



Sockeye Salmon Re-introduction and Restoration in the Okanagan Basin

PSC Seminar Series - COLUMBIA RIVER BASIN SALMON RESTORATION
Presented by Chad Fuller

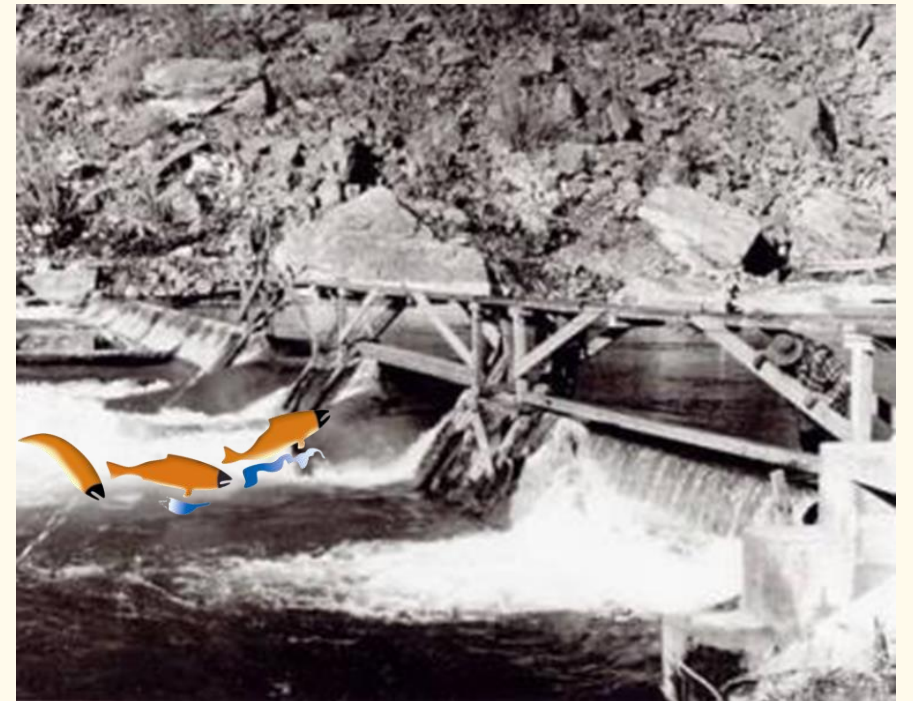
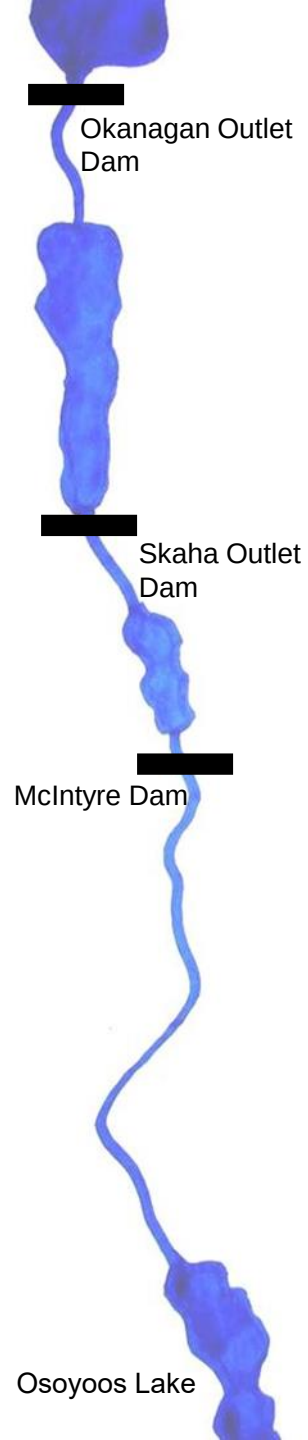


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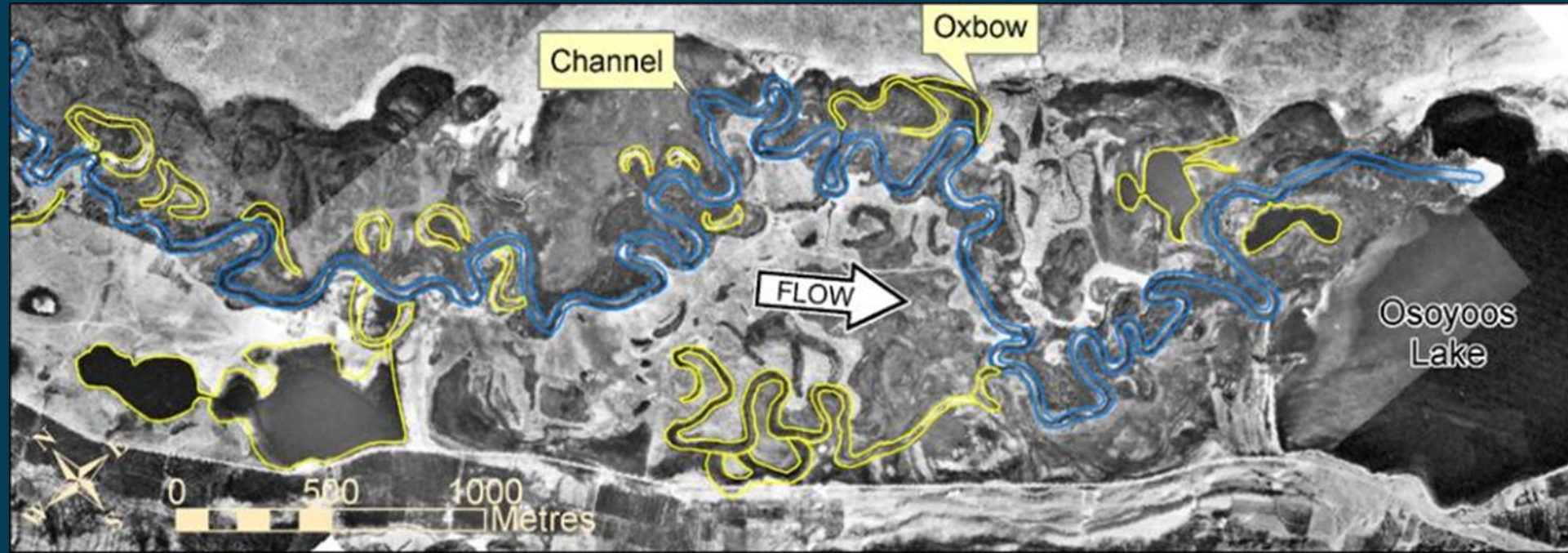


VALLEY CHANGES

- Dams & channelization
- Channel length halved
- Wetland area reduced 88%
- Habitat greatly simplified
- Indigenous fish species reduced



