

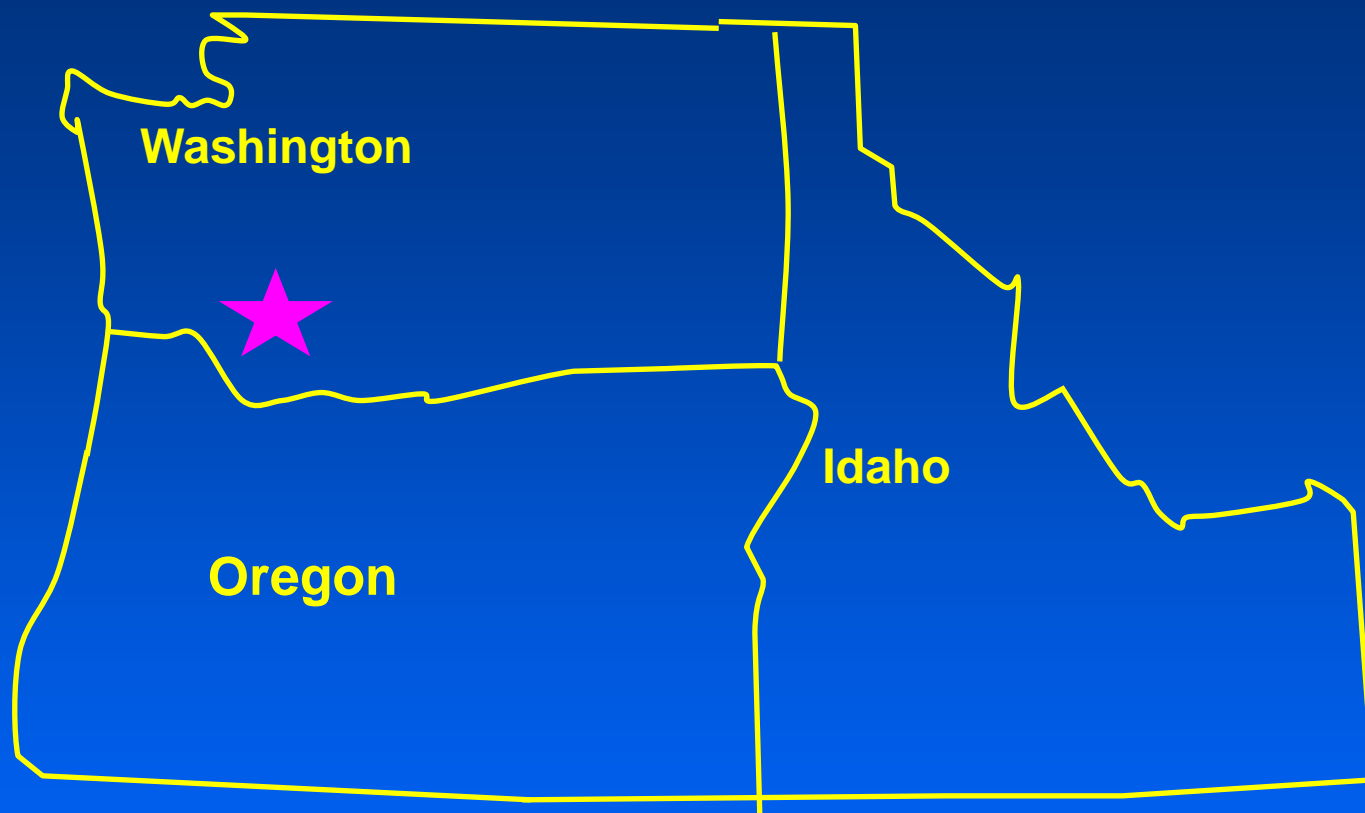
# Use of Hatchery Fish to Recolonize Historically Productive Habitat in the Upper Cowlitz River Basin

