

The Use of Passive Integrated Transponder (PIT) Tags as a Tool to Monitor and Manage Adult Chinook Salmon Returns to Idaho

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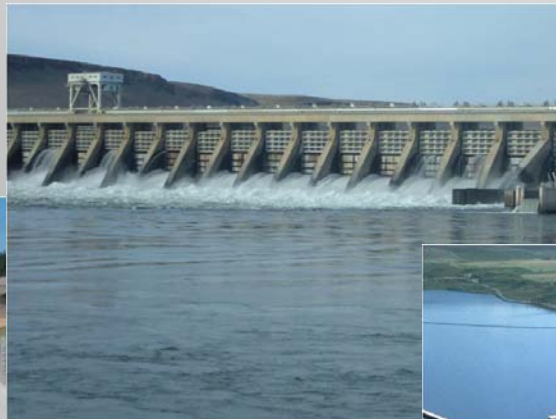
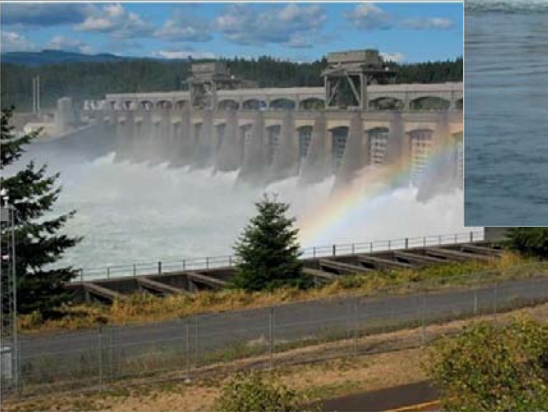
PIT Tagging

- Since 2006, IDFG has been increasing PIT tagging numbers in an effort to have a representative group of tagged fish in each Chinook release

Hatchery	Release Site	BY 2009 # PIT Tagged Chinook
Clearwater	Clear Creek	17,100
	Crooked River	22,200
	Powell Pond	17,100
	Red River	12,000
	Selway River	17,100
McCall	SF Salmon River	52,000
Pahsimeroi	Pahsimeroi River	21,400
Rapid River	Rapid River	52,000
Sawtooth	Upper Salmon River	21,400
Total PITs		232,300

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- Detections of tags in returning fish are used to generate in-season return estimates, by hatchery release site, and age at each dam
- **In addition to the dams, estimates can also be made at any of the growing number of in-stream arrays**

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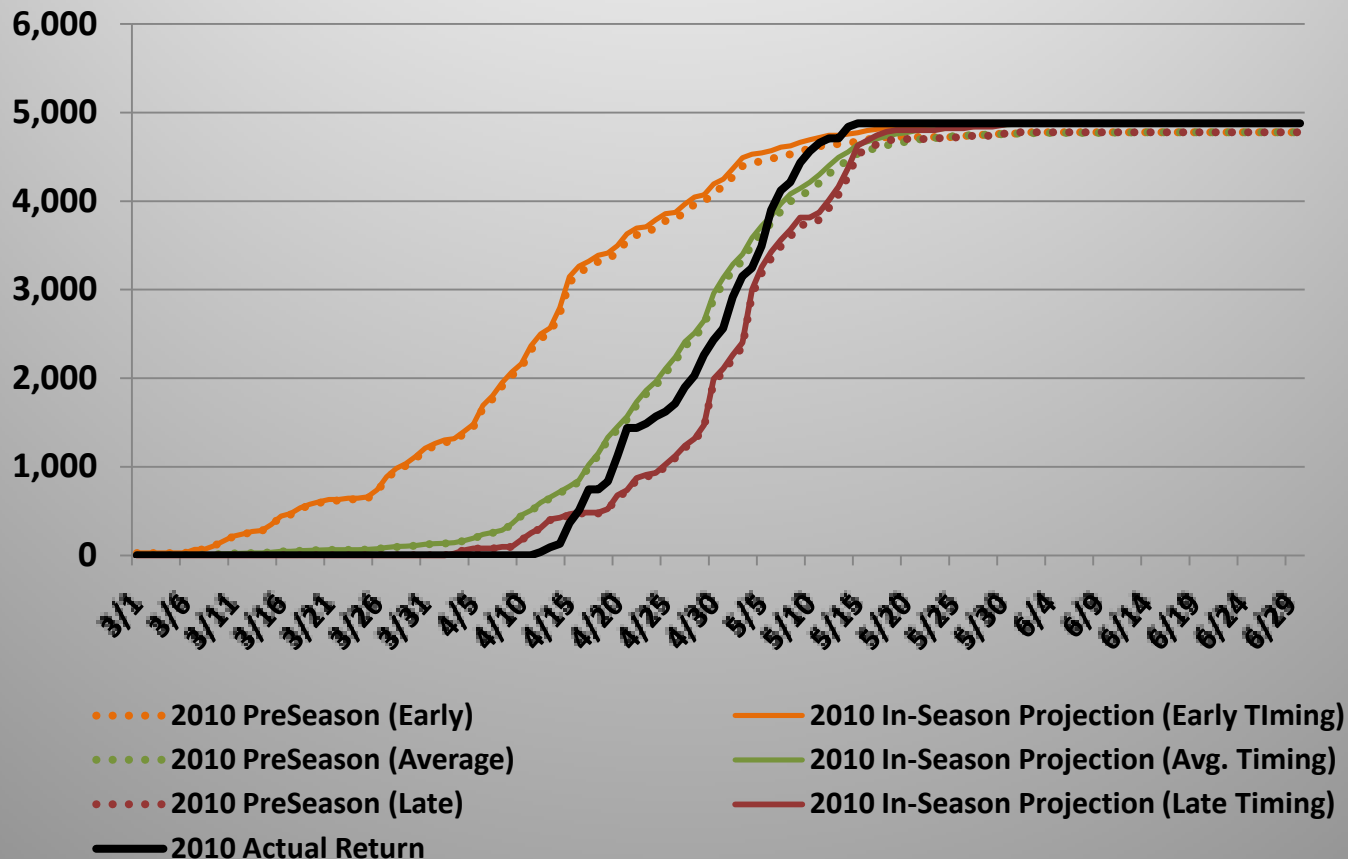
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- Participation typically includes IDFG, ODFW, WDFW, USFWS, NPT, SBT, and IPC
- **This process enables the most up to date in-season estimates to be available for all co-managers and for real time management decisions to be made**