Valley Changes

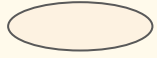


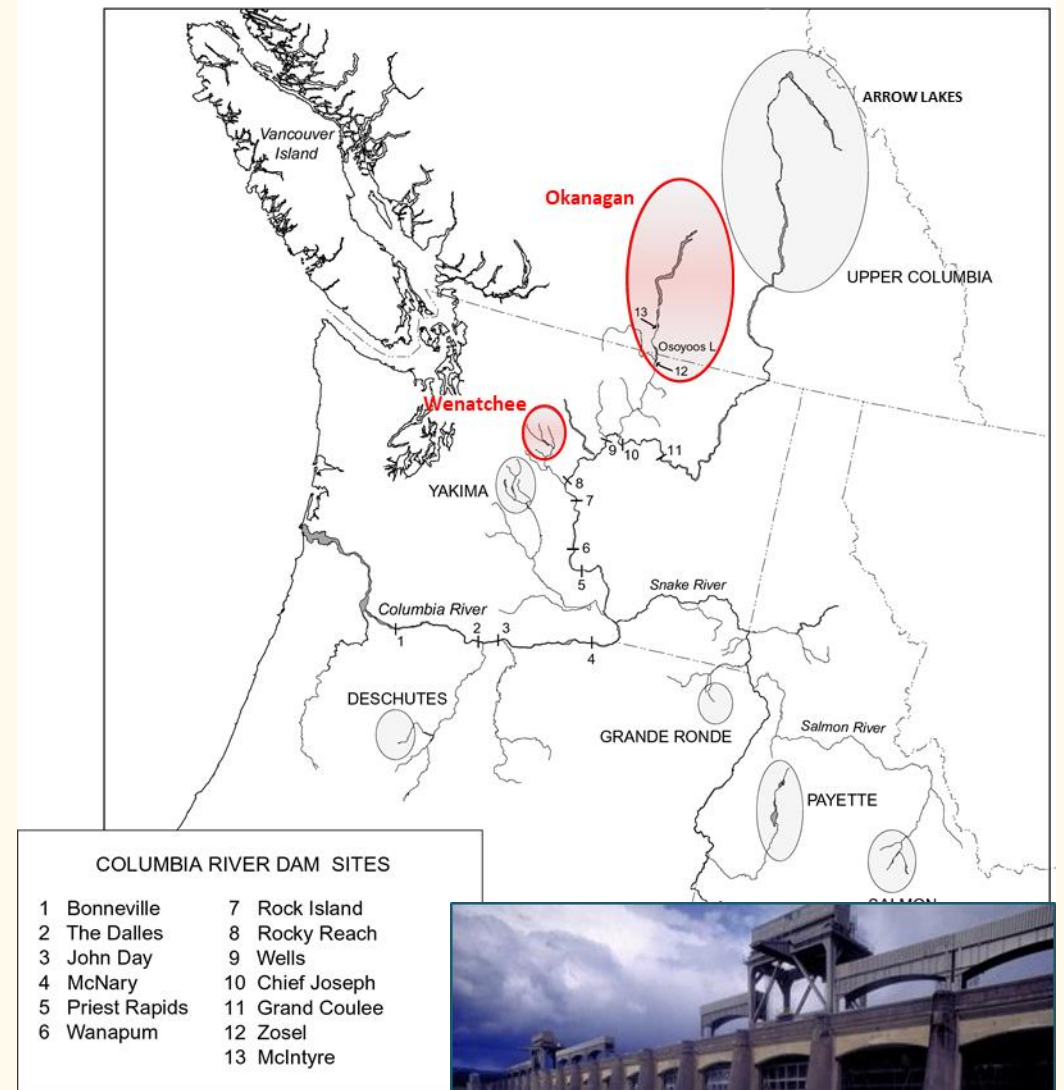


BACKGROUND

- Okanagan Sockeye population is one of two viable Columbia River stocks



-  Historically accessible to sockeye
-  Present day viable sockeye populations



1200 km and 9 major dams to get to Okanagan River



SALMON INTEGRAL TO OKANAGAN CULTURE

How Senk'lip Brought Salmon to the People

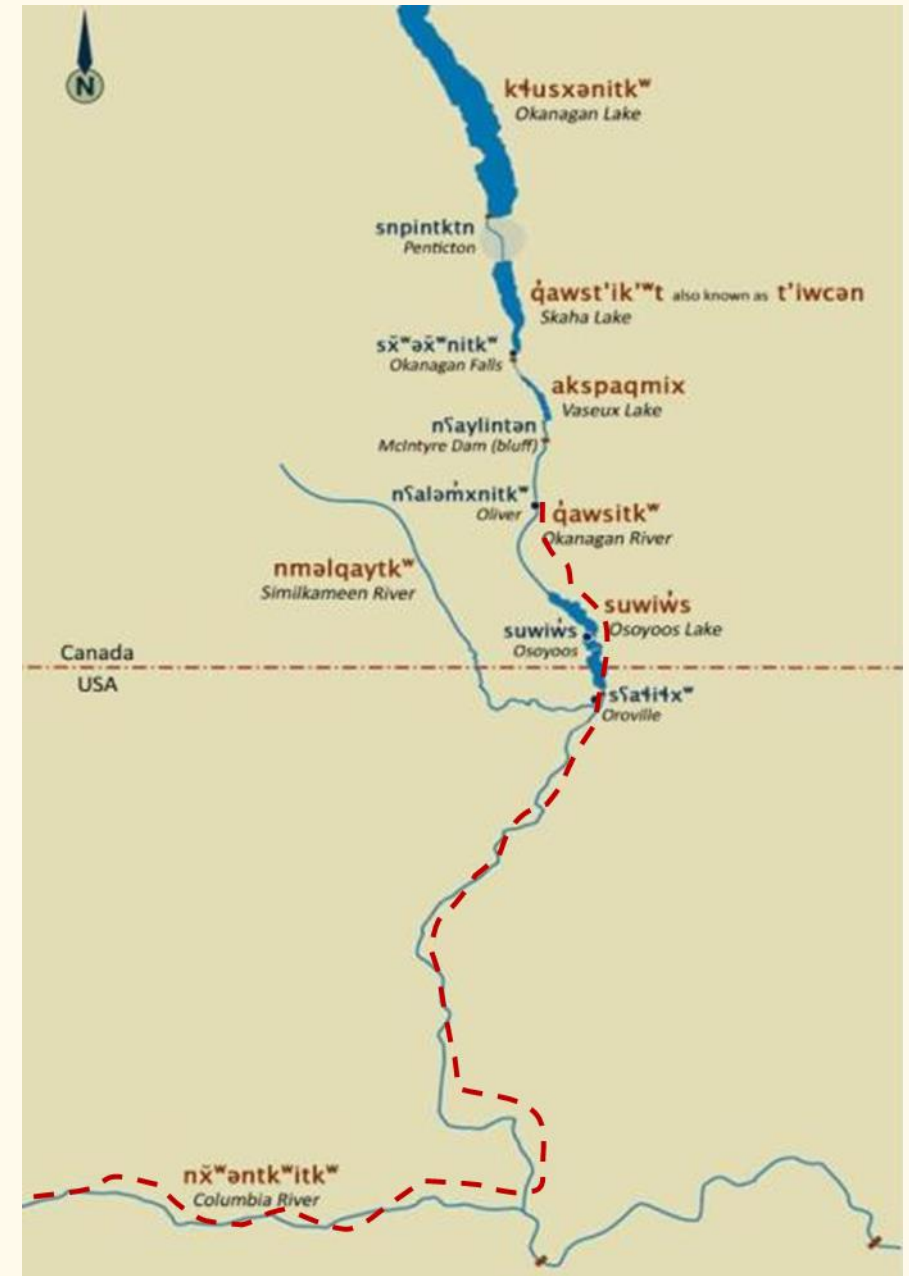


- Knowledge passed down through captik^{wł} Stories are a record of Okanagan history
- Coyote's travels are a record of natural laws
- Brought salmon to the Columbia and tributaries

