

# TELEMETRY APPLICATIONS IN THE OKANAGAN, BRITISH COLUMBIA, CANADA

S. Folks<sup>1</sup>, R. Bussanich<sup>1</sup>, K. Hyatt<sup>2</sup>, J. Fryer<sup>3</sup>, R. Benson<sup>1</sup>, A. Stevens<sup>1</sup>, J. Miller<sup>4</sup>, H. Wright<sup>1</sup>  
<sup>1</sup>Okanagan Nation Alliance, Westbank BC; <sup>2</sup>Department of Fisheries and Oceans Canada, Nanaimo BC; <sup>3</sup> Columbia River Inter-Tribal Fish Commission, Portland, OR; <sup>4</sup> Colville Confederated Tribes, Omak WA.

## MULTI AGENCY COLLABORATION

Since 2009 ONA, DFO, CRITFC, and the CCT have engaged in a study to determine the limiting factors affecting the abundance of Okanagan River Sockeye.  
Key **research questions** include:

1. What are the freshwater habitat and in-lake rearing limitations?
2. What are freshwater outmigration issues?
3. What are freshwater adult return migration issues?
4. What are other influences? Such as Harvest?

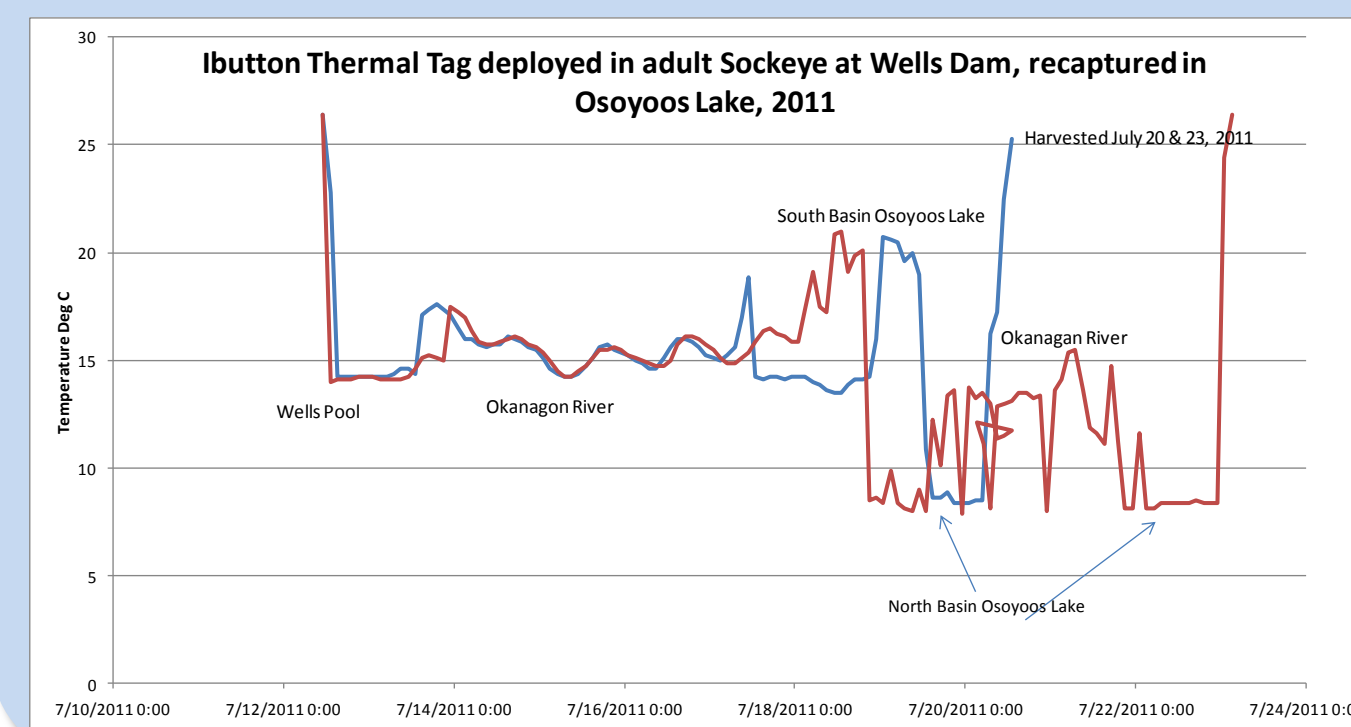
## KEY LESSONS

Temperature to play a key role in both the Okanagan River and Osoyoos Lake. SAR's will be possible. Wenatchee Lake ~63% as productive as Osoyoos Lake.