John Serl

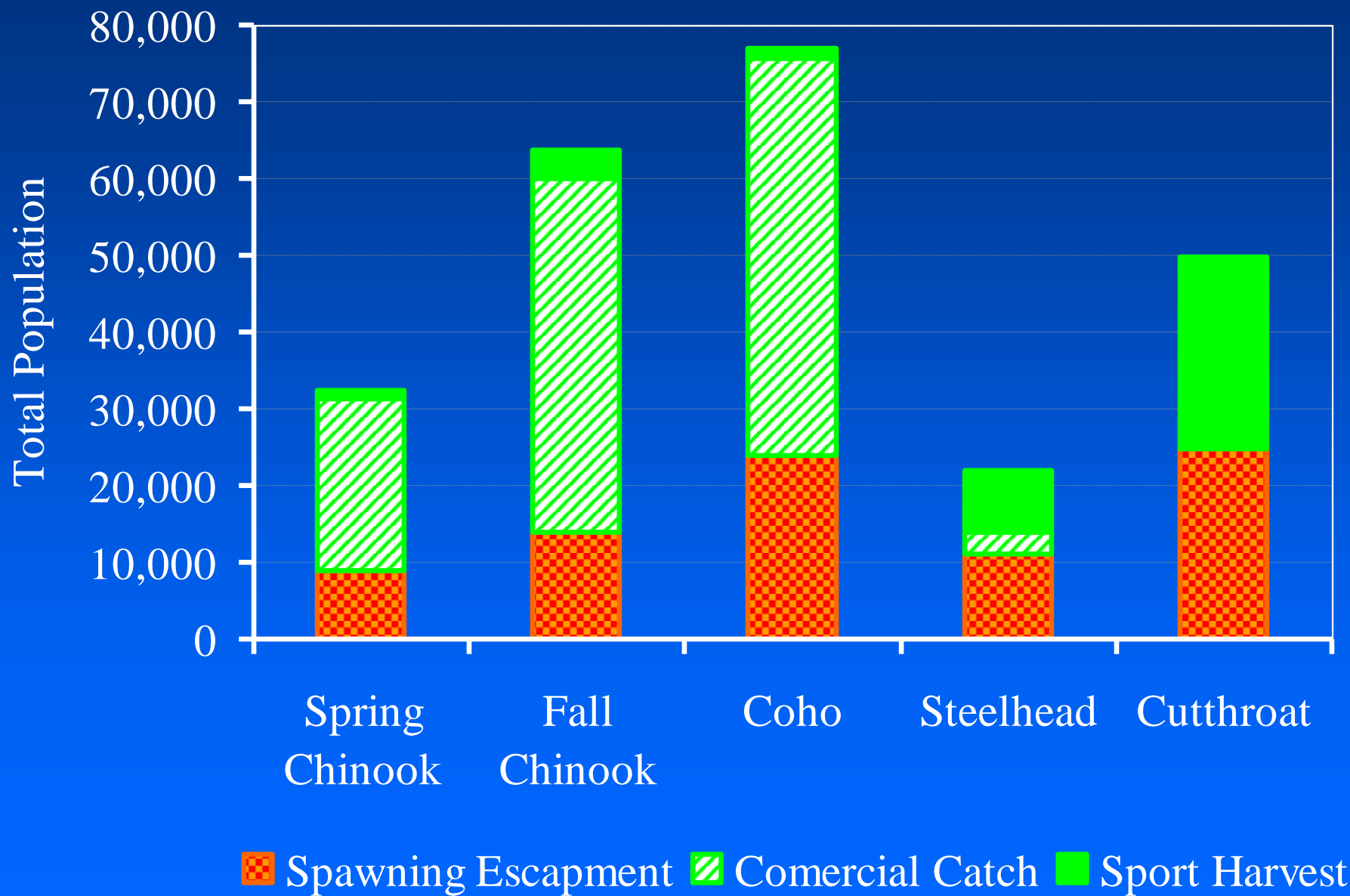
Washington Department of Fish and Wildlife  
December 8, 2016