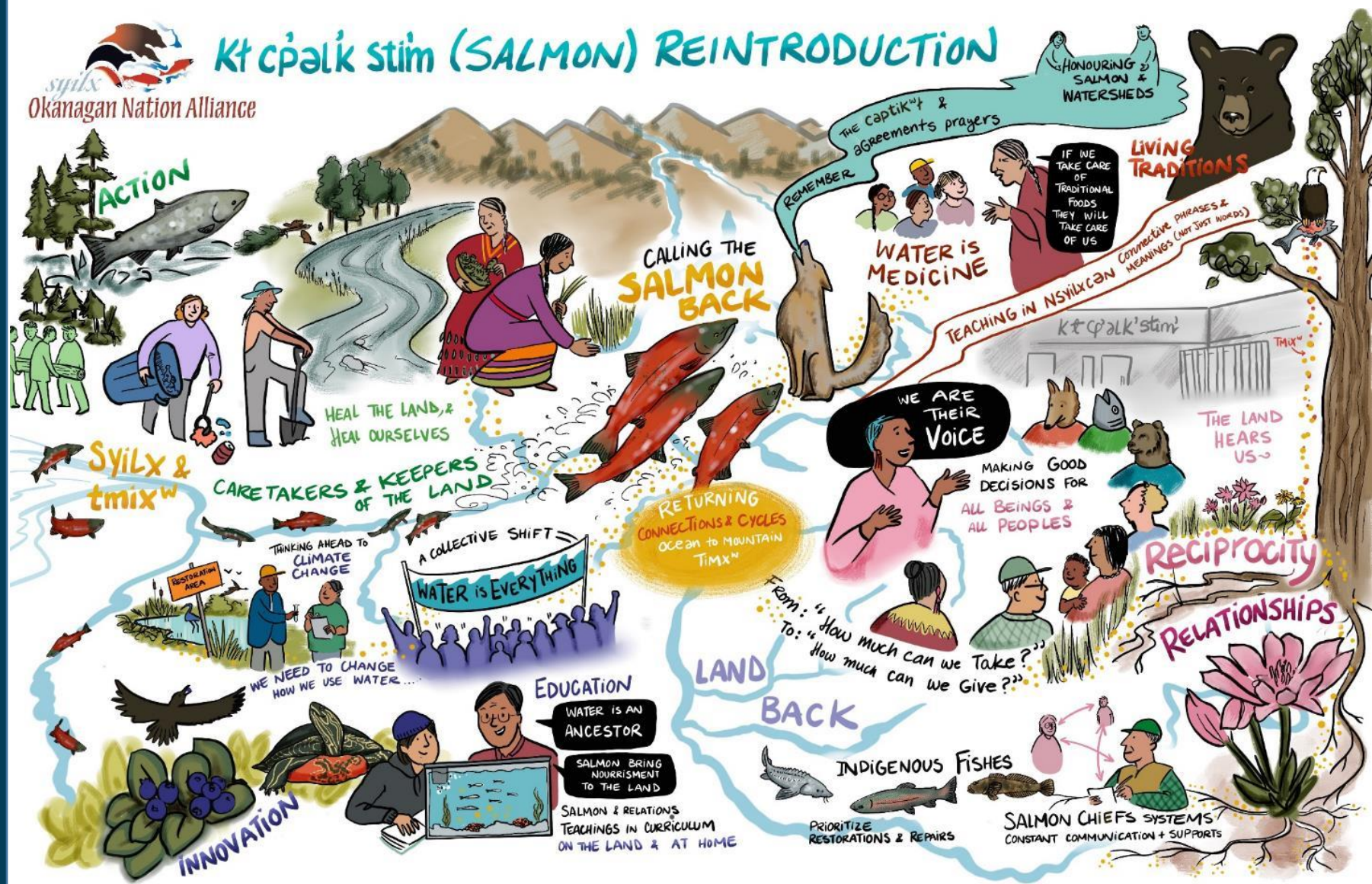
captikʷ



1. Fish passage lost
2. Indigenous fish habitat lost



Put the river back
Put the fish back
Put the people back



PUT THE FISH BACK

Passage



1. McIntyre Dam modify 2009
2. Skaha Dam ladder 2014
3. Shingle Dam decommission 2014
4. Shuttleworth Creek weir removal 2015
5. Ellis Creek weir removal 2018
6. Okanagan Lake passage 2019 – present

PUT THE FISH BACK

Re-introduction of Sockeye into Skaha Lake



- Initiated in 1990's
- Discussed via Canadian Okanagan Basin Technical Working Group
- Risk assessment (1999 – 2003)
- Experimental Reintroduction Program (2004-2016)
- Continued discussion and adaptively managed