## HABITAT

- Thermal refuge and Temperature**
- Temperature tagged sockeye at Wells Dam (2010, 2011, 2013, 2014)
  - Acoustic tagged sockeye with Temperature & Pressure tags
  - In-Lake rearing assessments via ATS & Limnology surveys
  - South Basin of Osoyoos Lake poses migratory challenge – thermally.



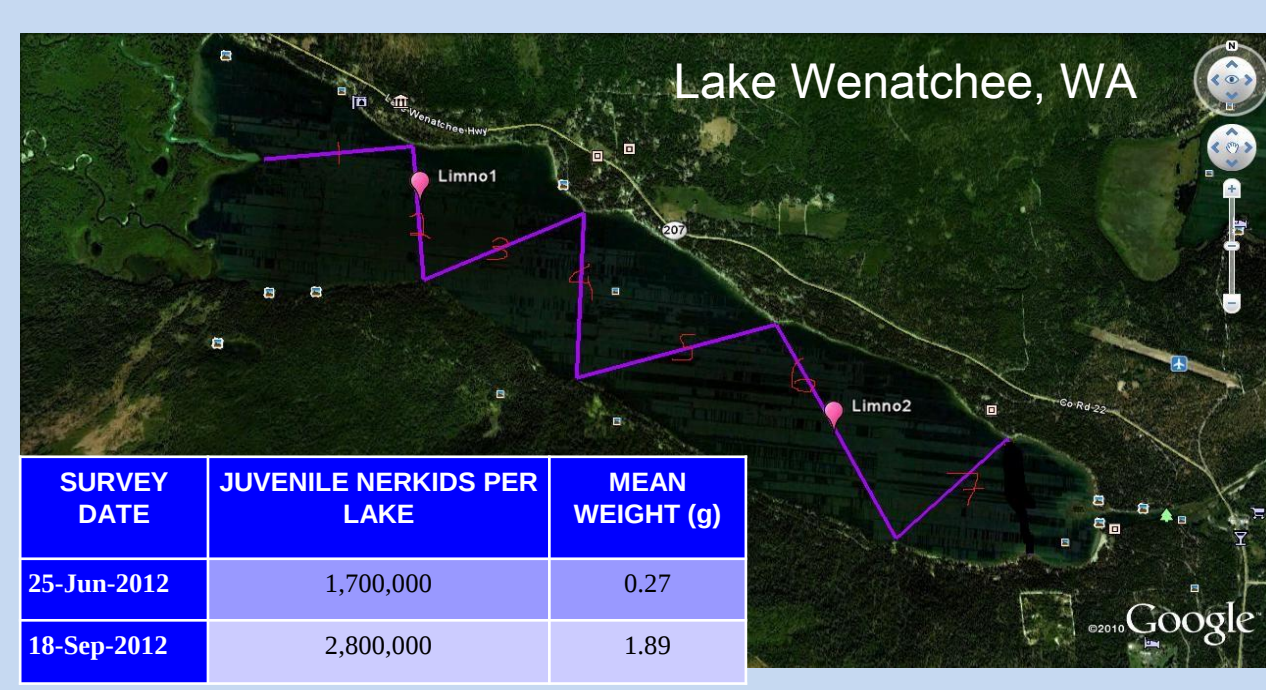
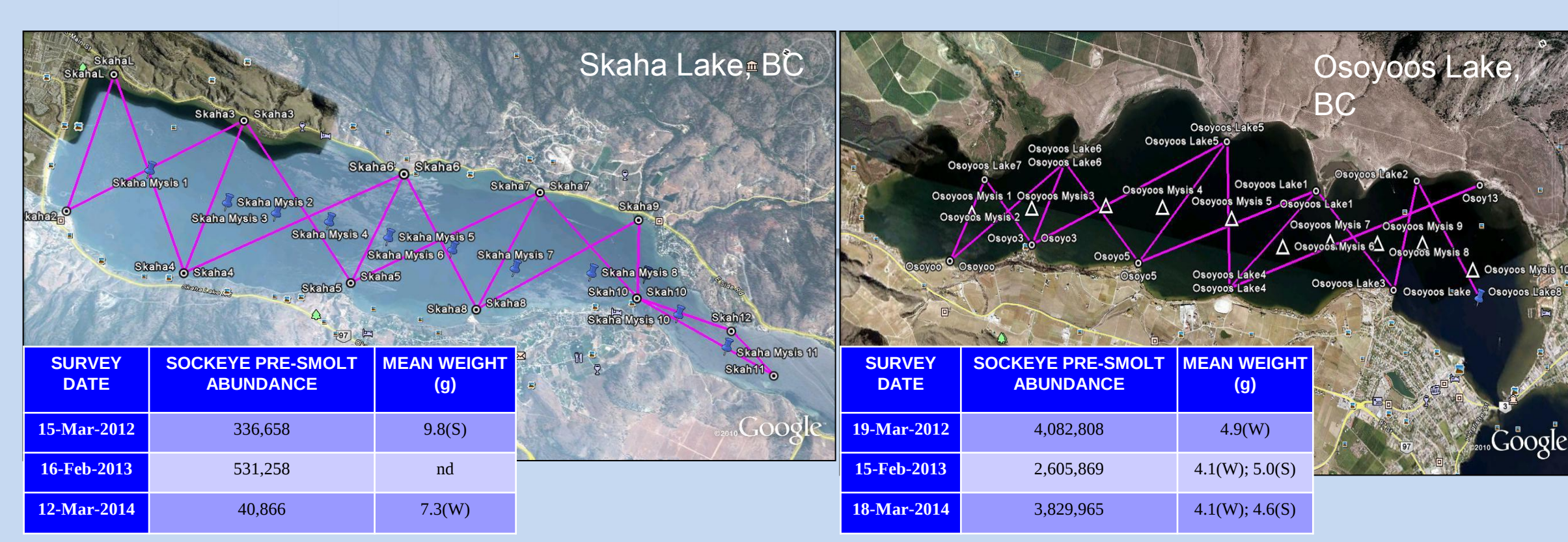
*Mission:*  
*To determine limiting factors affecting the abundance of Okanagan River Sockeye*