# Reintroduction Cooperators

- Bonneville Power Administration
- Lewis County PUD
- Tacoma Power
- Pacific States Marine Fisheries Commission
- USGS – Columbia River Research Lab
- US Forest Service
- Friends of the Cowlitz
- Volunteers



# Cowlitz River Historical Abundance - 1948



# Mayfield Dam - 1962





# Mossyrock Dam - 1968



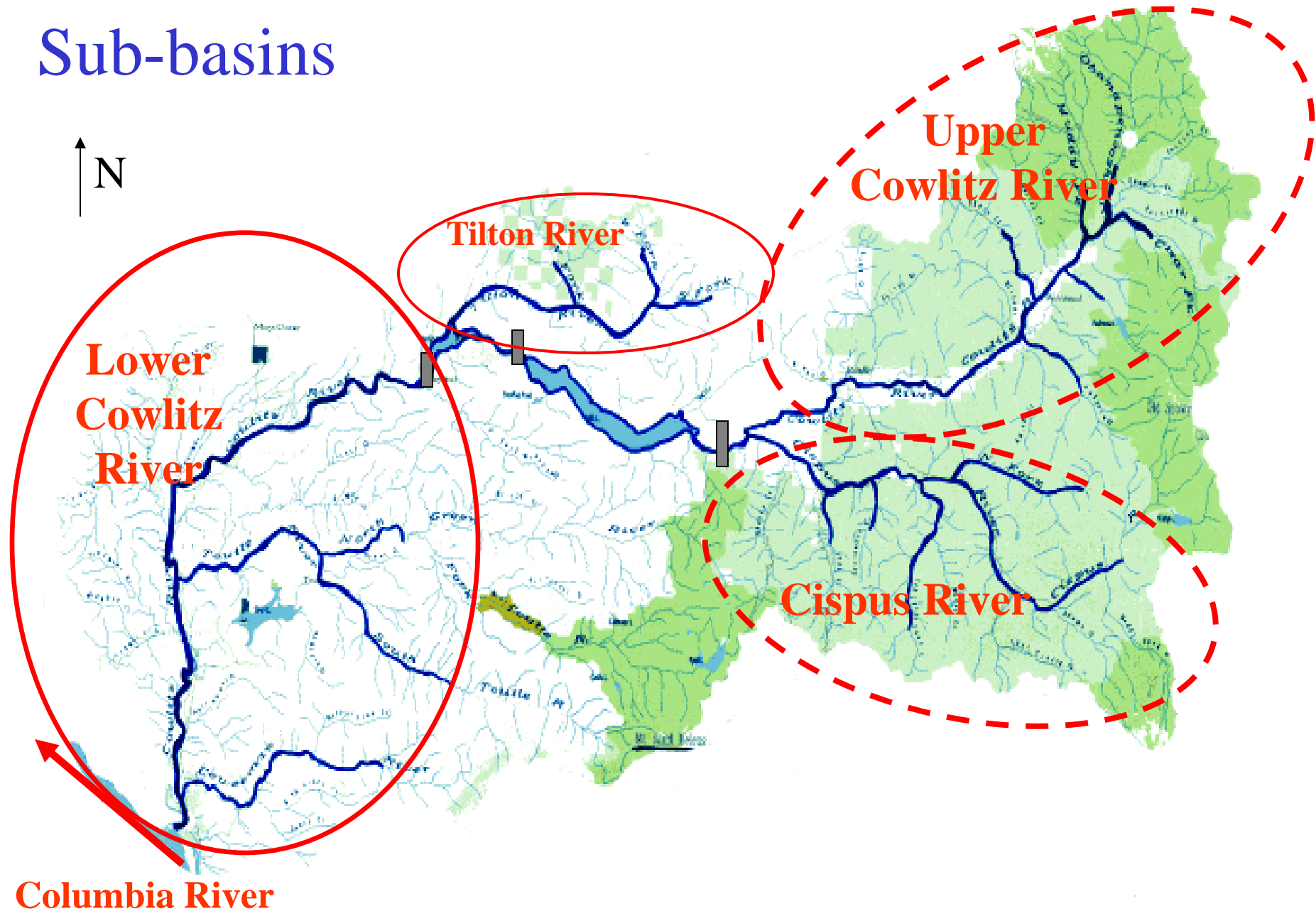


# Cowlitz Falls Dam – 1994/1996



# Cowlitz River Watershed

## Sub-basins

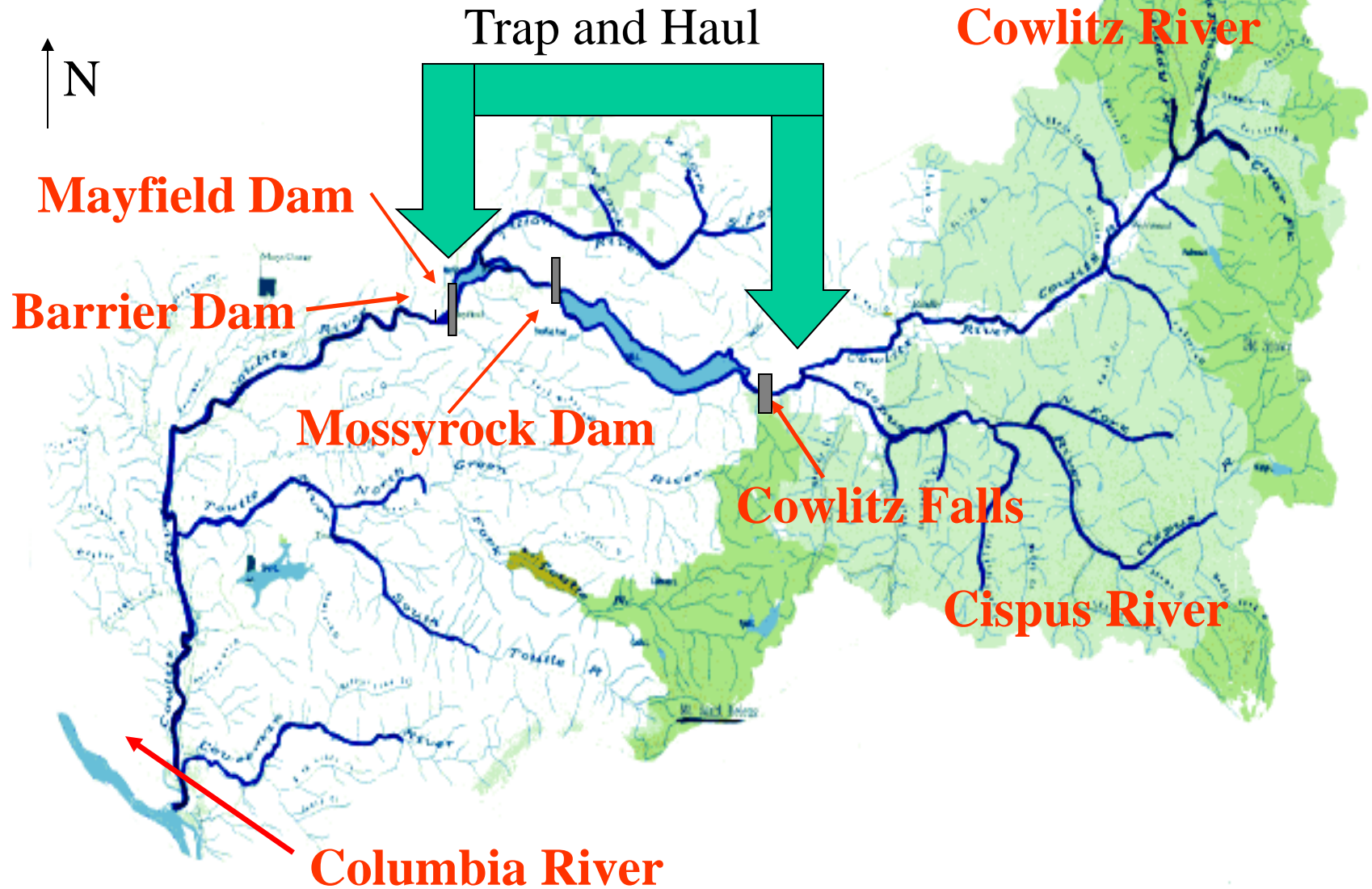




# Upper Cowlitz River Reintroduction

- 1980's LCPUD Cowlitz Falls Dam Development
- BPA Power Purchase Agreement
- Friends of the Cowlitz Involvement
- Reintroduction began 1994-1996
- Tacoma Power involvement after 2004

# Cowlitz River Watershed



# CFFF – Fall 1996





# Stock Selection

- Spring Chinook
- Fall Chinook – delayed
- Coho
- “Late” Winter Steelhead