SOCKEYE RESTORATION



BRITISH
COLUMBIA

Ministry of
Water, Land and
Resource Stewardship



Fisheries and Oceans
Canada

Pêches et Océans
Canada



CHELAN COUNTY



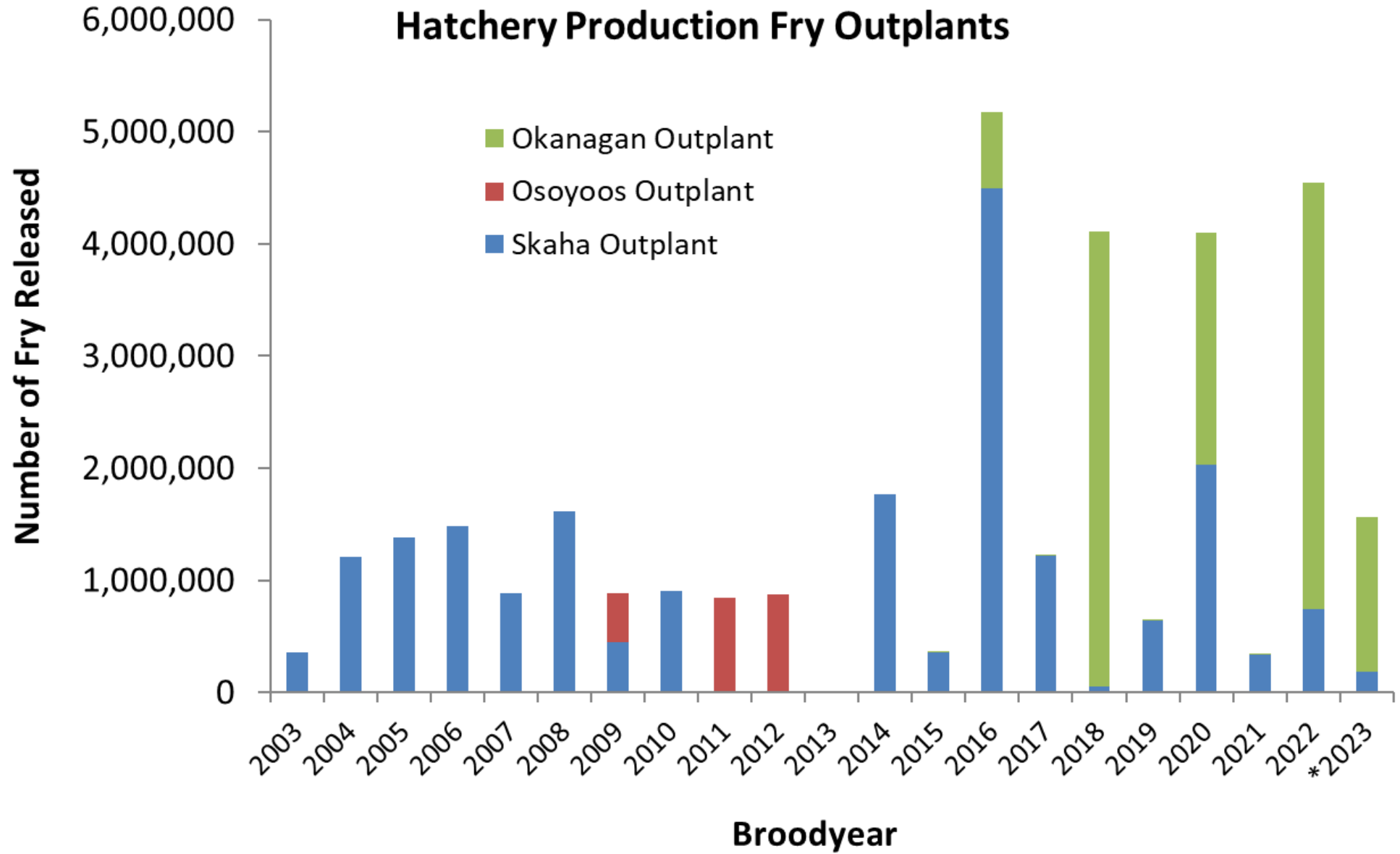
kł cp'əlk' stim' Hatchery: Nation owned



PUT THE FISH BACK



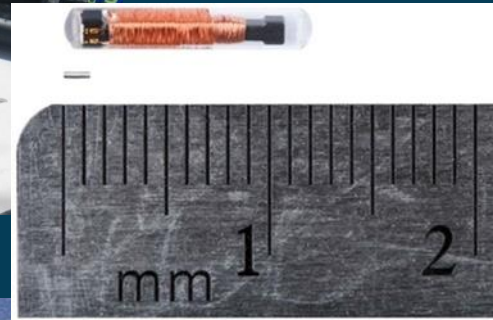
1. 2003: Start sockeye fry production & 12-year Skaha Lake re-introduction experiment
2. 2009: McIntyre Dam (migration barrier) fish passage provided
3. 2014: Skaha Dam fish passage provided
4. 2017: Sockeye hatchery fry outplants into Okanagan Lake
5. 2019: Okanagan Dam fishway activated and monitored



Monitoring and Evaluation

Intensive monitoring:

- Temperature/ DO
- Phytoplankton
- Zooplankton
- Mysis shrimp
- Acoustic Trawl Survey (SK and KO)
- PIT tagging (Survival, travel time, smolt-adult ratios)
- Adult return data
- Genetics



Osoyoos Lake Water Quality Monitoring

North Basin

Depth Profiles: Temperature and Dissolved Oxygen

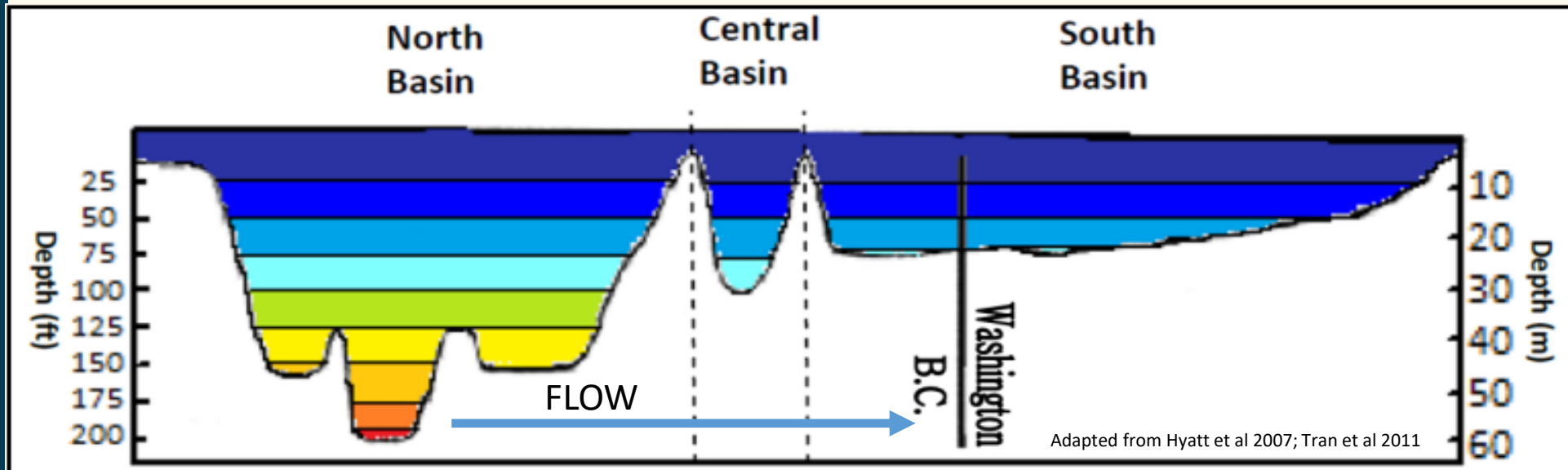
Nutrients: Total Nitrogen, Total Phosphorous, Total Kjeldahl Nitrogen, Nitrate as N,
Chlorophyll *a*

