Presentation Outline

- Aquatic species in the basin
- Data gaps relative to dam assessment
- Fish and habitat studies
- Information collected to date
Native fishes in the Chehalis Basin

- Mountain whitefish
- Eulachon (?)
- Pacific lamprey
- River lamprey
- Western brook lamprey
- White Sturgeon
- Green Sturgeon
- Peamouth
- Speckled Dace
- 3-spine stickleback
Exotic fishes in the Chehalis Basin

- Smallmouth bass
- Rockbass
- Largemouth bass
- Brown bullhead
Stillwater-Breeding Amphibians in Chehalis Basin

Northern red legged Frog

Oregon Spotted Frog

Pacific Treefrog

Western Toad

Northwestern Salamander

Photos by Marc Hayes, WDFW except where indicated.
Salmon and steelhead in the Chehalis Basin

![Graph showing salmon and steelhead return year vs. number of spawners.]

- **Number of Spawners**
  - Coho
  - Fall Chinook
  - Spring Chinook
  - Steelhead
  - Other salmonids: Chum, Cutthroat

### Return Year
- 1980
- 1985
- 1990
- 1995
- 2000
- 2005
- 2010
Chehalis Basin Contribution to WA Coast

Data are average spawner escapement, 1996-2012.
Fish species in the Upper Chehalis Basin

- Limited information on all fish distribution, especially around and upstream of proposed dam site.
- Field studies in 2013 improve measure of salmon and steelhead above dam site (spawner and smolt). Will be compared to entire basin.
- Upper Chehalis is not in a steady state. Re-colonization occurring following flood events.
Presentation Outline

• Aquatic species in the basin
• Data gaps relative to dam assessment
• Fish and habitat studies to fill data gaps
• Information collected to date
Data Gaps Relative to Dam Assessment

- What will be lost in impoundment area?
- What will change in river below dam?
- What will the impact be to fish spawning and rearing above impoundment?
- What kind of fish passage allowances are needed?
- How would changes in river temperature affect fish?
Presentation Outline

- Aquatic species in the basin
- Data gaps relative to dam assessment and ASEP
- Fish and habitat studies to fill data gaps
- Information collected to date
Fish habitat influenced by river flows

Rain Dominant Hydrology

Mean Monthly Flow (cfs)

Data source: USGS 12020000 (Doty gage)
Fish and habitat studies

• Adult spawners
• Smolt abundance
• Riverscape fish & habitat
• Reach scale fish & habitat
• Fish movements (summer & winter)

Area above dam site

Area above Skookumchuk
ADULT SPAWNER SURVEYS
What is adult fish abundance, timing, and distribution?

• Spawner counts, timing, location, age composition

• Chinook (spring & fall), Coho, Steelhead
**SMOLT TRAP**

What is outmigrant fish abundance, timing, and diversity?

- Abundance, migration timing
- All species moving downstream including salmonid smolts

Chehalis River smolt trap is operated near river mile 108 (Picture is not Chehalis).
RIVERSCAPE SURVEYS
Where does summer rearing occur for what species?

- Snorkel (fish) & foot (habitat) surveys
- Include species observable using snorkel methods

Downstream snorkel surveys on the Chehalis River
REACH SURVEYS
Which habitats are associated with which fish species?

• Snorkel, electrofish, seine
• All fish species

Seine collections of fish in the Chehalis River
FISH MOVEMENTS (SUMMER & WINTER)
Importance of cool water refugia for summer rearing and mainstem for overwinter rearing

• Juveniles tagged and released
• Tag detection arrays
• Chinook, Coho, Steelhead

PIT antenna array near RM 108 on Chehalis River
Field crew tagging juvenile salmonids
Presentation Outline

- Aquatic species in the basin
- Data gaps relative to dam assessment and ASEP
- Fish and habitat studies to fill data gaps
- Information collected to date
Fish-Habitat Studies During Summer Rearing Period

- Riverscape surveys
- Summer movements

Data collection period July 15 – October 25, 2013
Riverscape View: Patterns of Fish and their Habitat

Describes which fish and how many fish are using mainstem during summer flows above and below dam site.

John Winkowski, WDFW
Mara Zimmerman, WDFW
Summer Fish Distribution

• Counts by species and life stage
• Limited to pelagic species
Summer Fish Distribution

Salmon 0+

Survey Kilometer

Count

11/12/2013
Summer Fish Distribution

Salmon 0+

Pikeminnow

Smallmouth Bass

Trout 0+

Redside Shiner

Bluegill

Trout 1+

Dace

Survey Kilometer

Survey Kilometer
Improved Understanding from Riverscape Study

• Continuous measure of fish and habitat above, within, and below impoundment area.
• Other aquatic species (amphibians, mussels).

• Numbers are relative to the Chehalis River. Can’t be directly compared to other systems.
Summer Movement of Juvenile Salmonids

*Direction and distance of summer movements. Applicable to fish passage needs at dam site and summer thermal refugia.*

John Winkowski, WDFW
Mara Zimmerman, WDFW
PIT Arrays Detect Tagged Fish

Mainstem PIT Antenna Array near potential dam site

Rock Creek PIT Antenna Array
Locations of PIT Arrays

- Coho = 405
- Steelhead = 28

Legend:
- PIT Tag Arrays
- Chehalis Mainstem
- Named Streams
- Multipurpose Inundation
Improved Understanding from Summer Movement Study

• Do fish move upstream through the dam site during summer months?
  
  **Summer fish movement observed upstream and downstream through the dam site**

• What are the movement patterns?

• Is movement correlated with river temperature?
Summary to Date (Preliminary Results)

• Chehalis River supports a diverse assemblage of aquatic species.
• Different fish assemblages use different parts of the mainstem river for summer rearing.
• A high proportion of the salmon and steelhead summer rearing in the mainstem is confined to areas above the proposed dam site.
• Summer movements of coho and steelhead were documented through the proposed dam site.