- ~~• “Early” Winter Steelhead~~
- ~~• Summer Steelhead~~
- Cutthroat - ???

# Reintroduction Methods

- Fry/Fingerling releases
  - Small planting truck, hose
  - 5 gallon bucket
  - Helicopter and fire bucket (Steelhead)
- Smolts
  - Acclimate, ventral fin mark
- Hatchery Adults
  - Release locations

# Reintroduction Methods

- Fry/Fingerling releases
  - Coho = 1,000,000/year
  - Steelhead = 300,000/year
  - Spring Chinook = 450,000/year
- Smolts
  - Steelhead = 75,000/year
- Hatchery Adults
  - As available



# Upper Cowlitz Watershed Seeding

## Lessons Learned: Adults

- If you allow harvest, this will be the most popular with the public, can get hard to curtail!
- Utilizes the complete natural life cycle
- Release sites are hard to find and keep
- Un-imprinted fish will spawn near release sites



# Upper Cowlitz Watershed Seeding

## Lessons Learned: Smolts

- Need a secure location
- Lots of effort
- Good for imprinting to a specific area



# Upper Cowlitz Watershed Seeding

## Lessons Learned: Juveniles

- Good for fish that overwinter
- Helicopter or bucketing fish can scatter plant a lot of locations
- Need to be marked to differentiate from natural production

# Upper Cowlitz Watershed Seeding

- *Juvenile supplementation ended after 2009 to focus on Natural Production*
- Adult Supplementation using integrated fish for coho and steelhead
- Release Hatchery Spring Chinook Adults and Artificial Redds

# Spring Chinook Artificial Redds

*or Now I Know Why Salmon  
Die After Spawning*



# Spring Chinook Artificial Redds

- *Cowlitz Salmon Hatchery Spring Chinook Production was expected to double in 2011/2012*
- Few adults to seed system
- No time to permit RSI
- Winter snow made RSIs infeasible due to limited/no access

