

## HYDROLOGIC CONTROL IN A WILLAMETTE RIVER FLOODPLAIN WETLAND



**METRO**  
PEOPLE PLACES  
OPEN SPACES

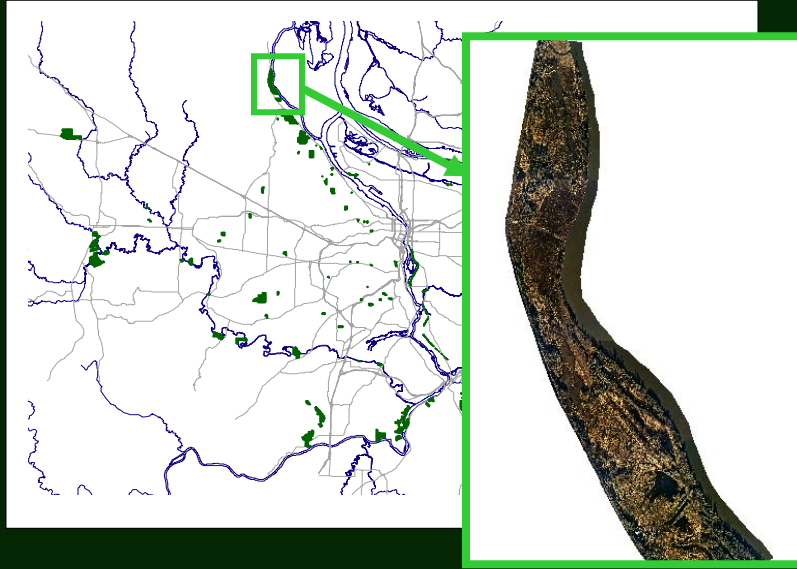
Jim Morgan, Natural Resources Program Leader, Metro Regional Parks and Greenspaces  
Curt Zonick, Natural Resources Scientist, Metro Regional Parks and Greenspaces