Timing

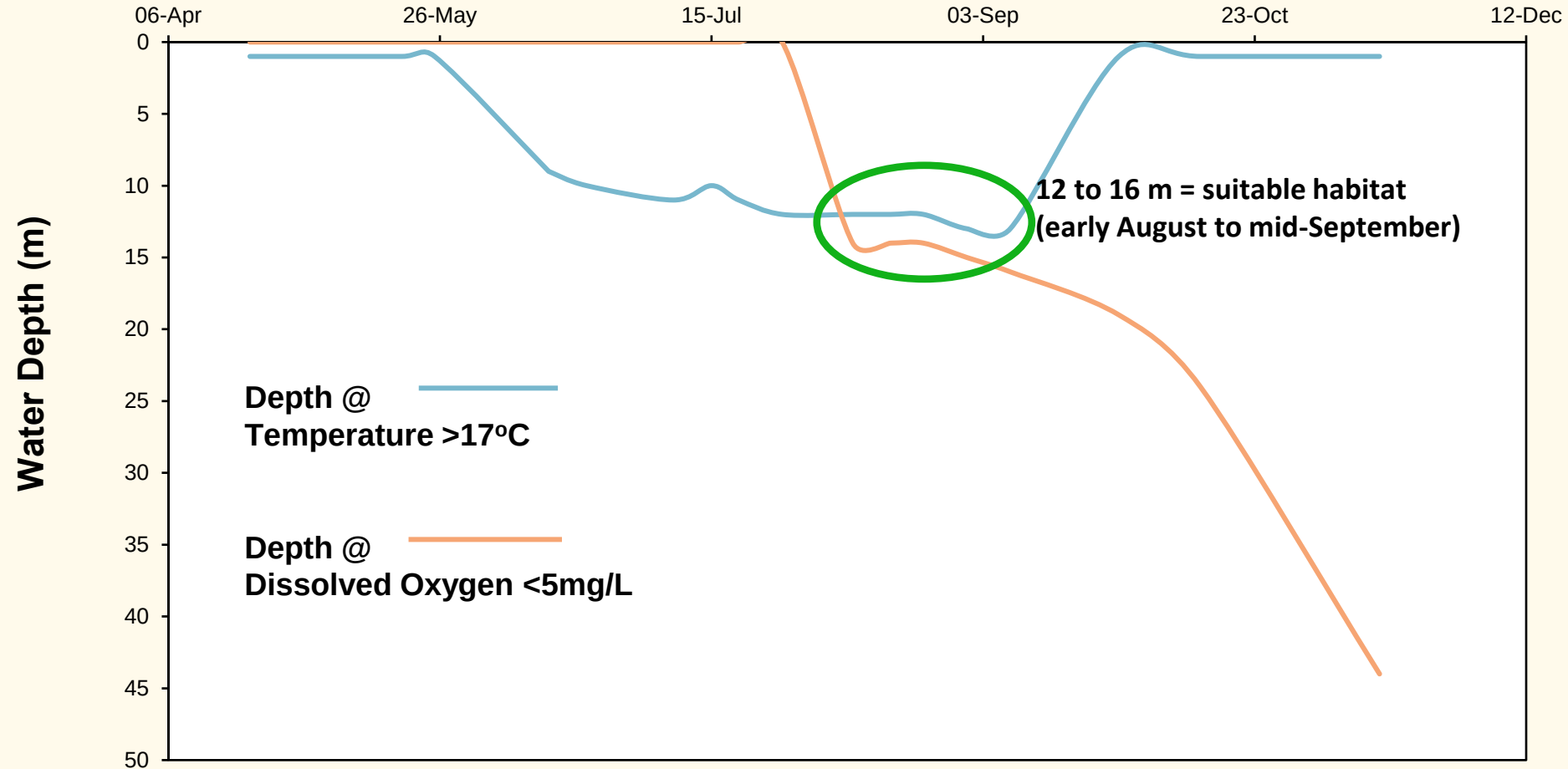
2005 to 2017 May - October

2020 May-October (Temp/DO); June, August, October (Nutrients)

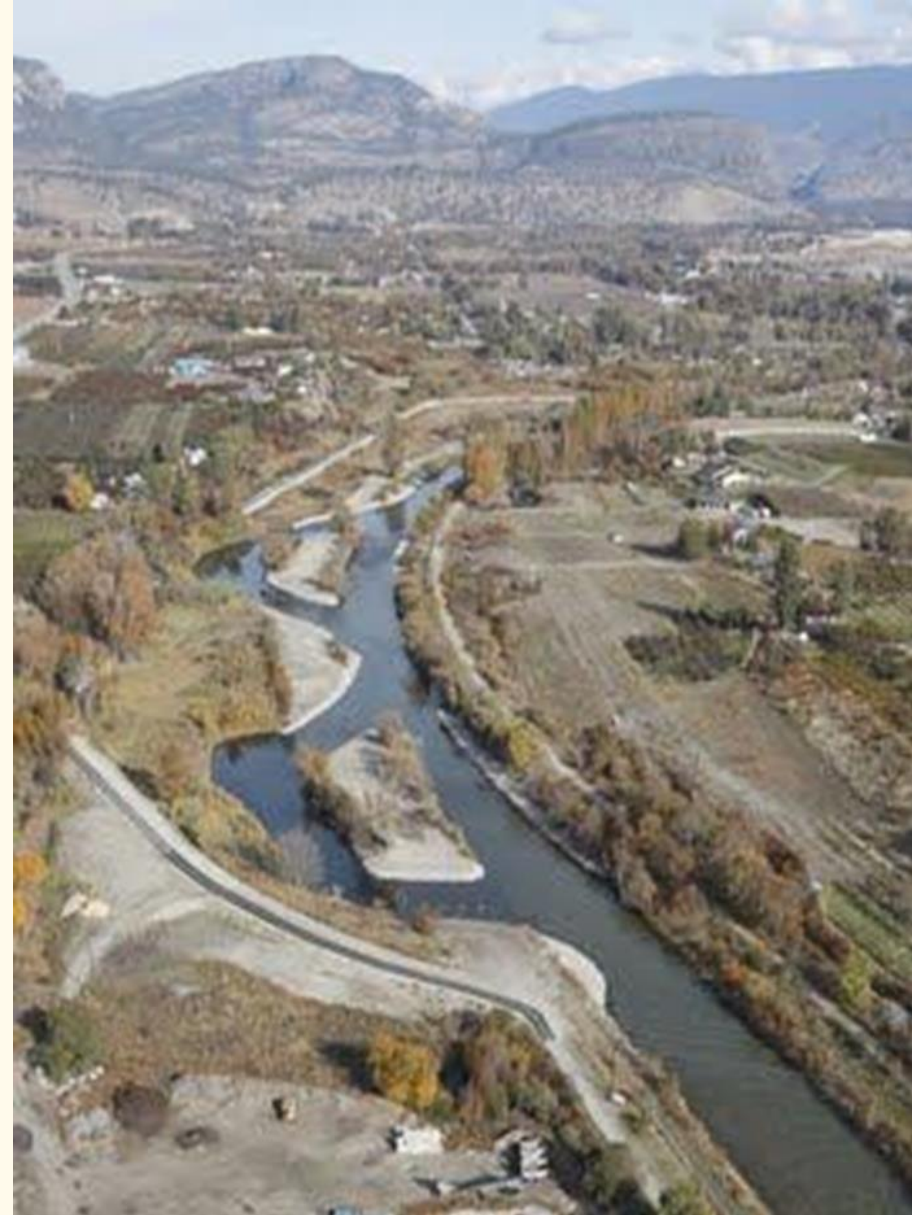
2022- May – November (Temp/DO); May and August (Nutrients)



