



North Fork Adult Sorting Facility

Garth Wyatt

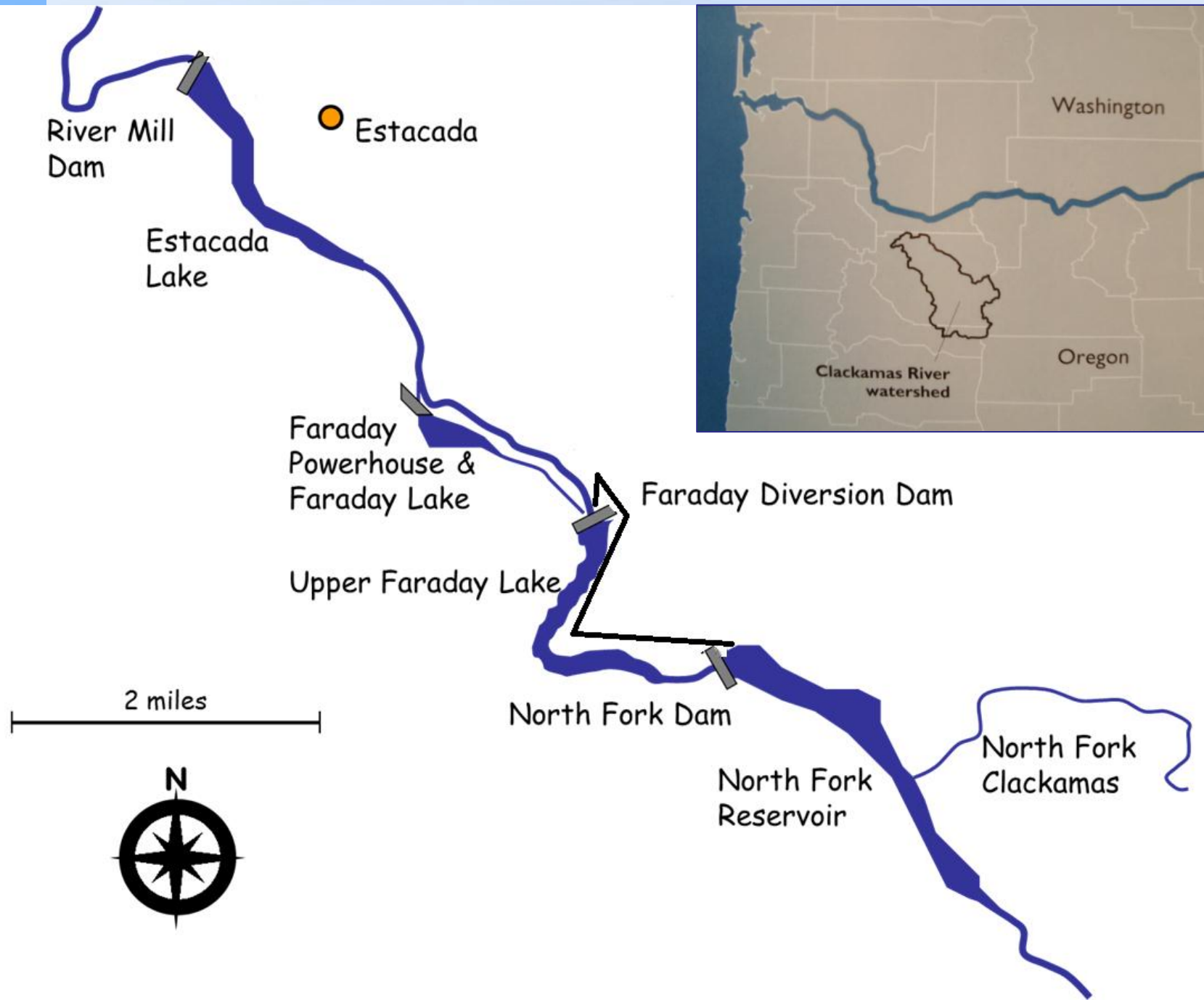
Portland General Electric Co.