Most effective man-made designs  
borrow from natural models



**METRO**  
PEOPLE PLACES  
OPEN SPACES

## Metro Open Spaces and Project Location



## Conditions at time of acquisition



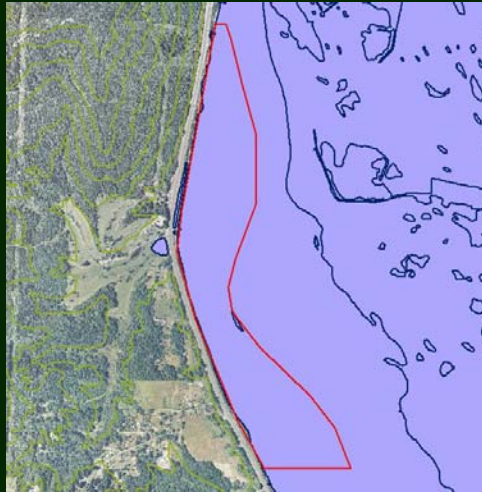
## 5 Years of recovery



## Restricted spring flooding prior to project



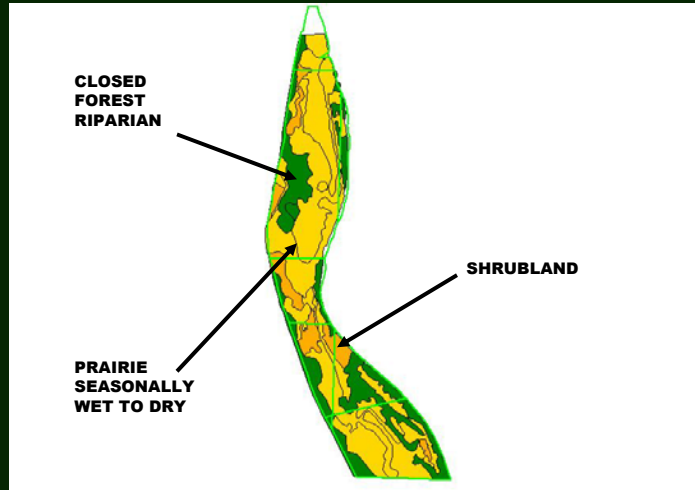
## 1996 flooding



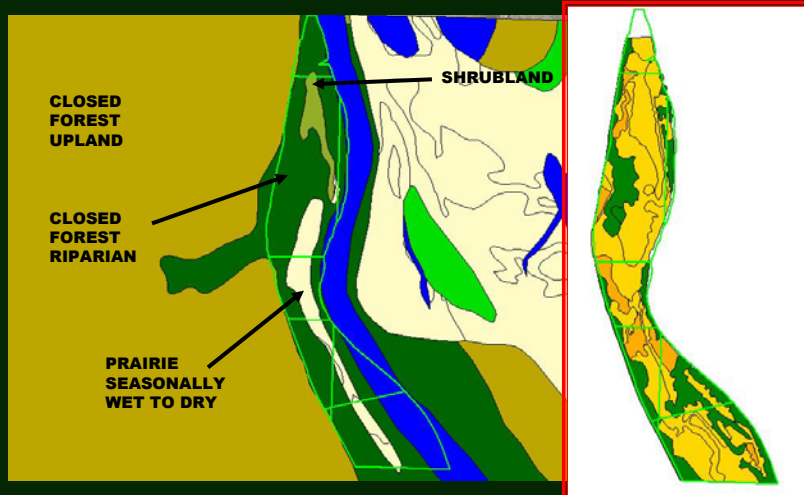
## Site's response to the 1996/1997 floods



## 2000 Vegetation mapping



## 1851 Government Land Surveys

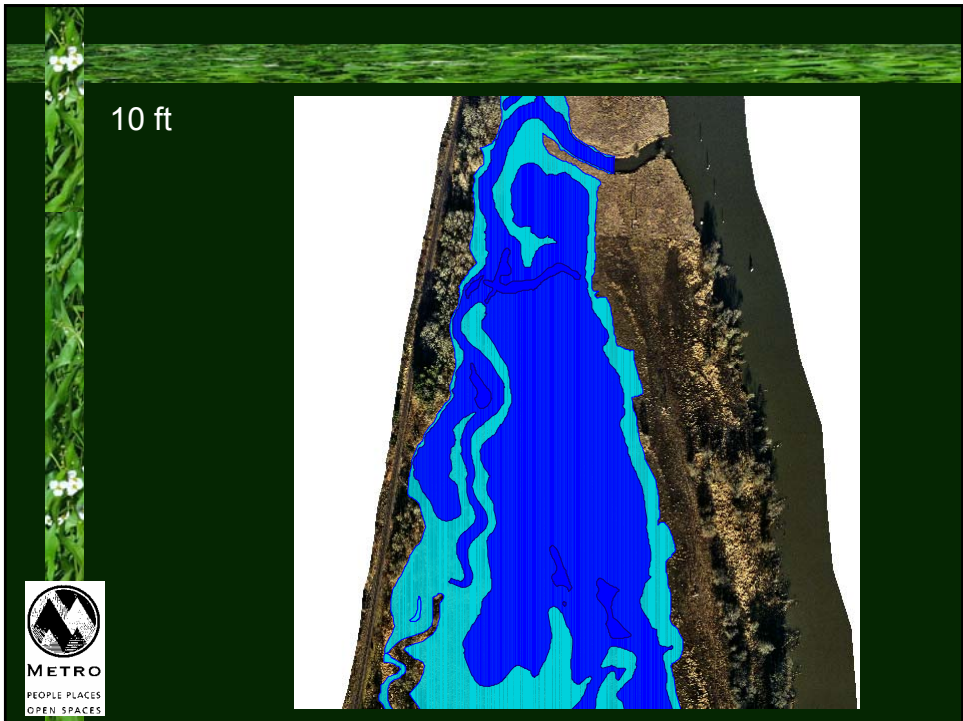
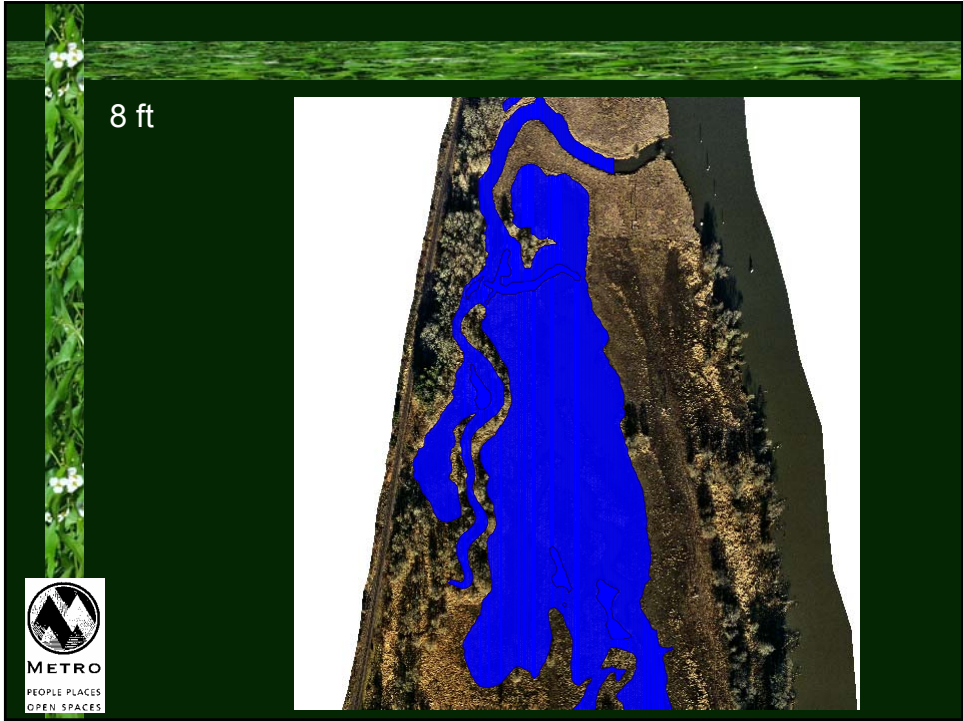


