

# Packwood Lake Hydroelectric Project

Resolution of Tailrace Slough Issues

Proposed Changes to Outage Timing  
and Lake Levels

# Tailrace Slough Issues

- Project annual outage currently scheduled in October

## Impact:

- Project tailrace flows attract spawning Chinook to the tailrace slough area in August and September
- October shutdowns can strand fry or dewater redds in the slough

# Tailrace Slough Issues, cont'd

- During low water periods in August and September, the Project may shut down (usually weekends) due to low inflows and lake level restrictions
  - Impact:
    - Plant shutdowns can strand fry or dewater redds, depending upon the configuration of the Tailrace Slough and its dependence upon the Project.

## Upper Cowlitz River Fish Periodicity

Species	Lifestage	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept
Spring Chinook	Spawning												
	Incubation												
	Rearing												
Coho	Spawning												
	Incubation												
	Rearing												
Steelhead	Spawning												
	Incubation												
	Rearing												
Cutthroat Trout	Spawning												
	Incubation												
	Rearing												
Rainbow Trout	Spawning												
	Incubation												
	Rearing												

Based on:

John Serl, WDFW Fish Biologist, Cowlitz Falls (May 10, 2007)

# Proposed Solution

- Change Outage to late July or early August
- Provide lake elevation flexibility to provide tailrace flows for low water periods in late August and September

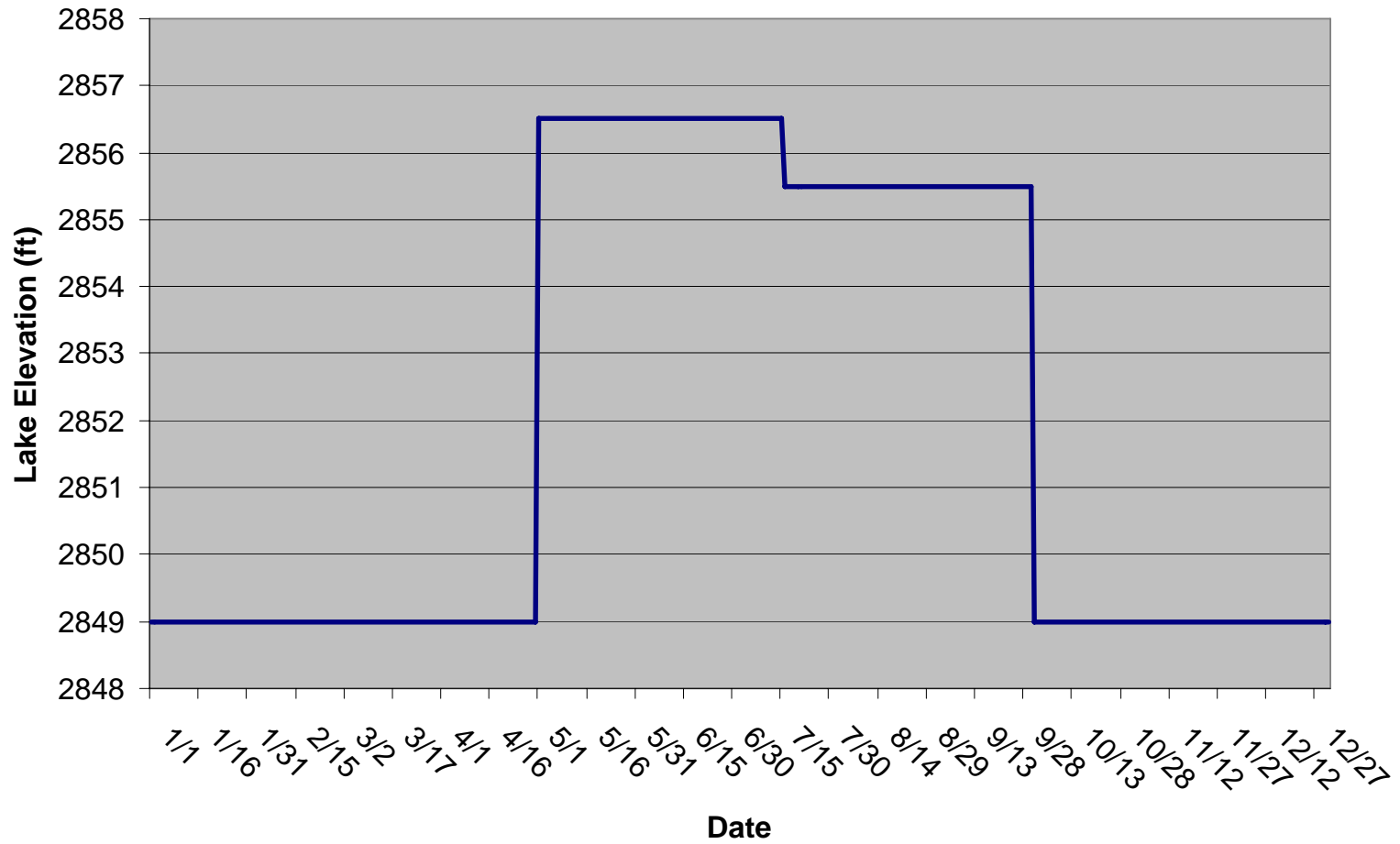
# Benefits

- Move outage to August
  - Spring Chinook spawning is dependent upon trap and haul from lower dams. Spawning typically begins in the middle of August.
  - During August Spring Chinook will not be attracted into the tailrace slough by project flows; rather, will only be attracted to spawn in tailrace slough when Cowlitz River flows are sufficient.
  - Warm water temperatures in the tailrace slough are not a project effect during an outage.
  - Project will be able to add water to the tailrace slough in September, when Cowlitz River flows are historically lowest.

# Benefits, cont'd

- Provide Lake Elevation Flexibility
  - Allows project to draw lake elevation down prior to the outage to minimize spill
  - Allows project to provide enhanced flows for spring Chinook spawning in lower Lake Creek in August and September
  - Allows the project to operate during low water periods, preventing potential fry stranding or desiccation of redds in tailrace slough (avoids weekend shutdowns)

# Proposed Packwood Lake Elevation Rule Curve



# Proposed Packwood Lake Elevation Rule Curve

- During Summer/Fall Period
  - No maximum lake elevation restrictions
  - Minimum lake elevation of 2856.5 from May 1 through July 15
  - Minimum lake elevation of 2855.5 from July 16 through September 30
  - During the outage, Packwood Lake will naturally rise based on net inflow (inflow from the tributaries minus instream flow)
  - Minimum lake elevation of 2849 ft from October 1 through April 30

# Benefits

- Minimum lake elevations of 2856.5 ft during from May 1 through July 15 protect access to Packwood Lake tributaries for adult rainbow trout spawners
  - Spawning occurs mid-May through early July

# Benefits, cont'd.

- Minimum lake elevations of 2855.5 ft from July 16 – September 30 allows lake to be drawn down prior to the project shutdown without impacting fish in tributaries
  - Rainbow trout adults leave tributaries immediately after spawning
  - Rainbow trout fry emerge from late July through early August
  - Average net August inflows to the lake will increase stage approximately 2 inches per day (at 50 cfs inflow) during the project shutdown; Additional 1 foot of elevation should occur within 1 week
  - Provides ability to supplement flows down Lake Creek in early August for spring Chinook spawning