December 1st, 2015

NWFCC



Portland General Electric





Upper Clackamas Hatchery Management

1. 1958-1998 managed as an integrated hatchery program
 - volitional passage upstream, photo enumeration
2. Wild fish sanctuary established in 1999
 - Necessitated the physical sorting of all upstream migrating salmonids





Facility Background

- Buckley style adult trap constructed in 1958
- Not designed to sort fish, hydro-system evaluation use
- No onsite holding/loading tanks = inefficient operation
- Reliance on electrical motors/winches





- Daily counts in September 250-300 CHS, 10% wild to 90% hatchery
- Peak days ~600 fish





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- Pre-spawn CHS mortality ~12% (n = 332) (ODFW 2003, 2005-2007)

New Adult Sorting Facility Key Features

- Designed to NMFS criteria (1000 fish capacity)
- Cold water supply line (gravity fed)
- “Hands/anesthetic free” sorting, automated data recording
- Provisions for future automated tag based sorting (CWT/PIT detector)
- Multiple holding tanks with water to water transfer.



River Mill
Dam

Estacada

Estacada
Lake

Old Facility

Faraday
Powerhouse &
Faraday Lake

Faraday Diversion Dam

Upper Faraday Lake

New Facility

North Fork Dam

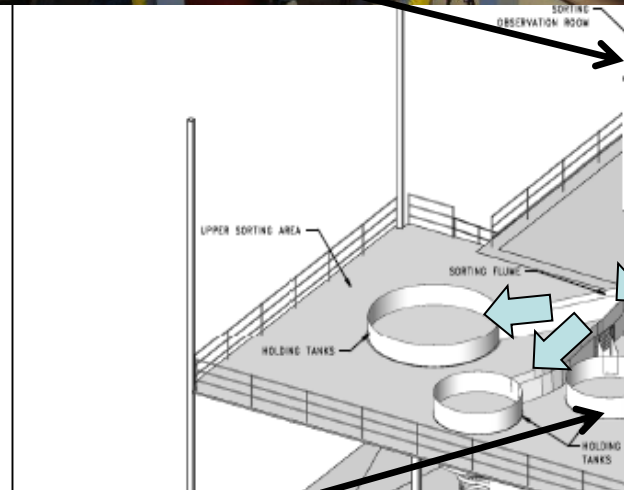
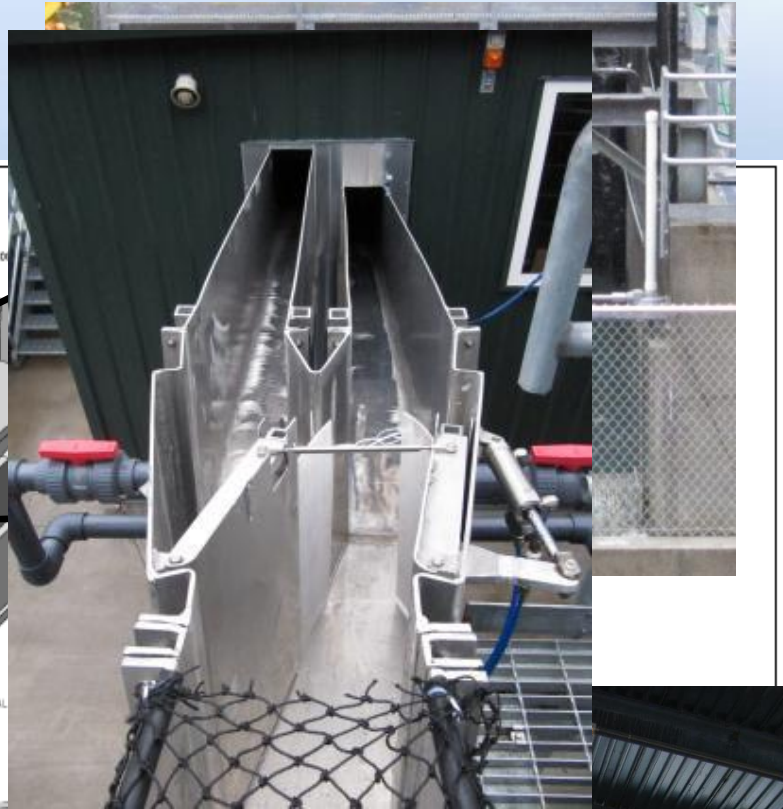
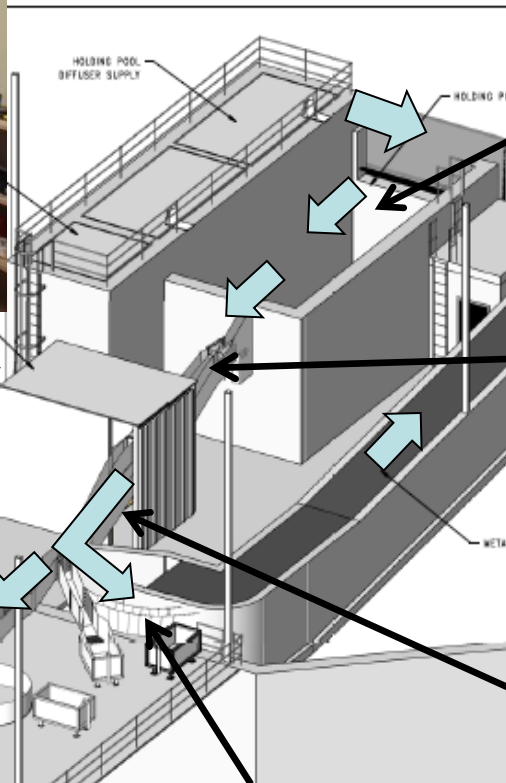
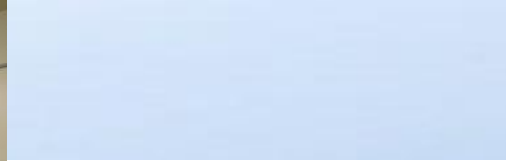
North Fork
Reservoir

