness monitoring of CREST restoration sites should continue with fish community data collection where Scientific Take Permits can be obtained.
- ✓ Adapt monitoring methods and efforts to site specific projects goals.

# CREST



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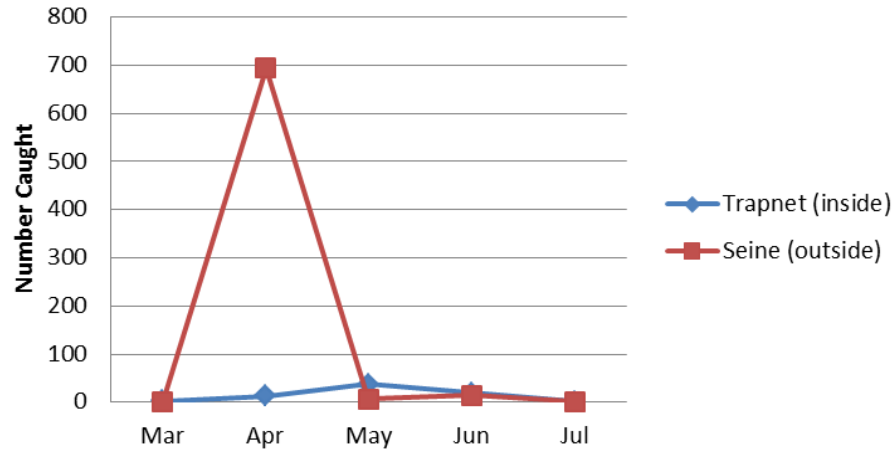
**Columbia River Estuary Study Taskforce**

