

Pacific Lamprey Restoration within the Yakama Nation Ceded Lands: Current Status and Future Plans

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Five Columbia River
in Council





Why Should We Care?

Tribal Culture & Food Source



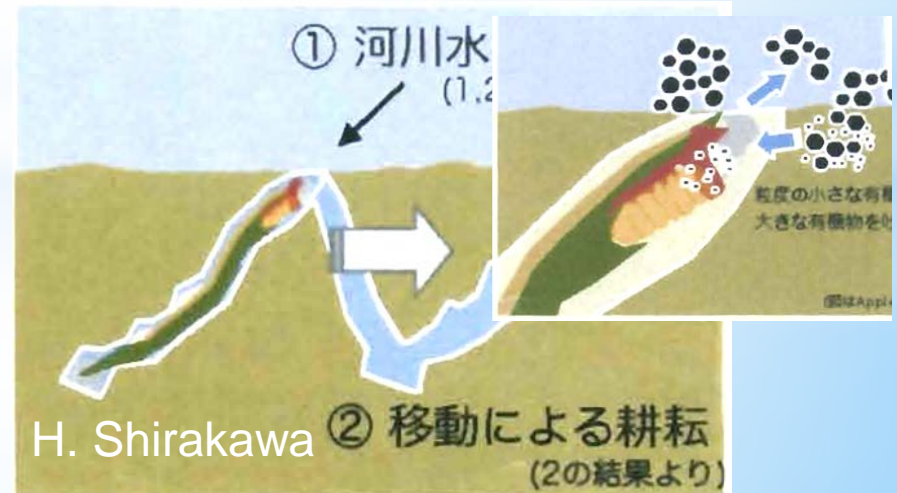
Food for Numerous Species

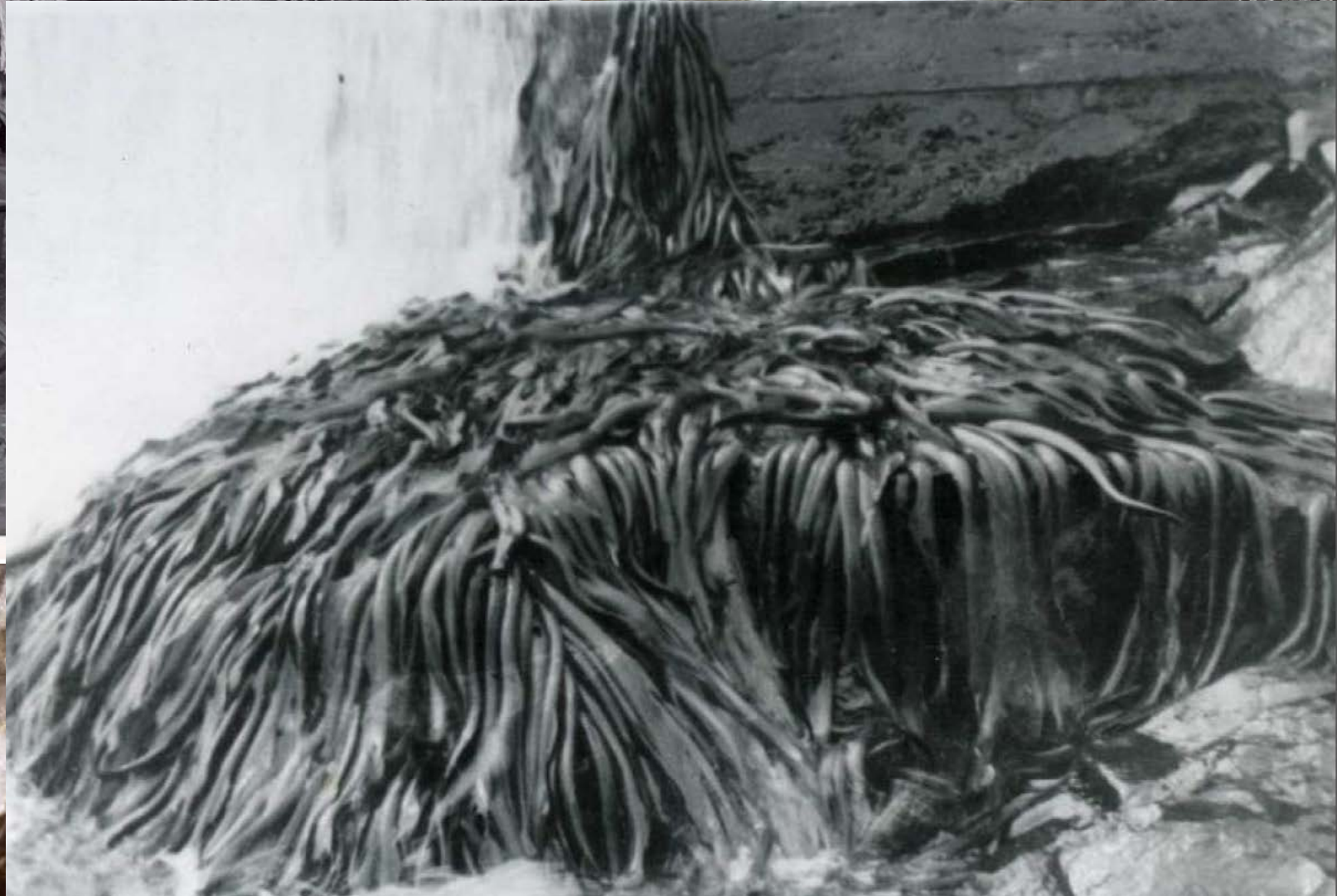


Buffer for Salmon Predation

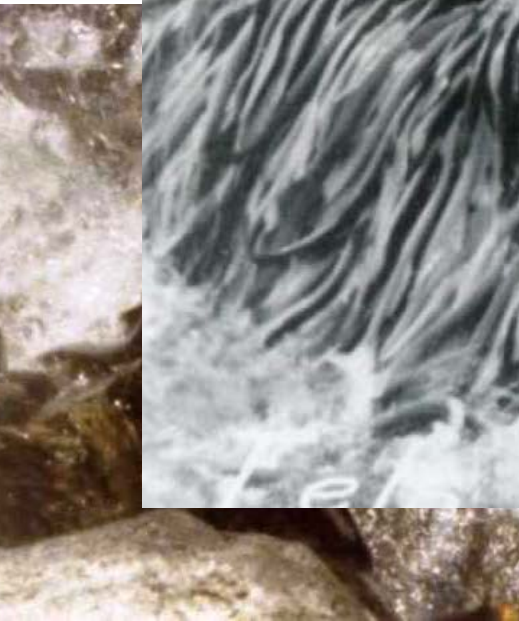


"Farmer of the Underwater World"