# Spring Chinook Artificial Redds

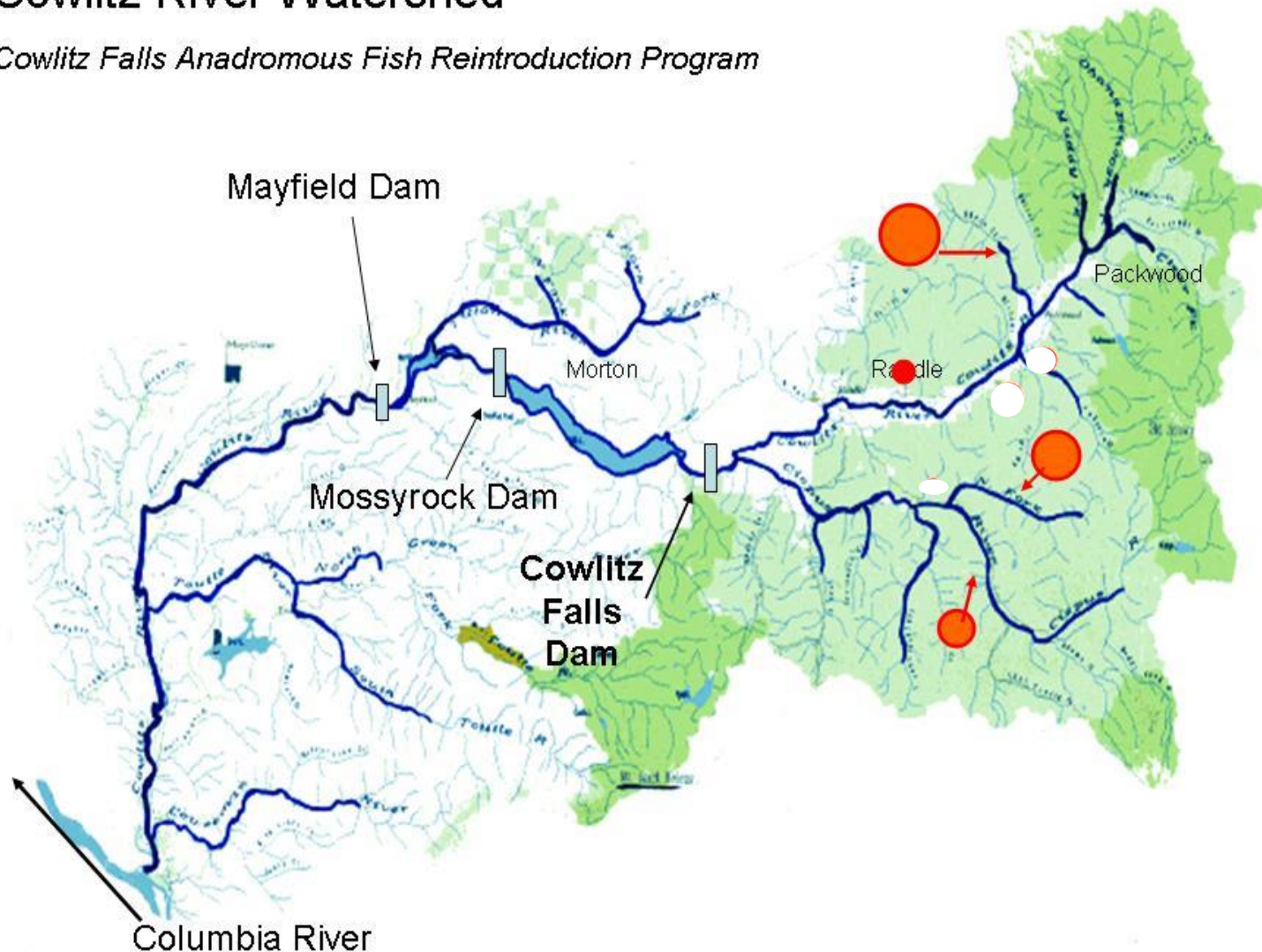
## *Objectives*

- Produce juvenile spring Chinook migrants
- Produce fish imprinted to sites not being used
- Have fun