# *Application of Effectiveness Monitoring to Habitat Restoration Projects in the Columbia River Estuary*

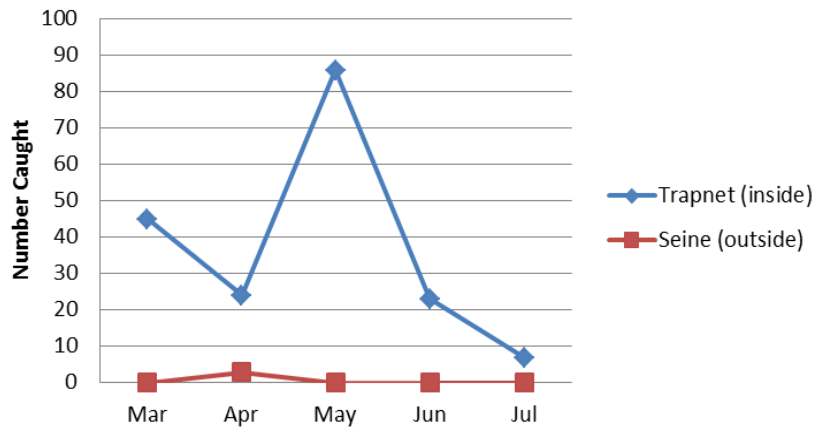


# Fort Columbia 2011

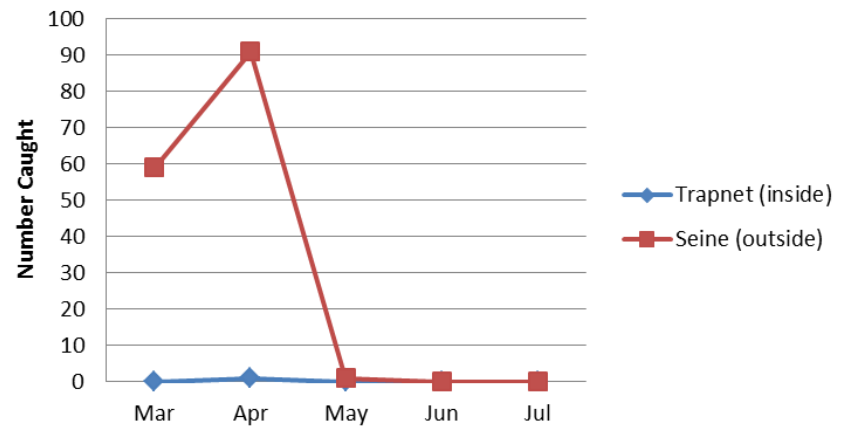
## Chinook



## Coho



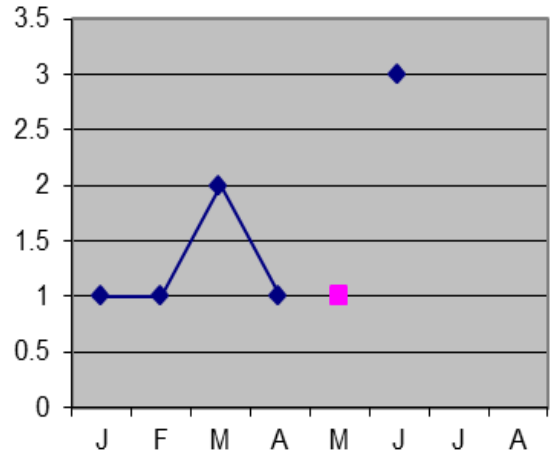
## Chum



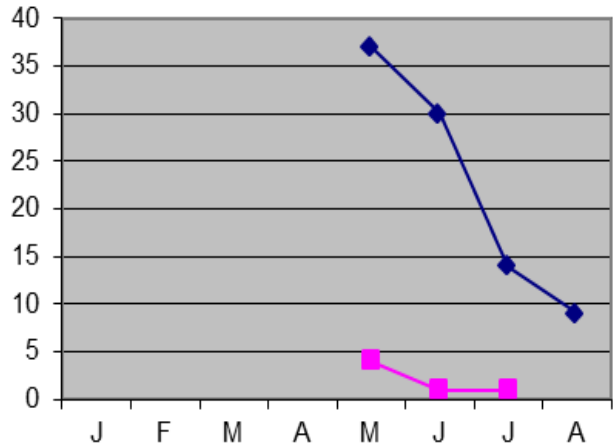
# Temporal Distribution of Coho at South Slough and Alder Creek 2007 - 2011

◆ South Slough  
 ■ Alder Creek

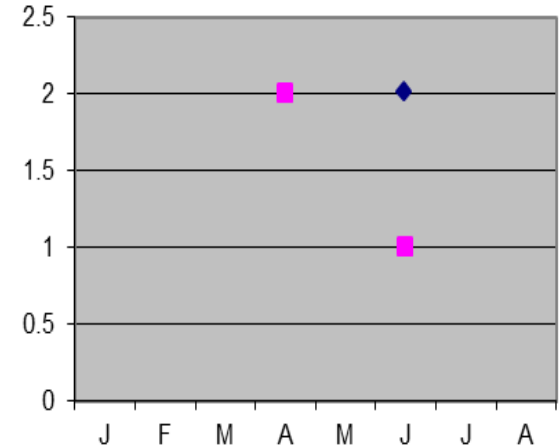
2007



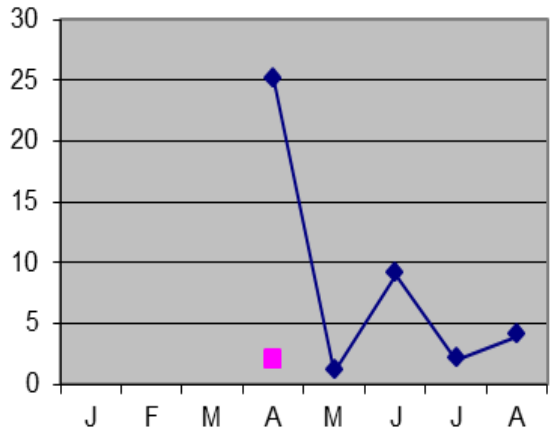
2008



2009



2010



2011