Felt at Willamette Falls. 1915



Chum



Chinook



Coho



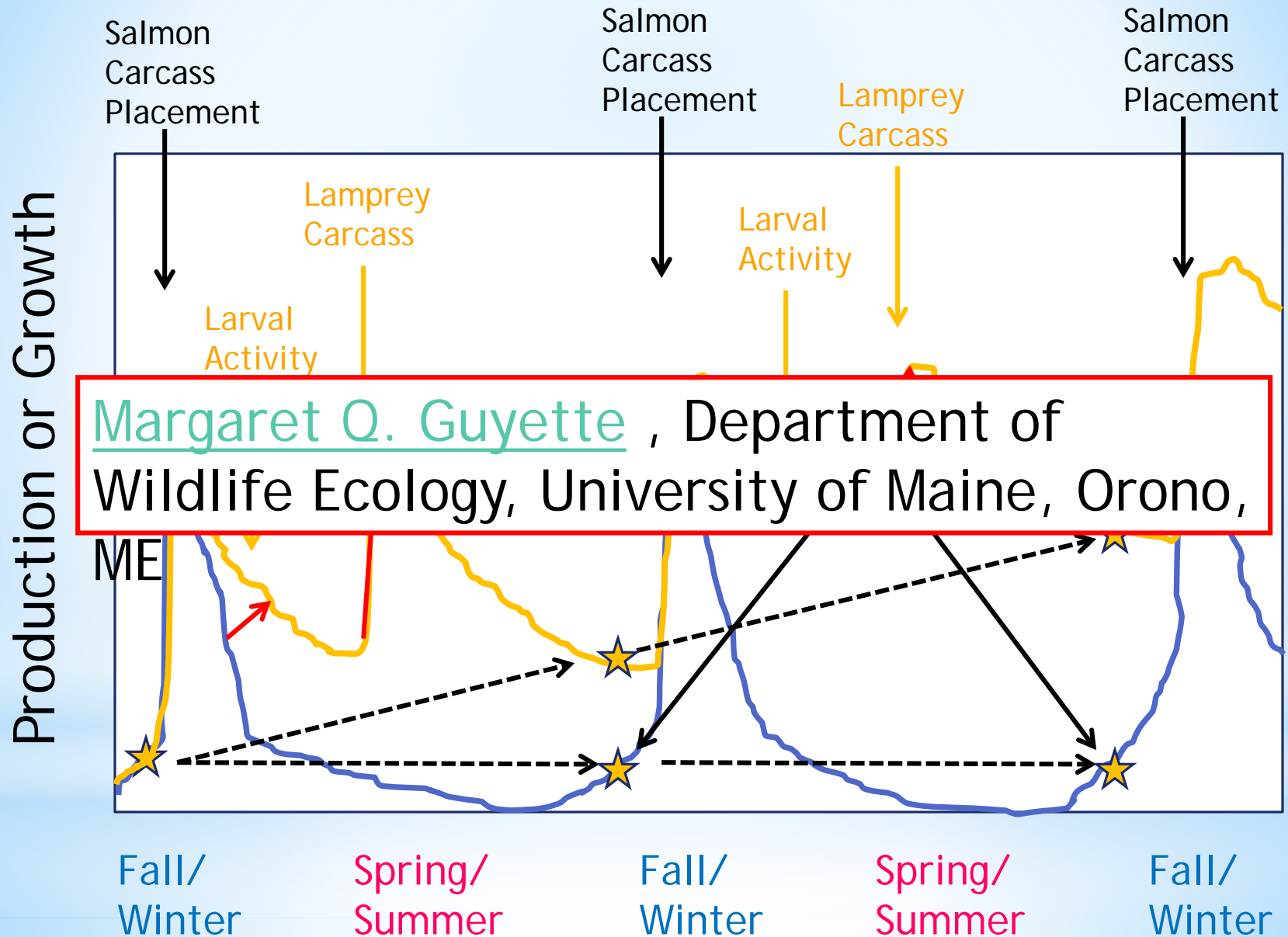
Steelhead

It's the food source, stupid!

What about lamprey???