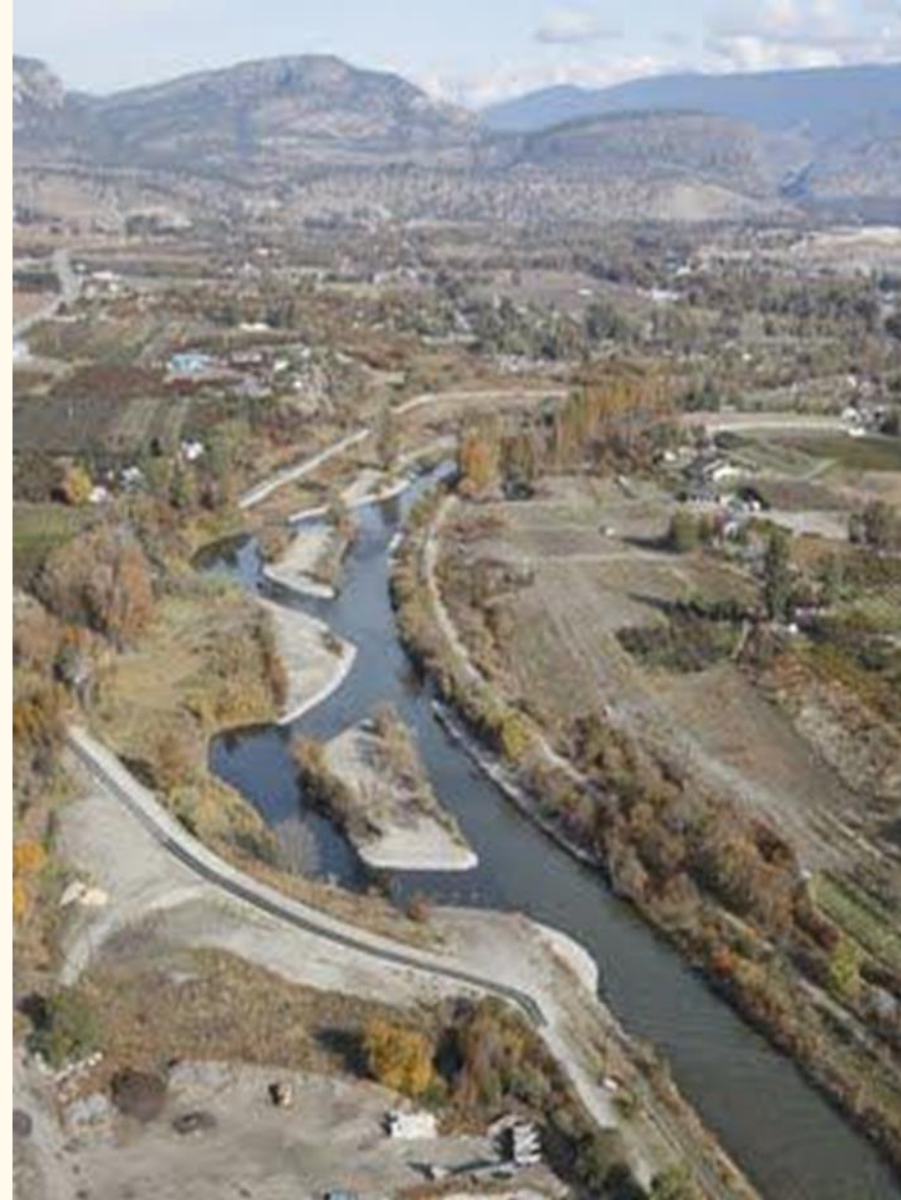
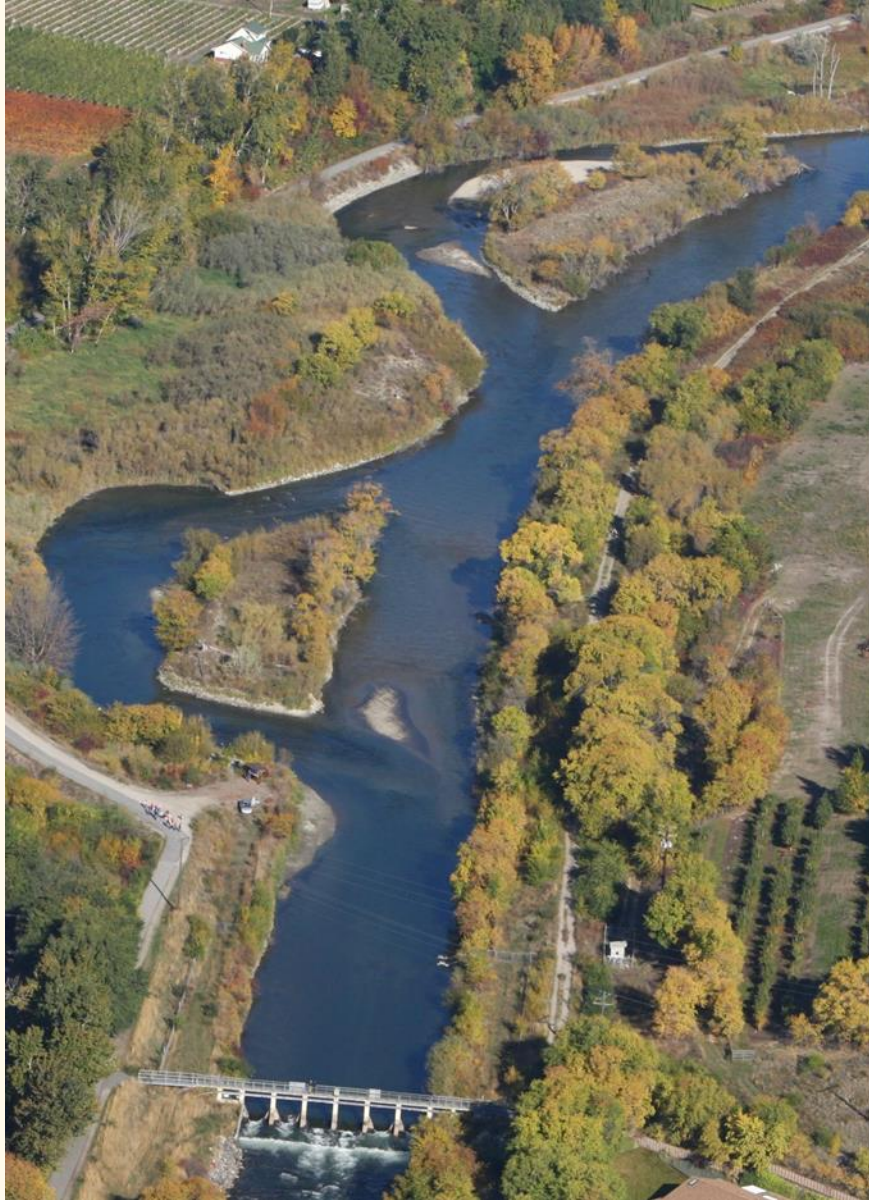
Osoyoos Lake Temperature - Dissolved Oxygen Squeeze