North Fork
Clackamas

2 miles



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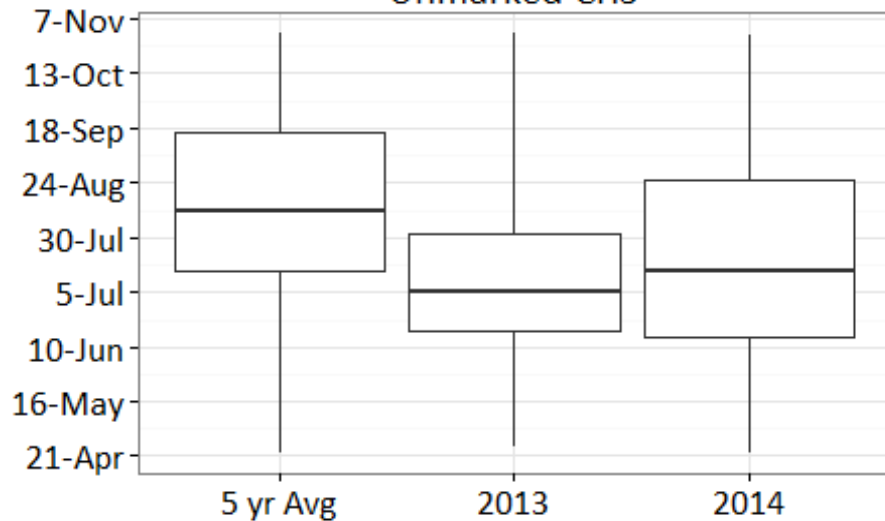
Observation Room/Control Center

- Remote control of brail floor/false weir
- “Shift on the fly” capability
- Automated counter
- Real time display (PTZ camera)