2000 Reed canarygrass coverage

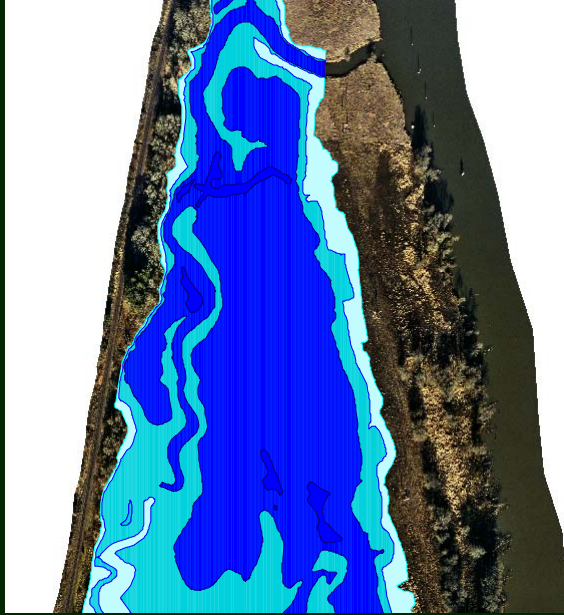


2000  
Topography

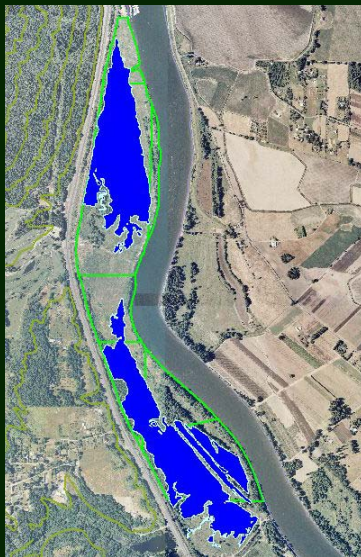




12 ft



## 2000 REED CANARYGRASS COVERAGE



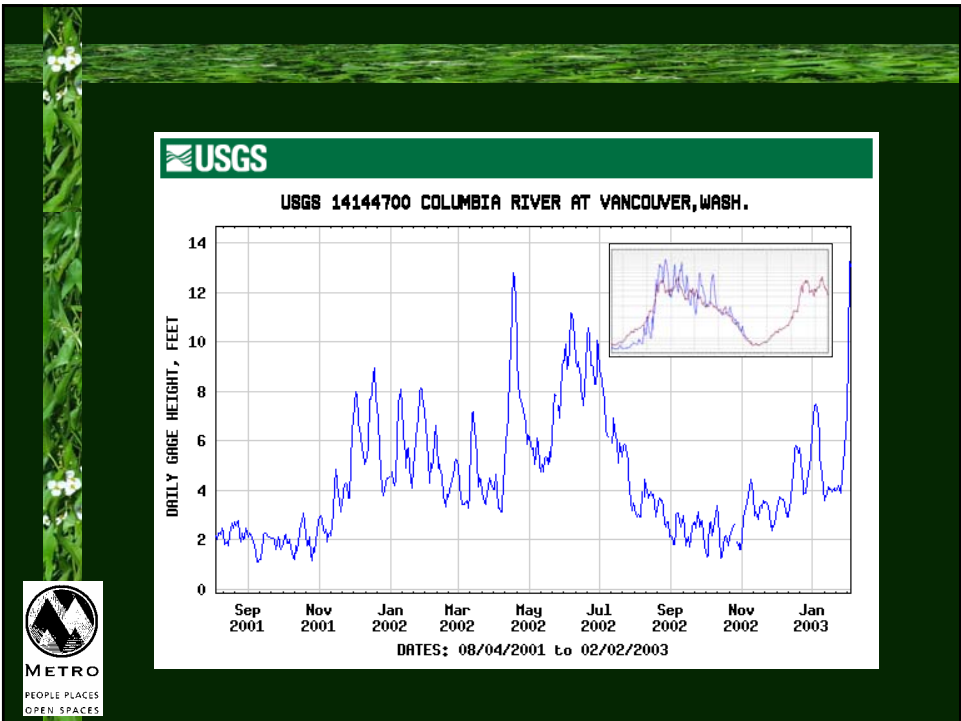
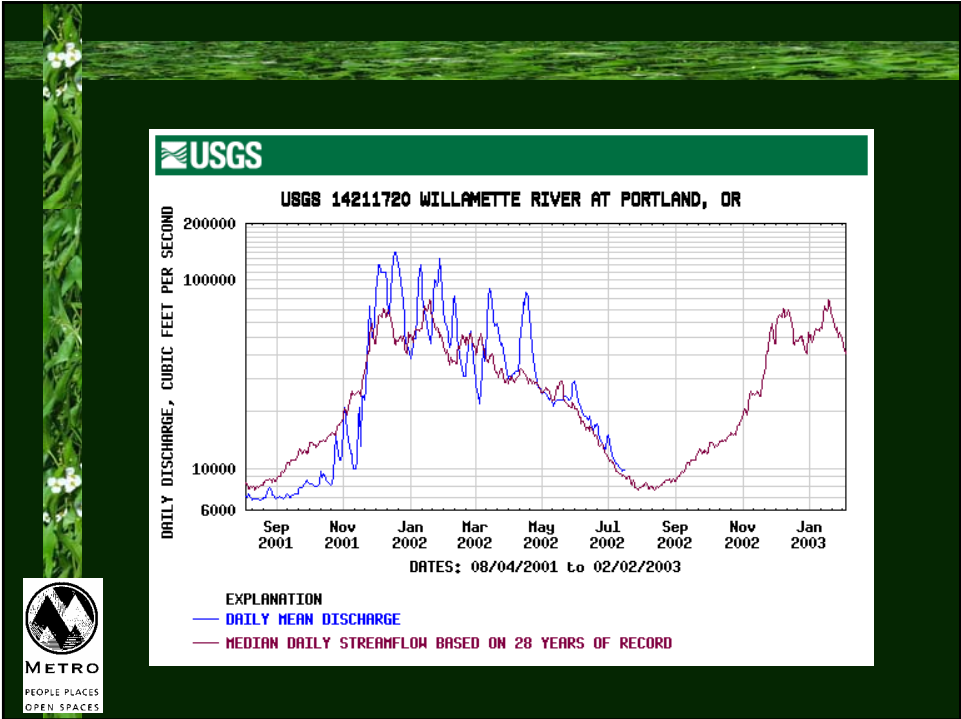
Acres of land that can be flooded by the structures:

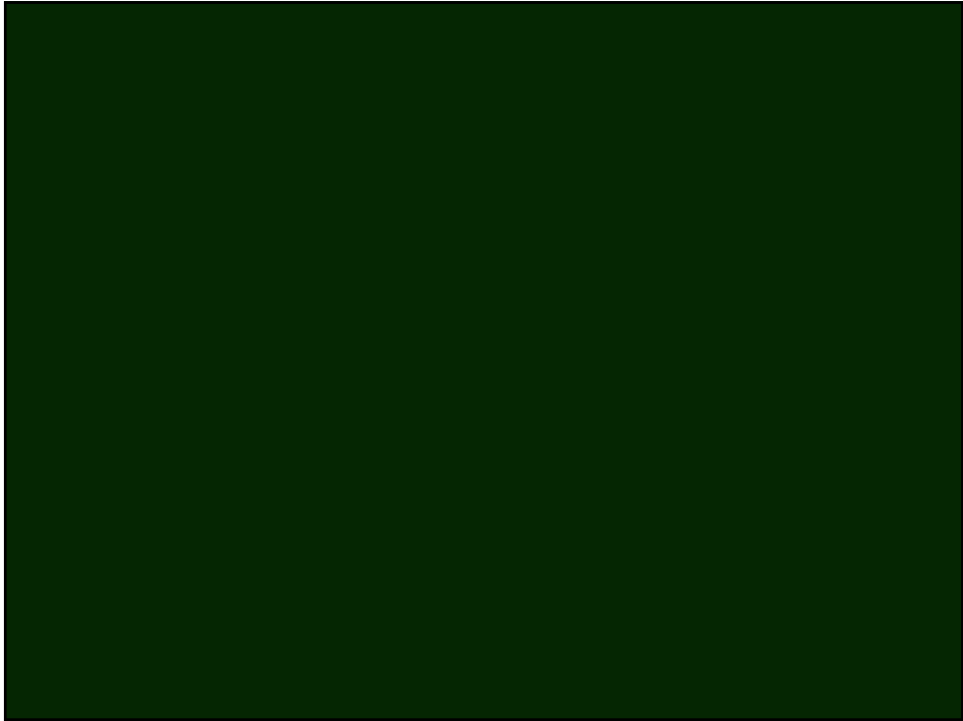
~ 160

Acre feet of water that can be stored by the structures:

~ 450





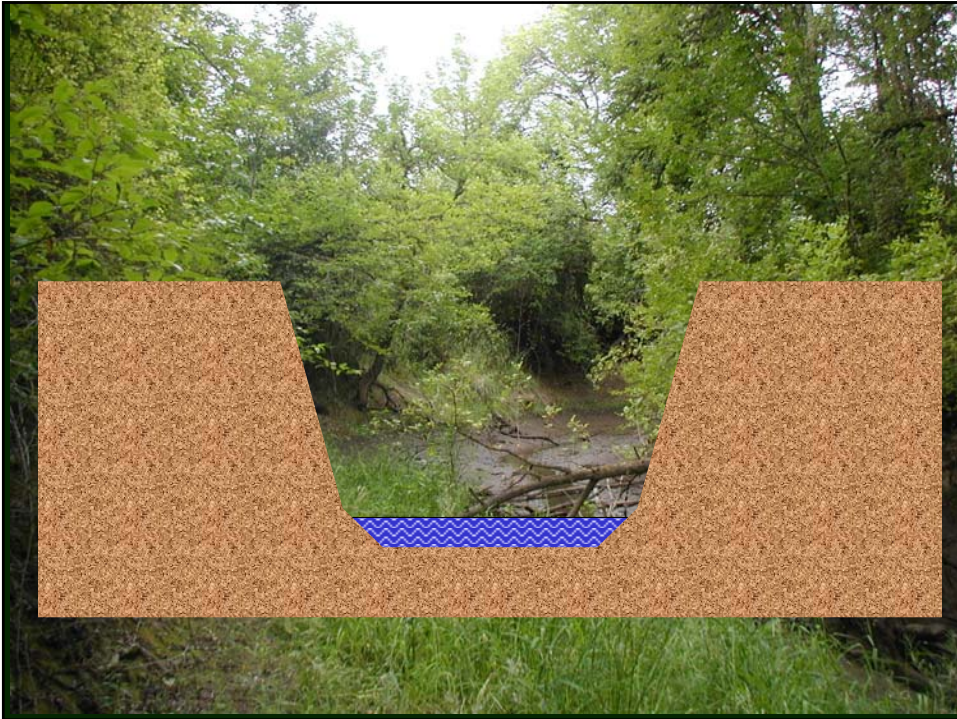


## Water Control Structures - Design & Installation



Both structures ~ 50ft long  
and 10 ft high and wide

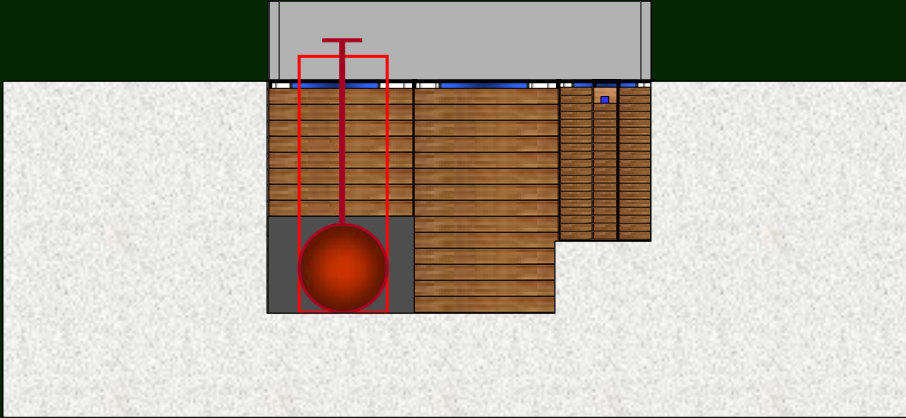




## Control Structure Schematic Design



## Year 2 Modifications



## Culverts and Risers



## Hilfiker Retaining Wall



## South structure - fully charged

Note Davit crane and crank for the reverse tidegate.