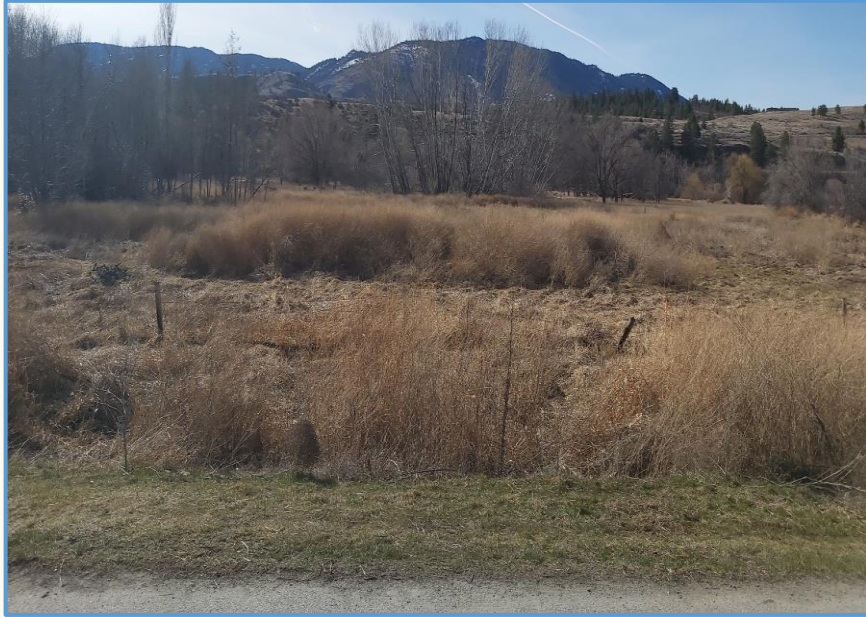
PUT THE RIVER BACK



PUT THE RIVER BACK



PUT THE RIVER BACK



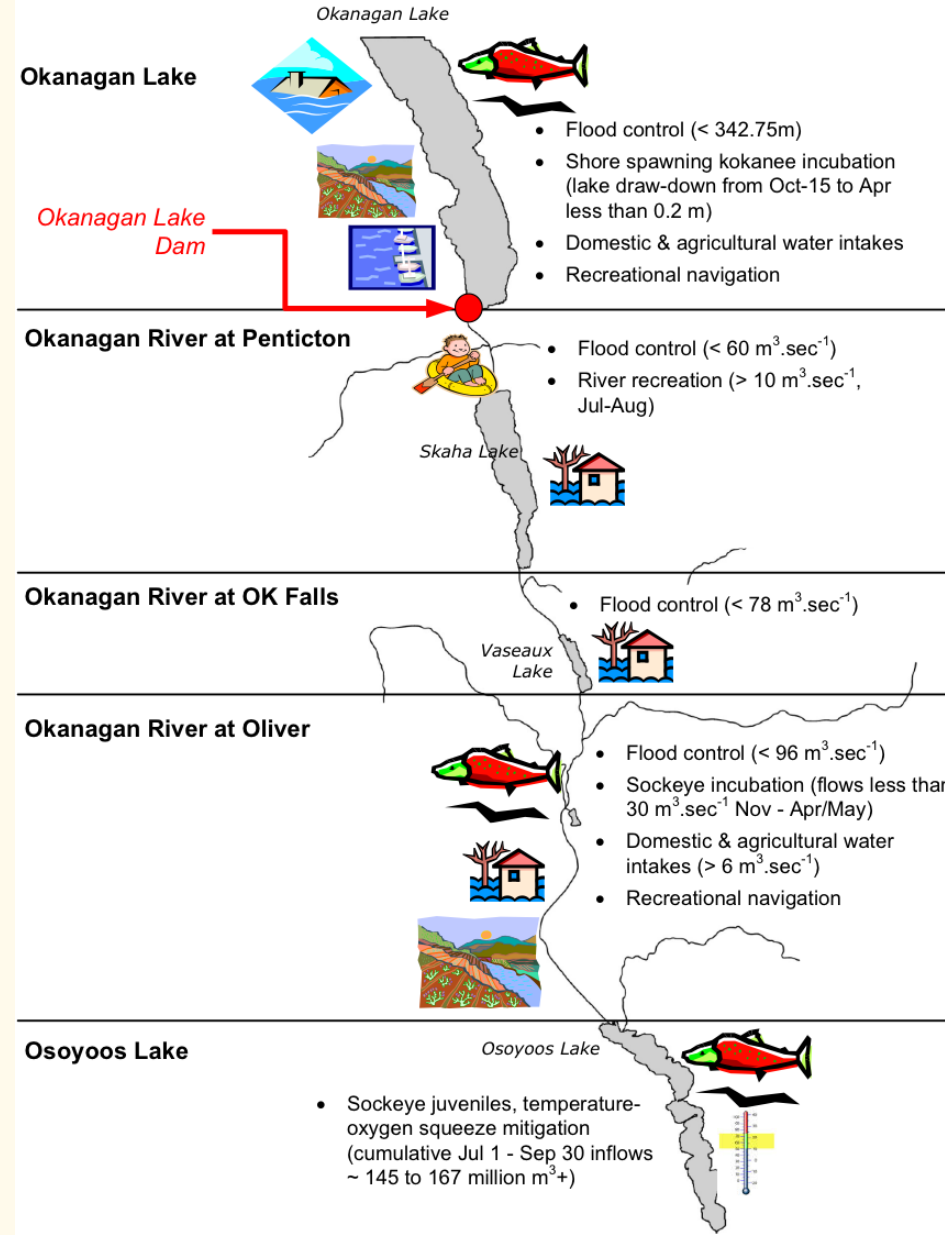
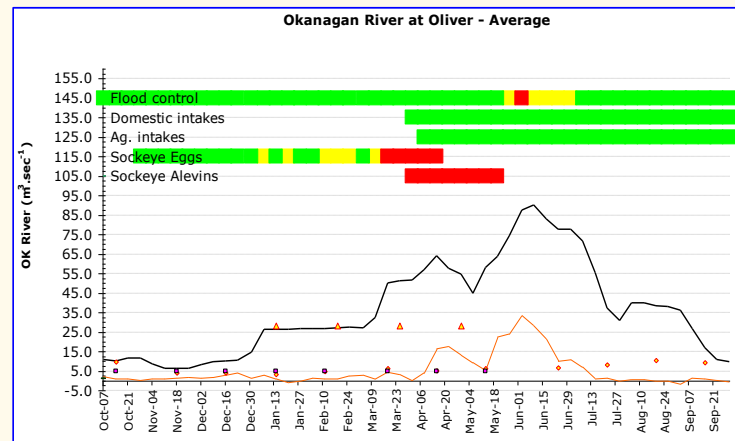
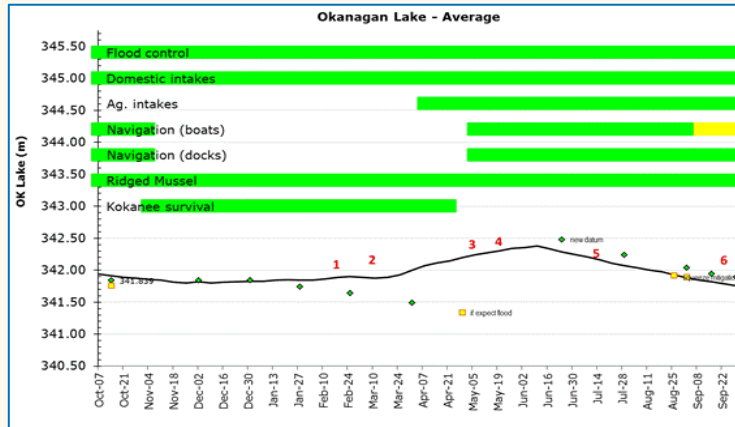
PUT THE RIVER BACK