Nutrient Limited Streams

Photo by R Nelson



Project Goals

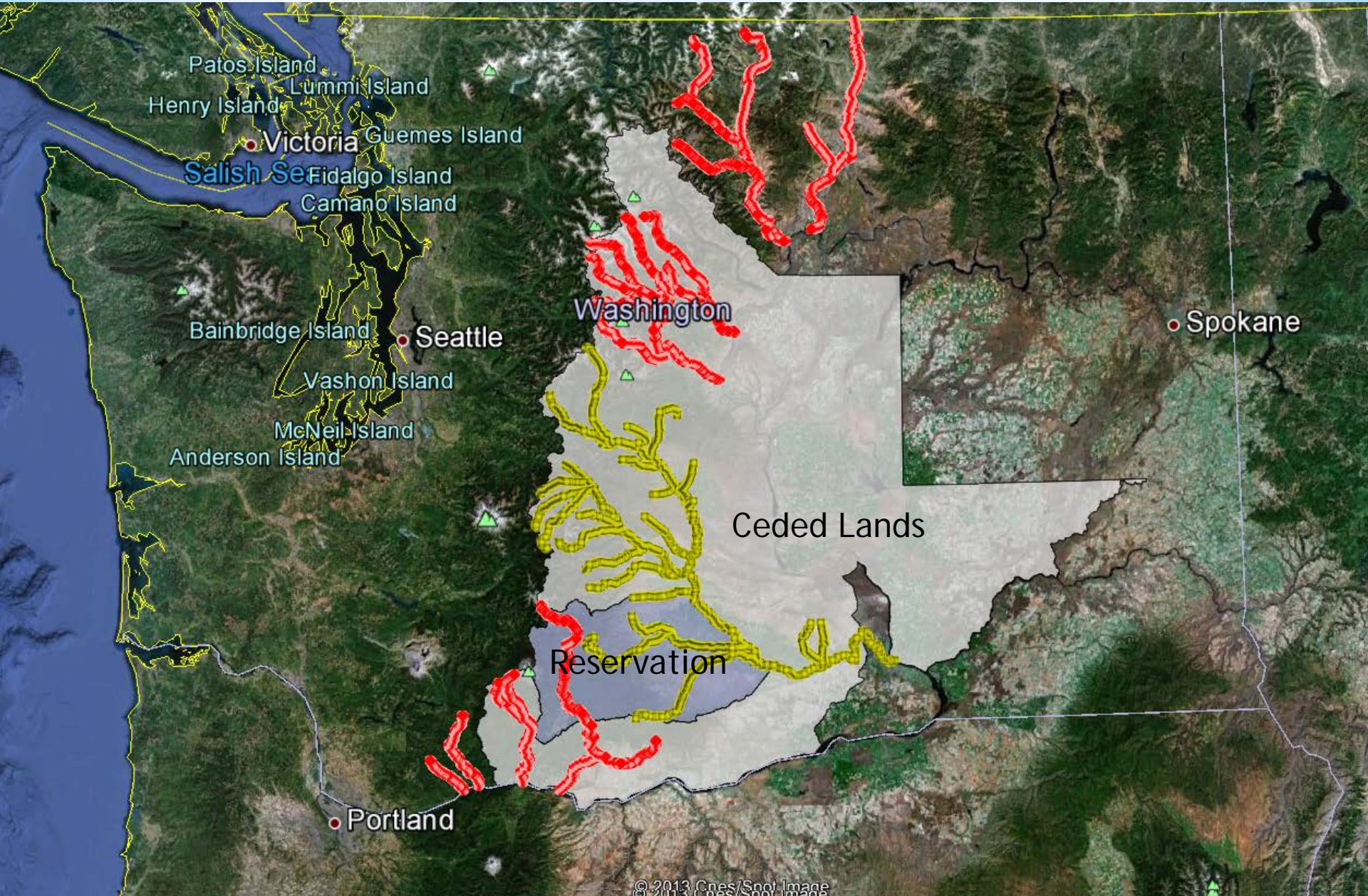
To restore lamprey in all YN Ceded lands for **sustainable harvest** and **ecological contribution**

objectives include:

- Obtaining baseline information
- Development of status and trend
- Research in all aspects of life history
- Supplementation



Project Area



Major Threats within Yakima Subbasin

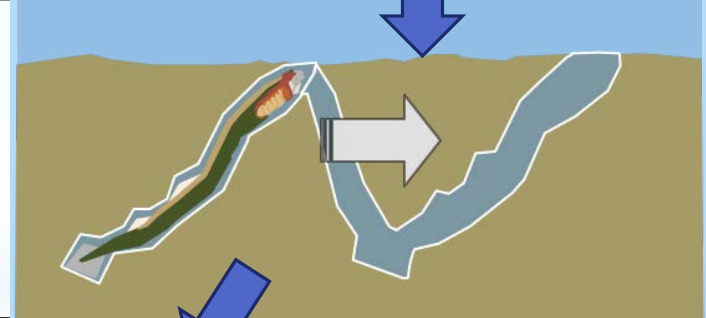
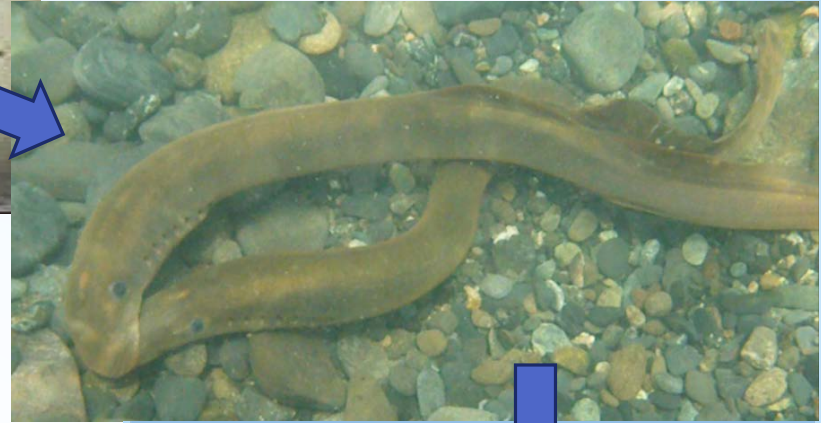
- Many dams to pass
- Entrainment in diversion screens
- Predation on c
- Water "quality" (temperature)
- Water "quantity" issues (diversion & flow management)
- Existing population is virtually extinct



Give us a
break!!!