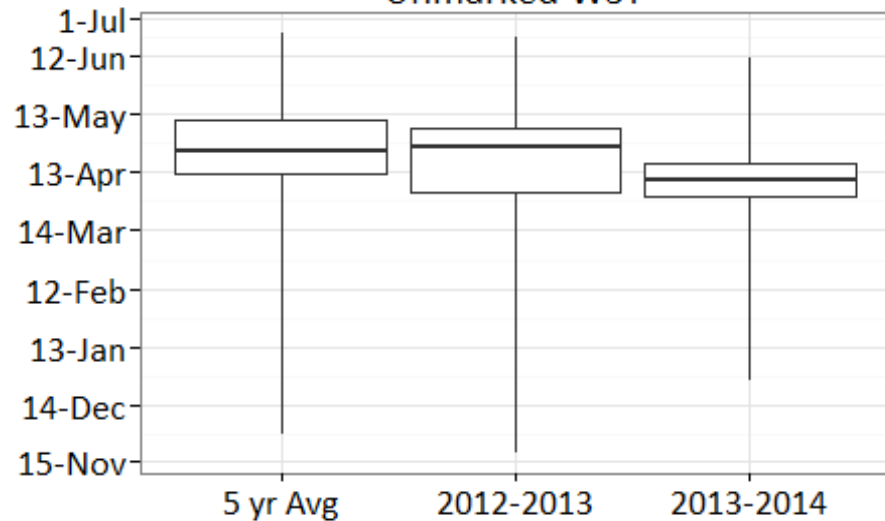


Run Timing

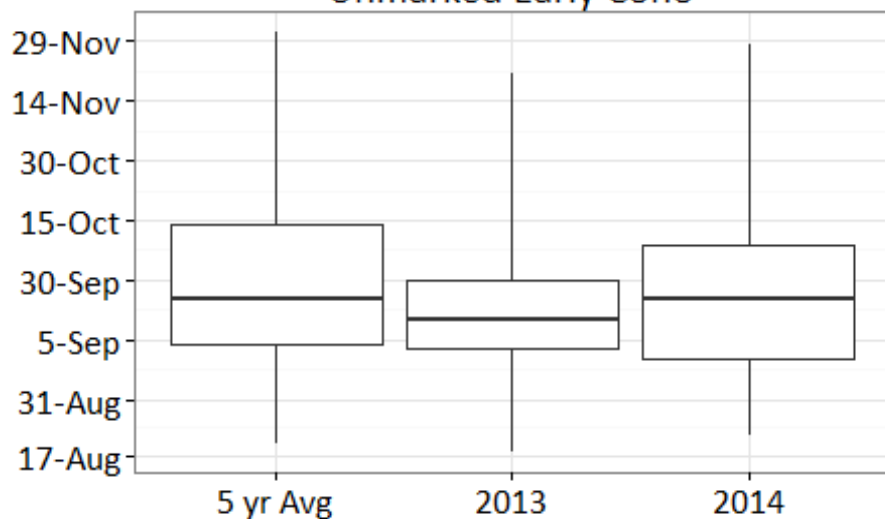
Unmarked CHS



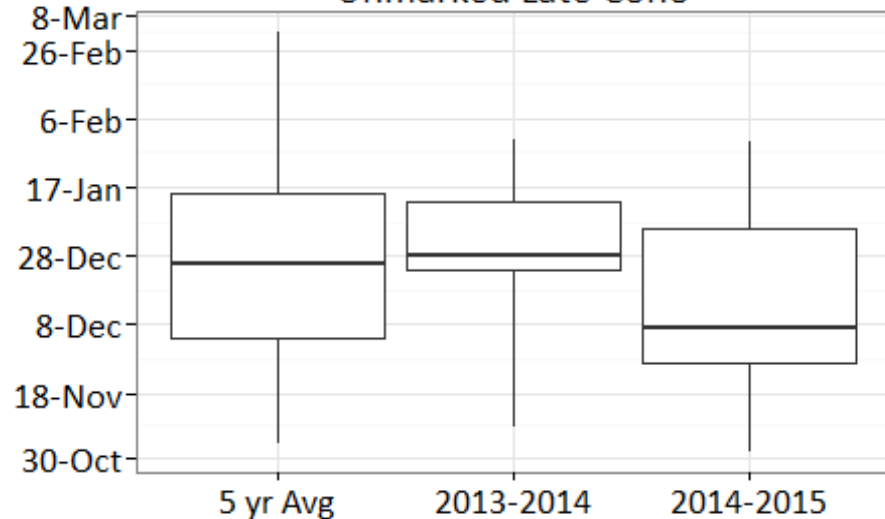
Unmarked WST



Unmarked Early Coho



Unmarked Late Coho



Injury Evaluation

1. Visual observations of “fresh” injuries (n = 14,642)

	Injury Location					
	Head/snout	Opercle	Flank	Caudal	Dorsal	Total
# of Injuries	46	1	14	3	4	68
Injury Rate	0.31%	0.01%	0.10%	0.02%	0.03%	0.46%