Fish-water Management Tool

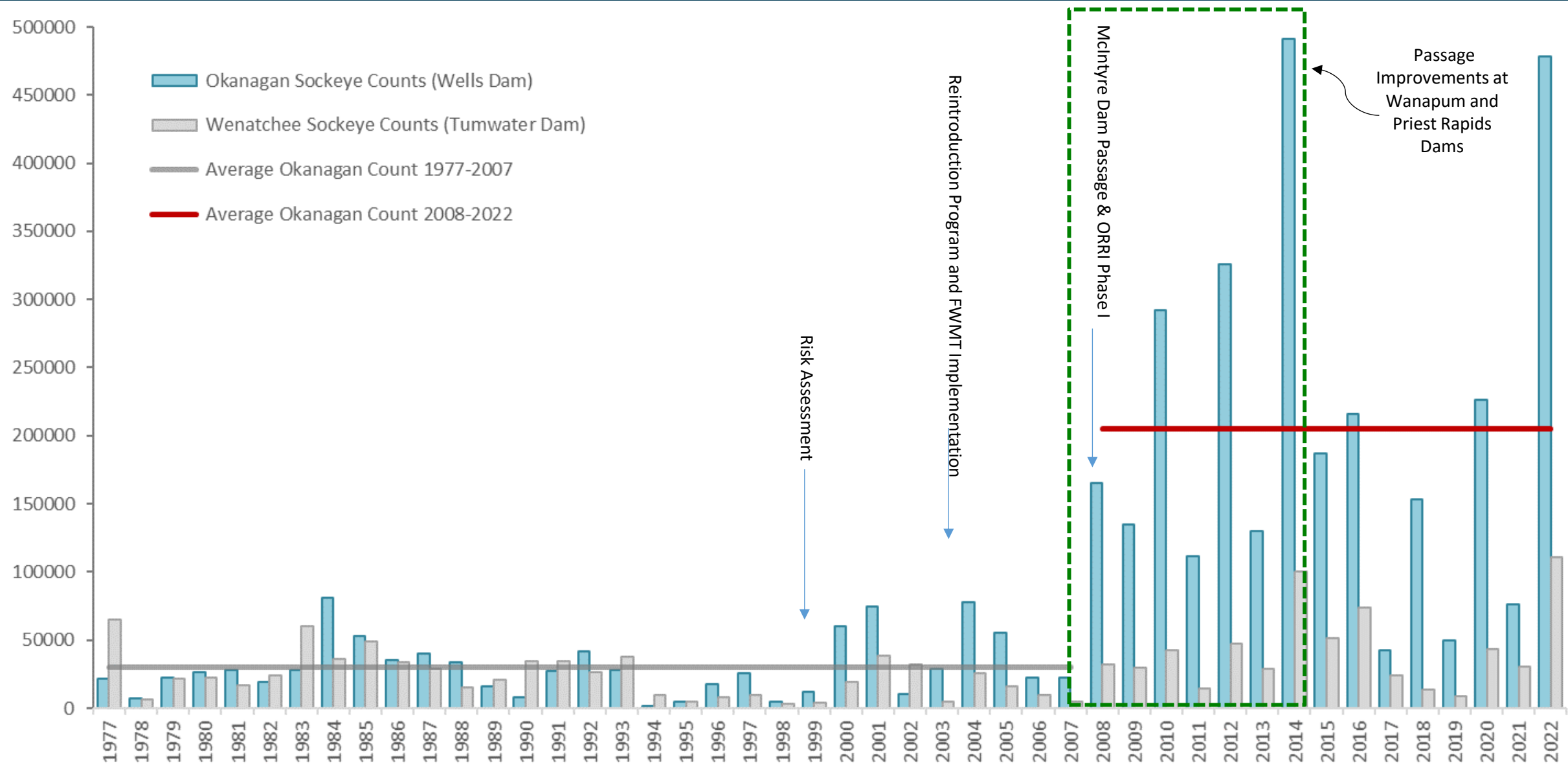


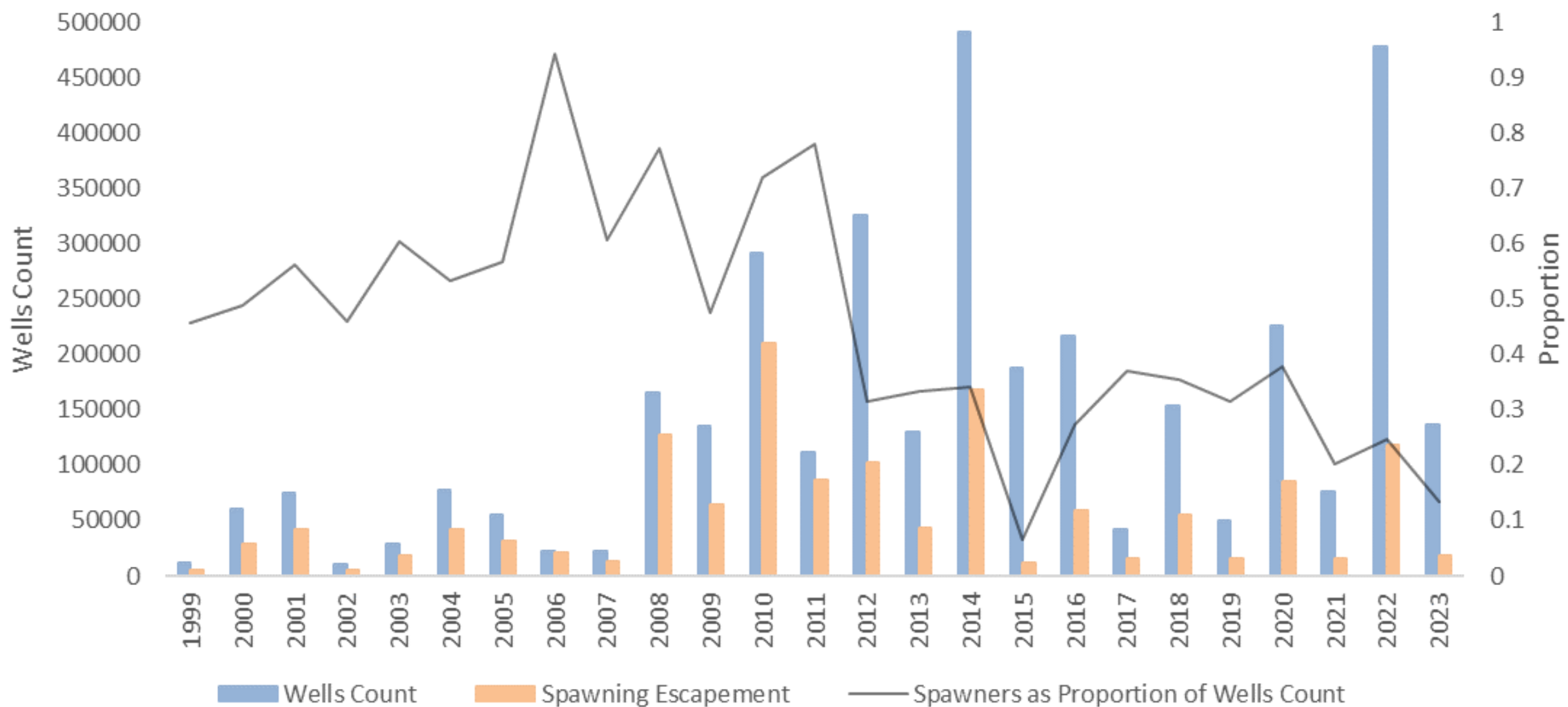
1. Okanagan Lake kokanee shore spawners affected by lake level
2. Okanagan River Sockeye effected by river flows
3. Flood control & drought
4. Water use (i.e. agriculture in Okanagan Valley)

Fish Water Management Tool



Sockeye Returns Before and After Okanagan Restoration and Reintroduction Initiatives







kł cp'əlk' stim' : “cause to come back”



kł c'pəl'k' stím'
lim limpt