Summary of Monitoring

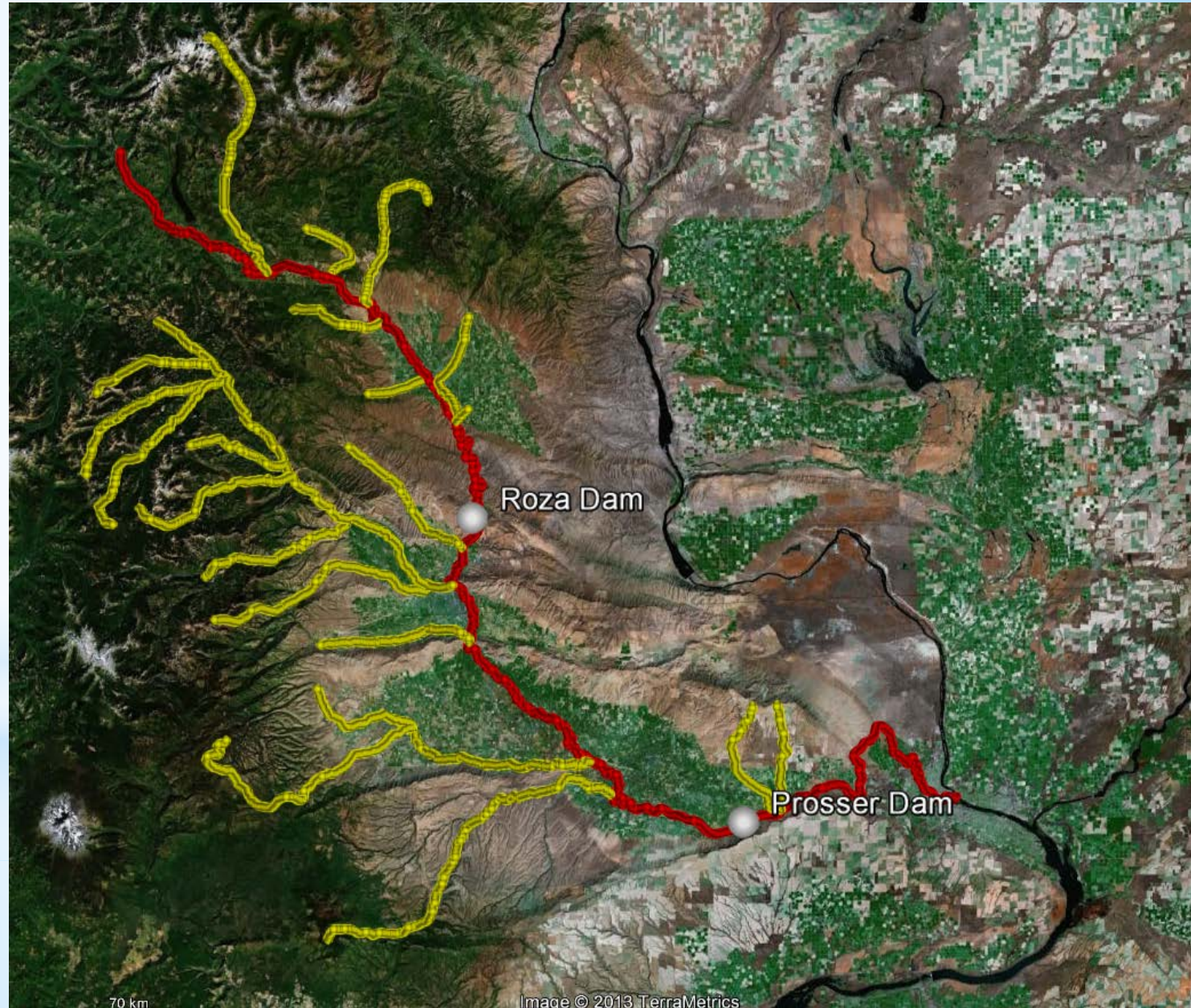
1. Adult Migration
2. Adult Spawning
3. Larva
4. Macrophthalmia
5. Ocean