What We Gain

Release Group	2010 Granite Pre-Season Adult Forecast	Final Lower Granite Adult Estimate
Dworshak	8,729	3,735
Kooskia	1,691	3,666
Selway	2,496	1,627
Powell	2,496	729
SF Clearwater	3,726	3,510
Total Clearwater R.	19,138	13,267
Rapid River	76,153	22,038
Sawtooth	1,644	689
Pahsimeroi	9,775	5,051
McCall SFSR	31,755	6,305
Total Salmon R.	119,327	34,082
TOTAL	138,465	47,349

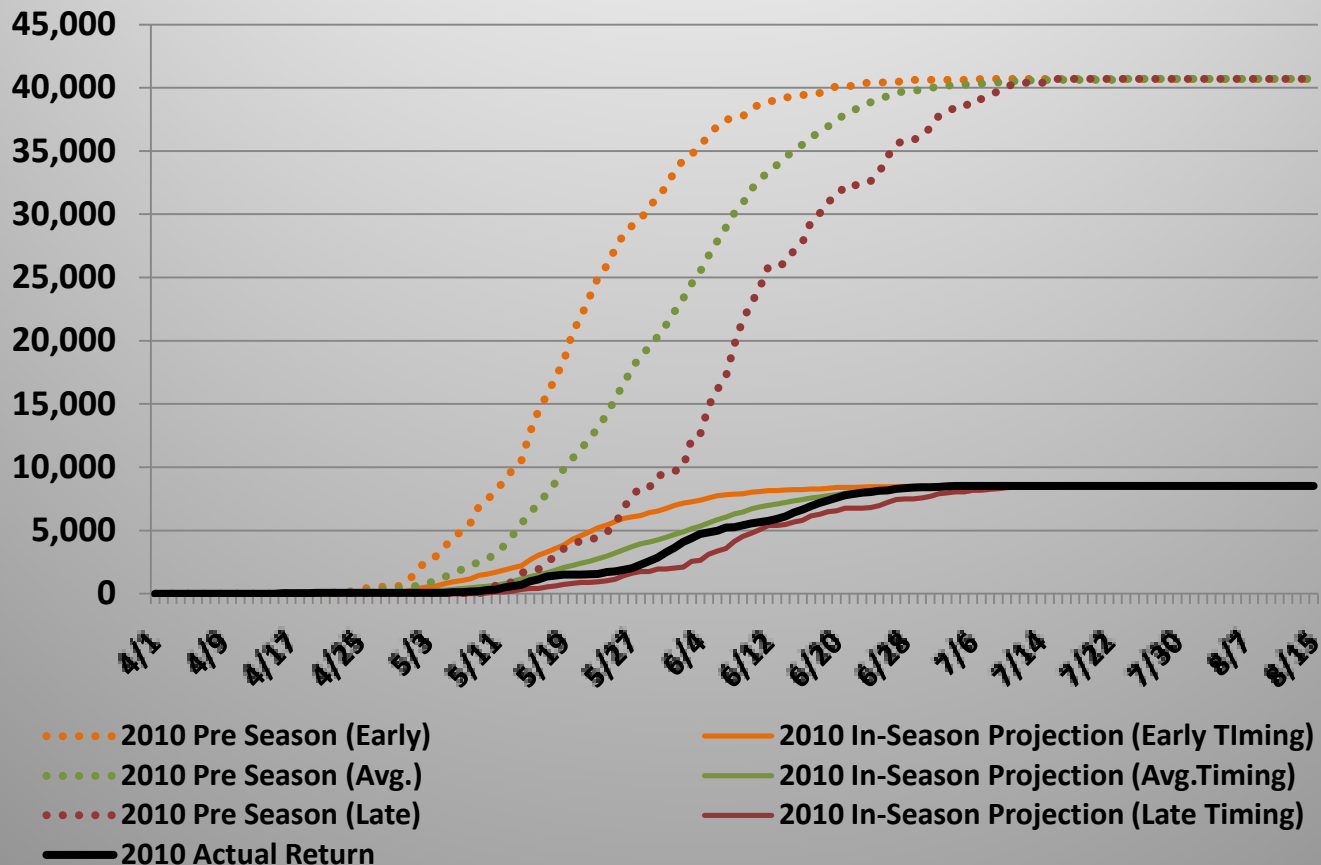
What We Gain

Clearwater Hatchery SOUTH FORK Adults Over Bonn Dam
Historic Timing, In-Season Estimate, and Projected Total Return
Based on Historic PIT Tag Data



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SFSR River Adults Over Bonn Dam
Historic Timing, In-Season Estimate, and Projected Total
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Other Benefits

- **This monitoring also provides more robust stock and age specific data for:**
 - **Inter-dam conversion rates**
 - **Run timing and vulnerability to / availability for downriver fisheries**
 - **Fallback / reascension rates at each dam**
 - **After-hours passage rates at each dam**

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- Tags are shed and there is the possibility for differential survival between tagged and untagged fish resulting in lower representation of tagged fish in the returning population
- **Historically, rates of tagged fish in adults have been difficult to determine because hand scanning at hatchery racks is not 100% efficient**

How are we Addressing Issues?

- To get at true tagged proportions in adult returns, we have installed in-ladder detection arrays at both the SF Salmon River and Sawtooth traps



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2010 SF Salmon River Corrected PIT Expansions at LGD

LOWER GRANITE		Raw Detections		Corrected Detections**		Estimated Number	Original Est. from Juv. Tag Rate
Brood Year	Expansion*	RAL @ LGD	R2R LGD	RAL @ LGD	R2R LGD		
2005	199.0	2	0	2	0	398	62
2006	45.8	214	71	214	71	9,871	6,234
2007	35.7	55	16	55	16	1,977	1,677
						12,246	7,973

* Corrected for Adult PIT tag ratio at Rack

** Corrected for 100% LGD detection efficiency

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 - The level of underestimation appears to vary across years, locations, and between age-classes