# Artificial Redds Locations

## Cowlitz River Watershed

*Cowlitz Falls Anadromous Fish Reintroduction Program*



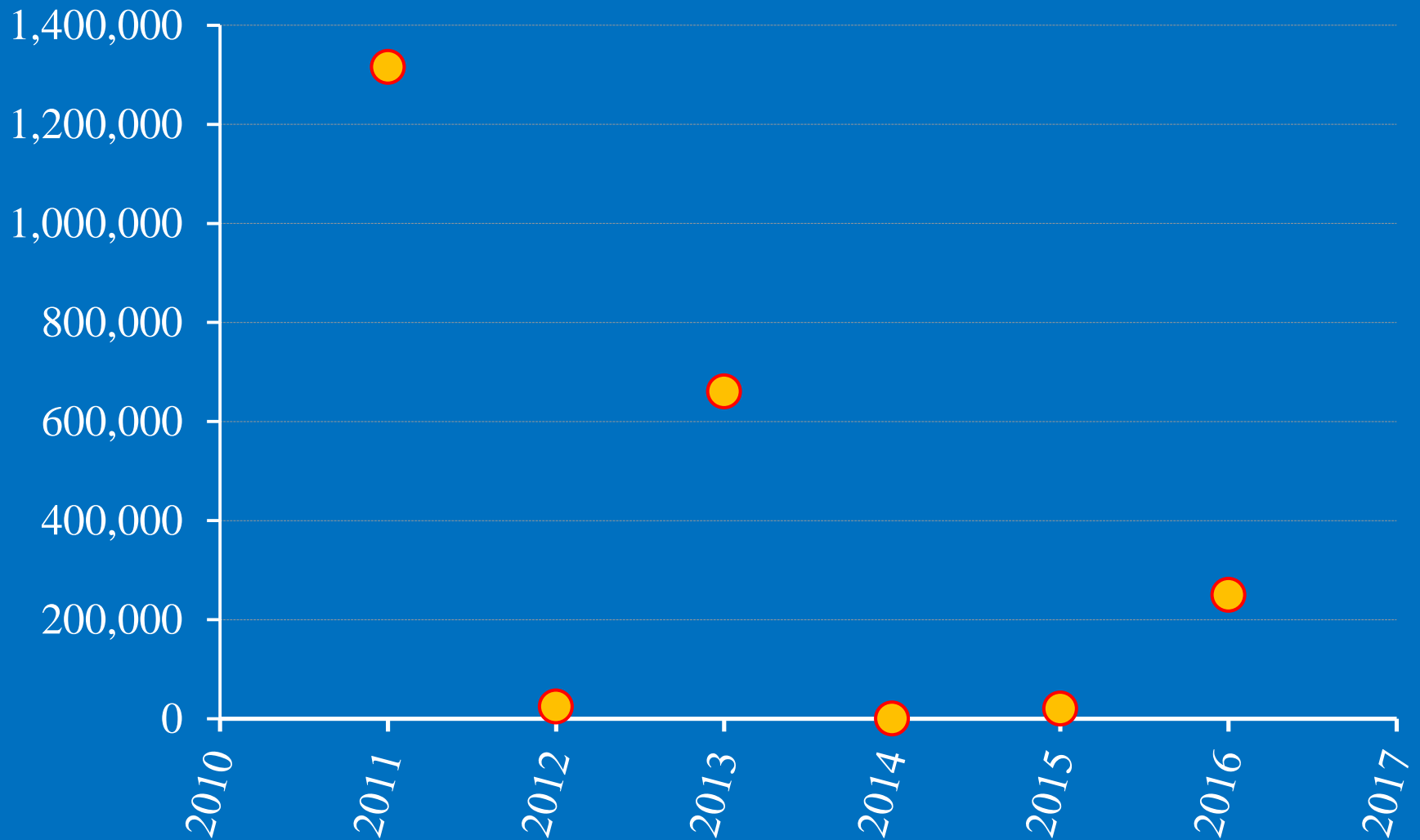
# Spring Chinook Artificial Redds

## *First Year 2011*

- 1,315,900 eggs planted
- 282 total artificial redds
  - 144 NF Cispus River
  - 38 Upper Cispus River
  - 100 Skate Creek (Upper Cowlitz River)



# Artificial Spring Chinook Redds





# Artificial Spring Chinook Redds





# Redd Construction





# North Fork Cispus





# Skate Creek – lateral bars













# Typical Artificial Redd





# Results

- Non-invasive observations
- All redds appeared to persist
- Emerged sack fry at all sites
- Eggs outside of redds at all sites
- No noticeable quantities of dead eggs