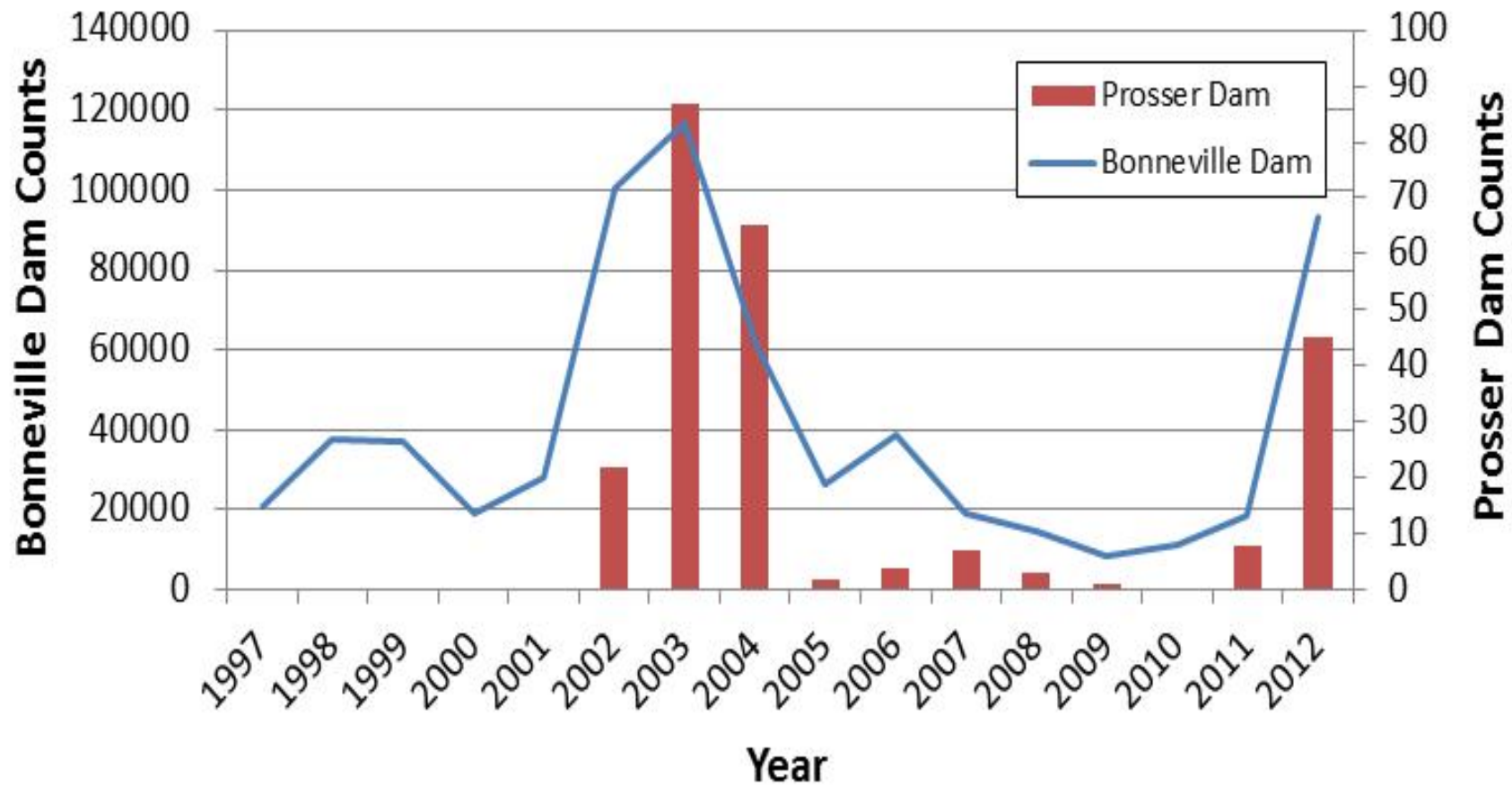
Adult Fish Counting Stations

Prosser Dam
(rkm 75.6)
-> 1983~