- **However, overall hatchery accountability at LGD has been about 80%**

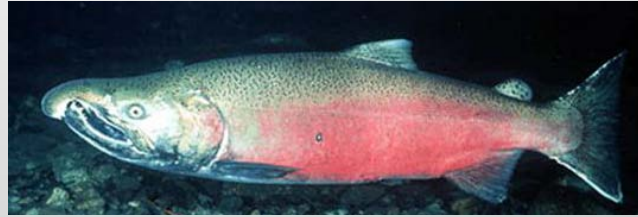
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- **At some facilities, we have started experimenting with a pump array system to get at the true PIT tag number as fish are loaded onto trucks for release to get a better idea of true on station shedding/survival**

How are we Addressing Issues?



- It is our desire to conduct a larger scale double mark study for both Chinook and steelhead at multiple sites across multiple brood years

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- **In-season estimates coupled with weekly conference calls, allow for more accurate and timely management decisions and better multi-agency coordination**

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- PIT tags provide a tool to get real-time, in-season estimates of adult returns at 4 of the 8 lower Columbia and Snake River dams
- In-season estimates coupled with weekly conference calls, allow for more accurate and timely management decisions and better multi-agency coordination
- **While PIT estimates provide a better tool for estimating real-time returns, issues like tag shedding and mortality cause these estimates to be low**

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- PIT tags provide a tool to get real-time, in-season estimates of adult returns at 4 of the 8 lower Columbia and Snake River dams
- In-season estimates coupled with weekly conference calls, allow for more accurate and timely management decisions and better multi-agency coordination
- While PIT estimates provide a better tool for estimating real-time returns, issues like tag shedding and mortality cause these estimates to be low
- **We are, and will continue to be, analyzing the rates at which PIT tagged adults return and what causes the differential return rates in hopes that estimates could be corrected in-season, rather than post season**

Acknowledgements

- LSRCP
- PSMFC Mark Crew
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- Biomark

Questions?