- Caveat: Likely a conservative estimate



2014 Upstream Passage Evaluation Results

1. Facility passage rates (facility approach to ladder exit ~0.4 km)
 - STW 97% (n = 35), median passage time 1.46 days
 - CHS 97% (n = 35), median passage time 1.27 days
 - CO 100% (n = 44), median passage time 1.55 days
2. Spawning Ground Distribution
 - STW-Spawning distribution consistent with previous observations
 - CHS-Spawning occurred higher in mainstem relative to 1996-2007 ODFW spawning survey data
 - CO-Absence of spawning survey data

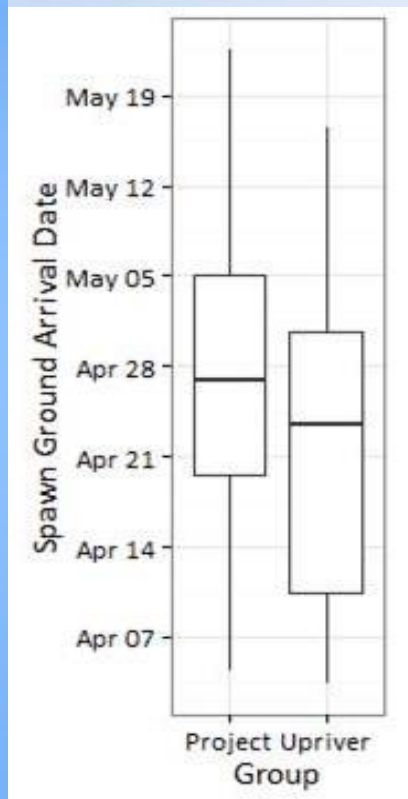


2014 Upstream Passage Evaluation Results

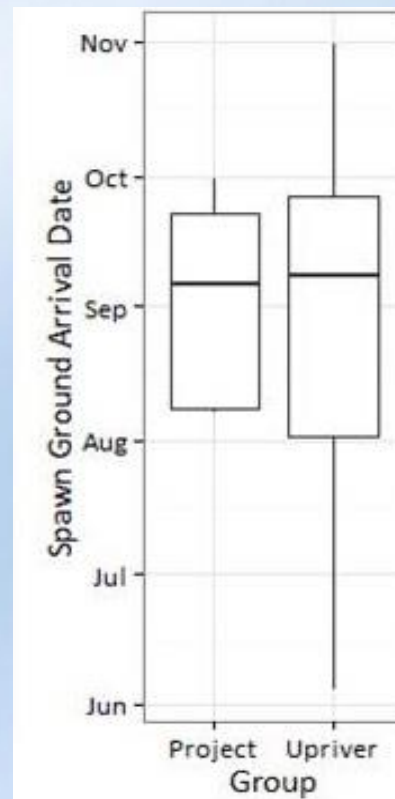
3. Spawning Ground Arrival Date

- STW, CHS, and CO-Project passers not statistically different from fish released upstream of project (Kruskal-Wallis test: $p = 0.32$, $p = 0.93$, and $p = 0.24$).

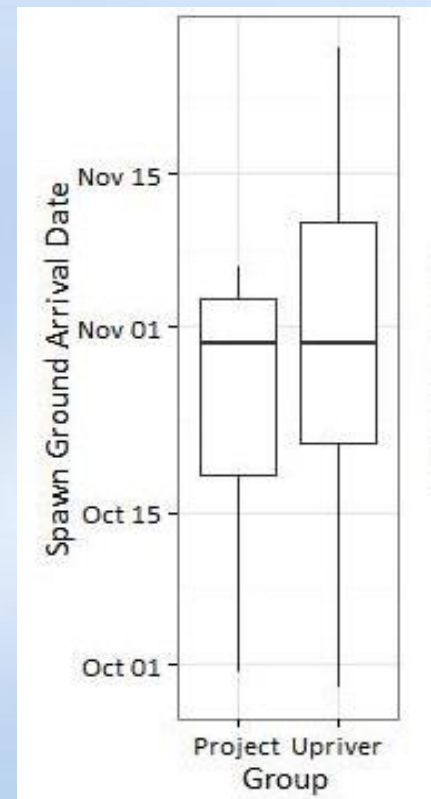
Steelhead



Chinook



Coho



Objectives Satisfied

1. Virtually eliminated physical handling.
2. Reduced “fight or flight” response during sorting.
3. Improved migratory conditions in fish ladder.
4. Advanced CHS and STW run timing?
 - Earlier run timing = increased upstream spawning distribution.