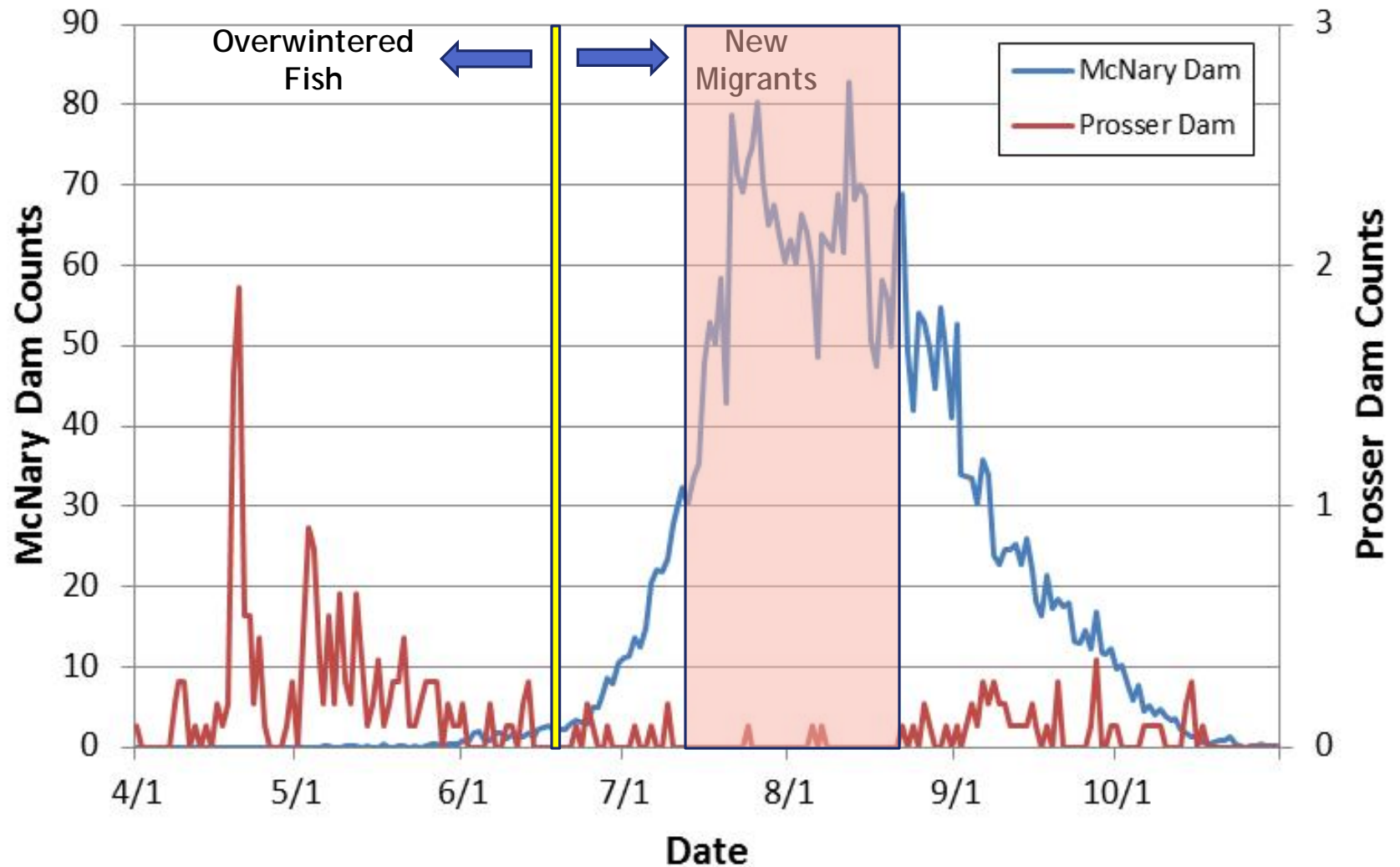
Roza Dam
(rkm 210.5)
-> none



Total Adult Pacific Lamprey Counts (1997-2012)