## FISH BEHAVIOUR

- Acoustic tagged sockeye at Wells Dam in all years of study
- Mobile tracked Sockeye as they enter Osoyoos Lake and in river on spawning grounds
- Harvest decision rules in tandem with temperature profiles. Harvest halted in 2011 based on acoustic estimates of sockeye in Osoyoos Lake & temperature squeeze
- PIT tagged adults at Wells Dam

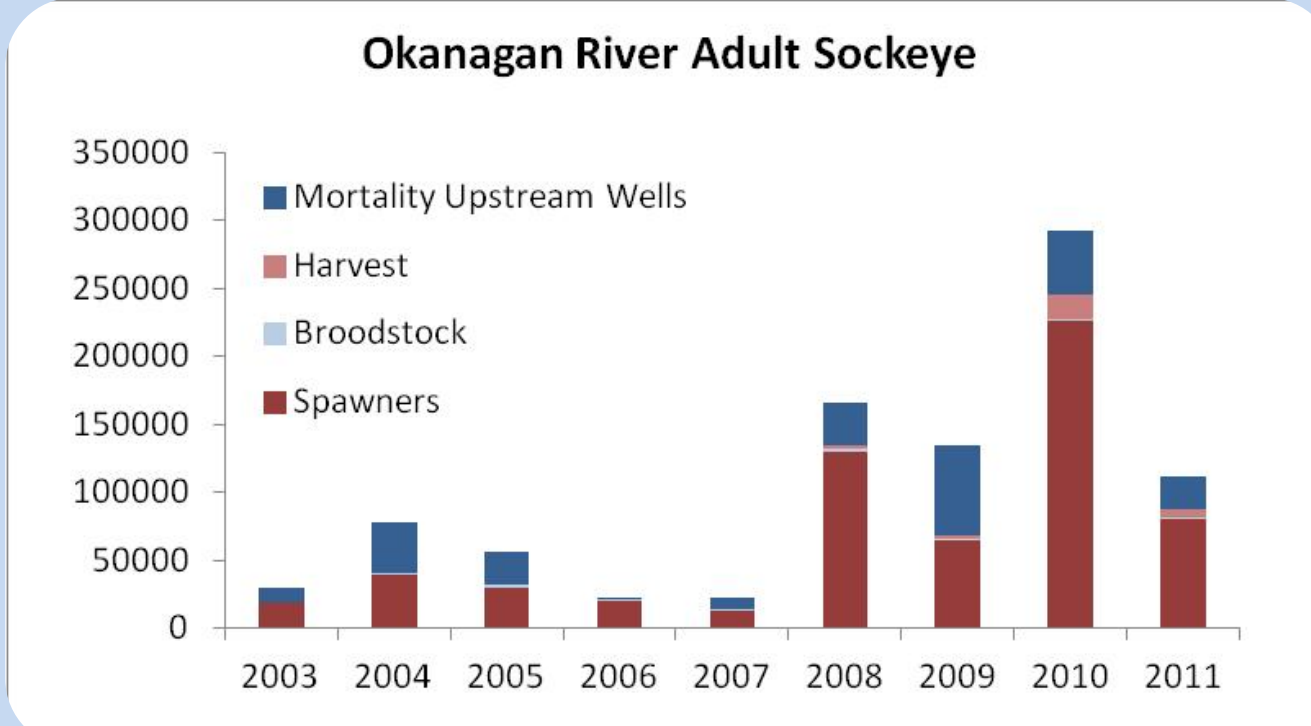
## ABUNDANCE

- ONA commenced PIT tagging smolts to better understand the freshwater outmigration and work to build SAR's.
- Smolt survival to RRH; 2012 0.53, 2013 0.48, 2014 0.515. Survival estimates to lower in Columbia warrants more study.
- OKC only terminal spawning area PIT array. Detection efficiencies determined by PIT & Acoustic tags



## PRODUCTIVITY

Monitor juvenile and adult sockeye and kokanee, phytoplankton, zooplankton, Mysid shrimp, water quality, and bioenergetics.



### SOME SURVIVAL UNCERTAINTIES

- |                                                                                                                                                                       |                                                                                                                                                                                                       |                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Freshwater: Summer – Fall</b> <ul style="list-style-type: none"><li>• Low flow</li><li>• Cold water refuge</li><li>• Degraded habitat</li><li>• Poaching</li></ul> | <b>Freshwater: Winter - Spring</b> <ul style="list-style-type: none"><li>• Low/High flows</li><li>• Predation</li><li>• Entrainment</li><li>• Degraded habitat</li><li>• Non-native species</li></ul> | <b>Ocean (1 – 3 years)</b> <ul style="list-style-type: none"><li>• Columbia Flows</li><li>• Coastal upwelling (temp. and prey)</li><li>• Harvest</li><li>• Predation</li></ul> |
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## Project History

- PIT detection at McIntyre & Skaha Dams
- Paleolimnology studies of Osoyoos, Skaha, & Wenatchee Lakes
- Fish passage at Skaha Dam
- ONA deploys 5056 Sockeye Smolt PIT tags from SKATAL and OSOYOL
- ONA deploys 4018 Sockeye Smolt PIT tags from SKATAL and OSOYOL
- ONA trials implementation of PIT tagging smolts. 544 tags released from SKATAL & OSOYOL
- Fish passage at McIntyre Dam
- Fall - OKC mainstem PIT array installed
- Summer acoustic tags deployed by CCT & CRITFC at Wells Dam
- Initiated by CRITFC. ONA-CRITFC - DFO engage in project planning

2015  
2015  
2014  
2014  
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2012  
2009  
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