By the Numbers

1. One, the amount of staff required to operate the facility
2. Budgeted cost = 4.1 million, final cost = 5.1 million
3. Sorted 14,790 wild fish from 5,887 hatchery fish
 - 15 different species/origin types
 - Size distribution-150 mm to 1150 mm
4. Average time to determine species/origin = 2 sec per fish
5. Adult lamprey passed upstream
6. Most fish sorted in a day = 562 fish



Ancillary Benefits

1. Union labor/fish transportation cost savings.
 - 78 % decrease in haul days = 403 gal diesel saved.
 - Reduced union labor by 630 hours in calendar year.
2. Reduced the likelihood of a recordable incident.
3. Reduction of impacts associated with segregated hatchery program?





Lessons Learned...

1. A 100% design = 90% design, budget accordingly.
2. What looks good on paper....
3. Operational learning curve
4. What's good for the goose isn't necessarily good for the gander.
 - Species specific passage tendencies.
 - Environmental conditions affect motivation.



Thanks!

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Acknowledgements:

Tim Shibahara

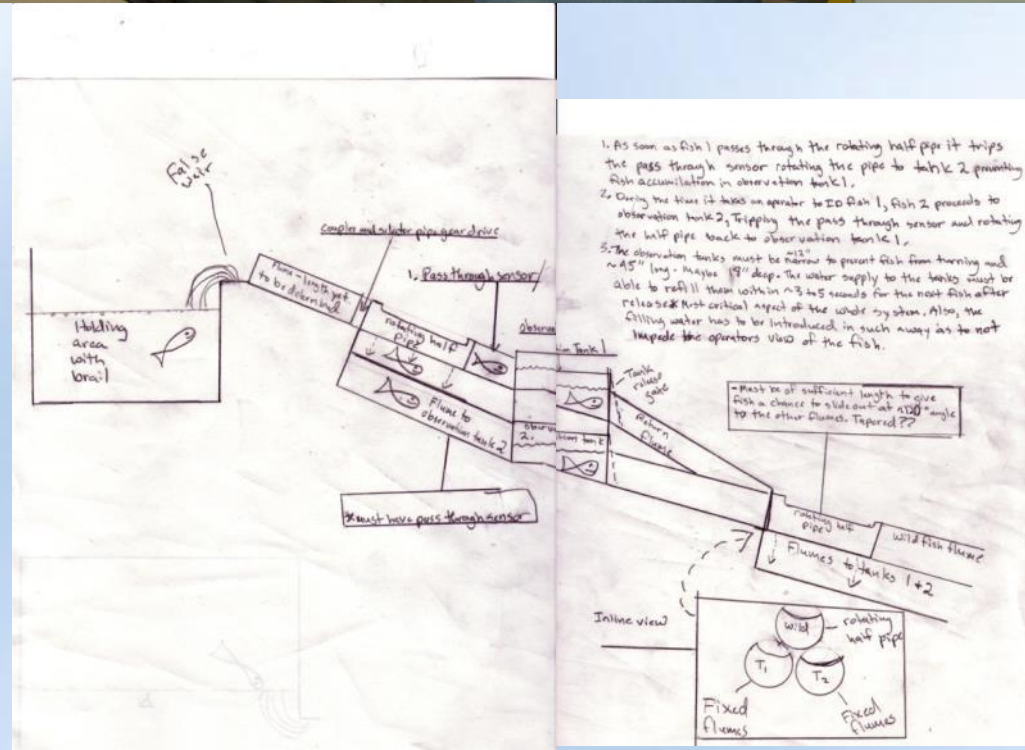
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