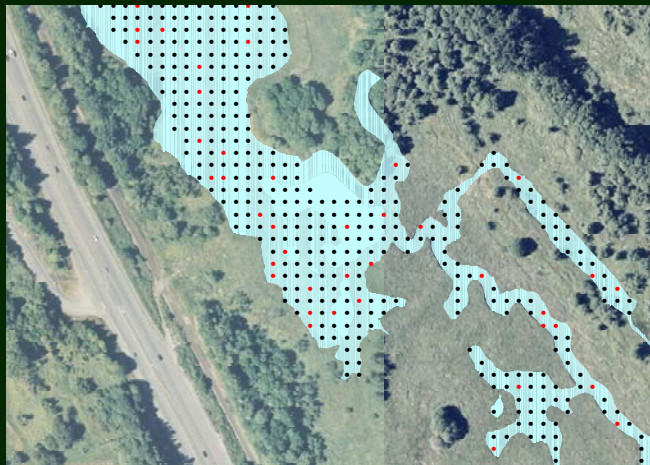
## Project-associated monitoring



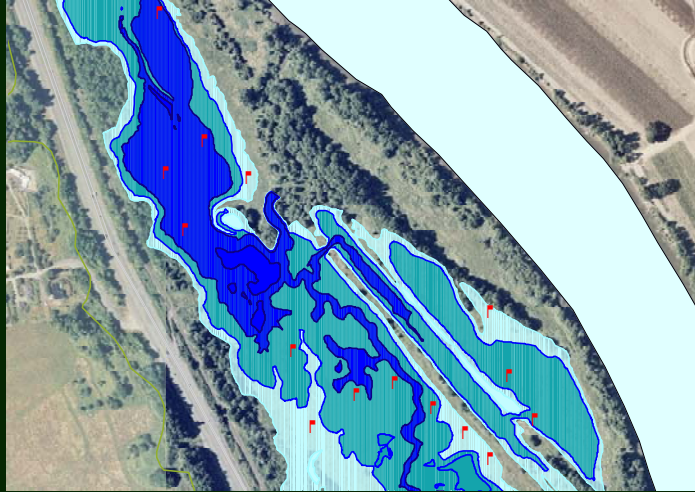
PLANTS - FISH - BIRDS - TURTLES - AMPHIBIANS

## Plant Monitoring

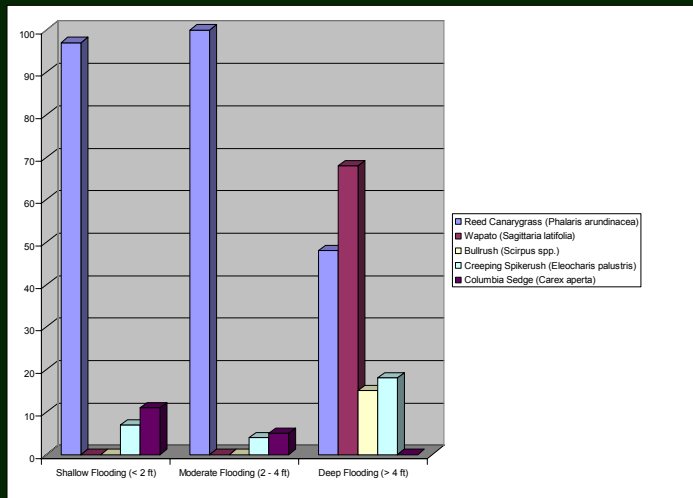
- Stratified random sampling of herbaceous cover



## Permanent Plant Transects



## Preliminary plant monitoring data



## Permits

- **US ARMY CORPS OF ENGINEERS and DIVISION OF STATE LANDS (\$ 500.00)**  
Joint wetland fill permit
- **US FISH AND WILDLIFE SERVICE and NATIONAL MARINE FISHERIES SERVICE (\$50,000.00)**  
Incidental take permit (bald eagle, Chinook salmon, coastal cutthroat trout)
- **MULTNOMAH COUNTY (\$500.00)**  
Floodplain development, and grading & erosion control permits
- **OREGON WATER RESOURCES DEPARTMENT (\$2,500.00)**  
Stored water permit
- **PRIVATE LANDOWNER (\$82,500.00)**  
Conservation Easement Neighboring property receiving stored floodwater

**TOTAL PERMIT COSTS  $\cong$  \$135,000.00 (\$3,500.00)**



## Conservation Easement



- **Approximately 30 acres of seasonal flood storage rights purchased**



## R&P Measures tied to the Biological Opinion for salmon

“Monitor the extent of delay or stranding that is occurring...to determine amount and extent of incidental take...”

T&C needed to implement the R&P:

- Monitor the structures to determine if juveniles are passing through structure
- Monitor the extent of juvenile stranding
- Analyze migration delays
- Send annual reports for 3 years post-construction
- If needed, pull boards, modify, and monitor for 3 more years



## How did (and how much did) Metro pay for the project ?

- N.A. Wetland Conservation Act Grant (U.S. Fish and Wildlife Service)  
[\$160,000.00]
- Wetland Reserve Program Agreement (NRCS)  
[\$120,000.00]
- Grant (Bonneville Power Administration)  
[\$95,000.00]
- Metro Open Spaces, Parks and Streams Bond Measure  
[\$90,000.00] [\$150,000.00 if revegetation included]
- Metro Regional Parks & Greenspaces Annual Operating Budget  
[\$75,000.00]
- Small Governments Wetland Conservation Grant (U.S. EPA)  
[\$38,000.00]



**TOTAL PROJECT COSTS  $\approx$  \$575,000.00**

## Amphibian egg mass surveys



## Northern red-legged frog egg mass data (*Rana aurora aurora*)