# Results



# Integrated Hatchery Adult Releases

*Having your cake and eating it too*



# Upper Cowlitz Coho

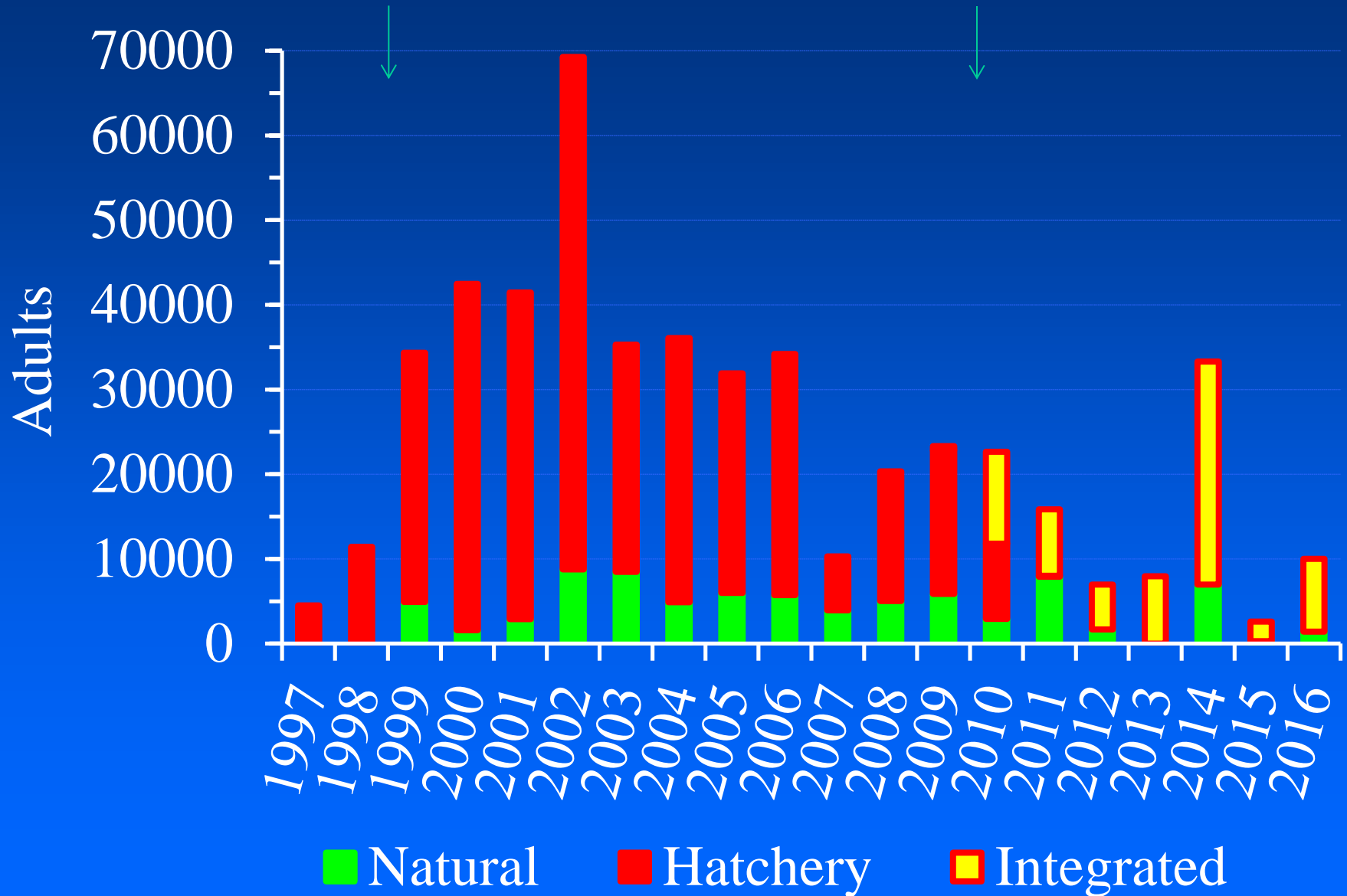




# Integrated Coho Production

- 100% Natural Origin Brood
- All marked AD Clip + CWT
- At least one generation in natural environment for every generation in hatchery
- Compensate for poor collection efficiency
- Supports fishery and recolonization

# 1997-2016 Upper Cowlitz Coho



# Questions?