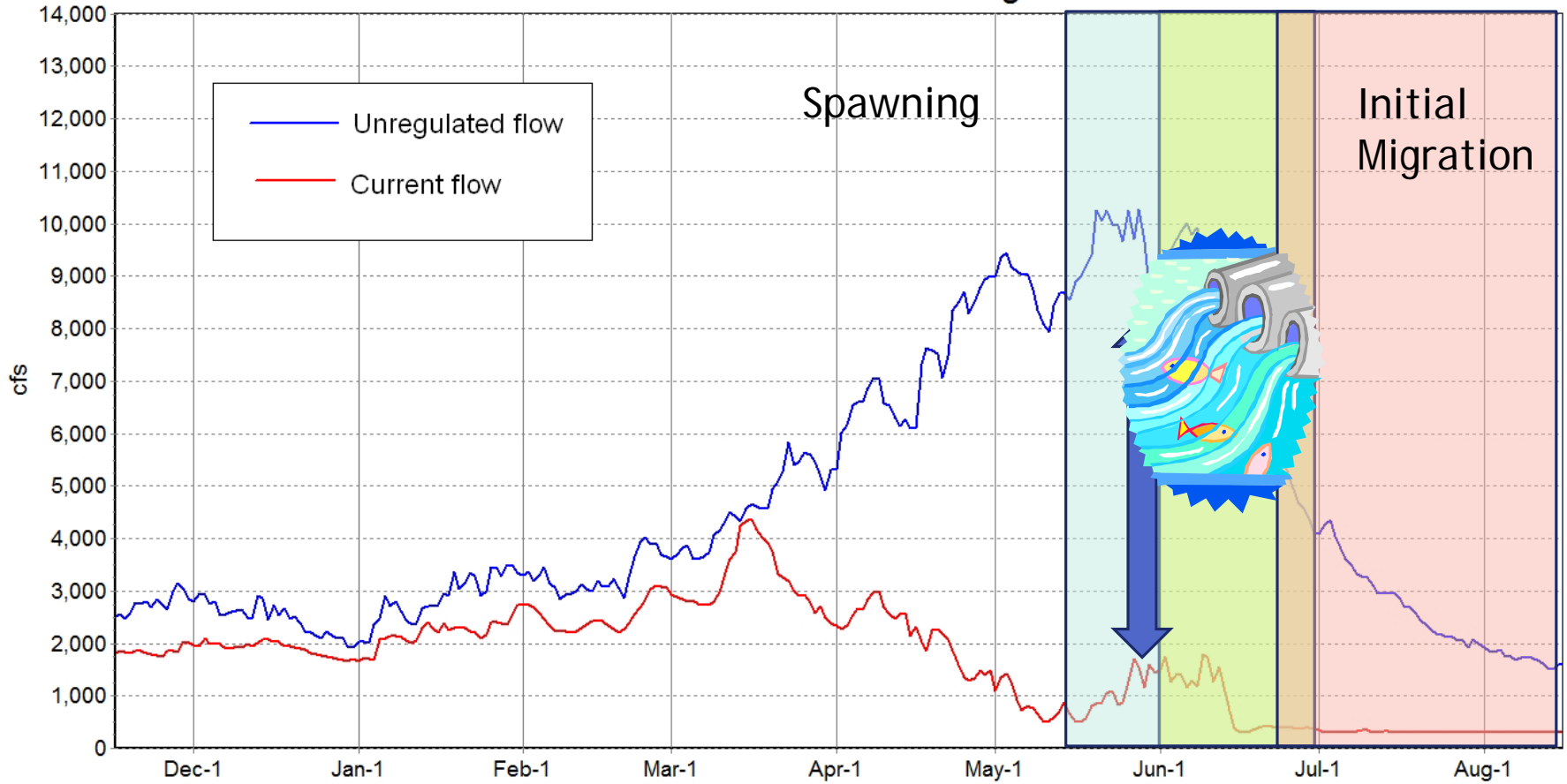


Mean Adult Pacific Lamprey Counts (2000-2012)



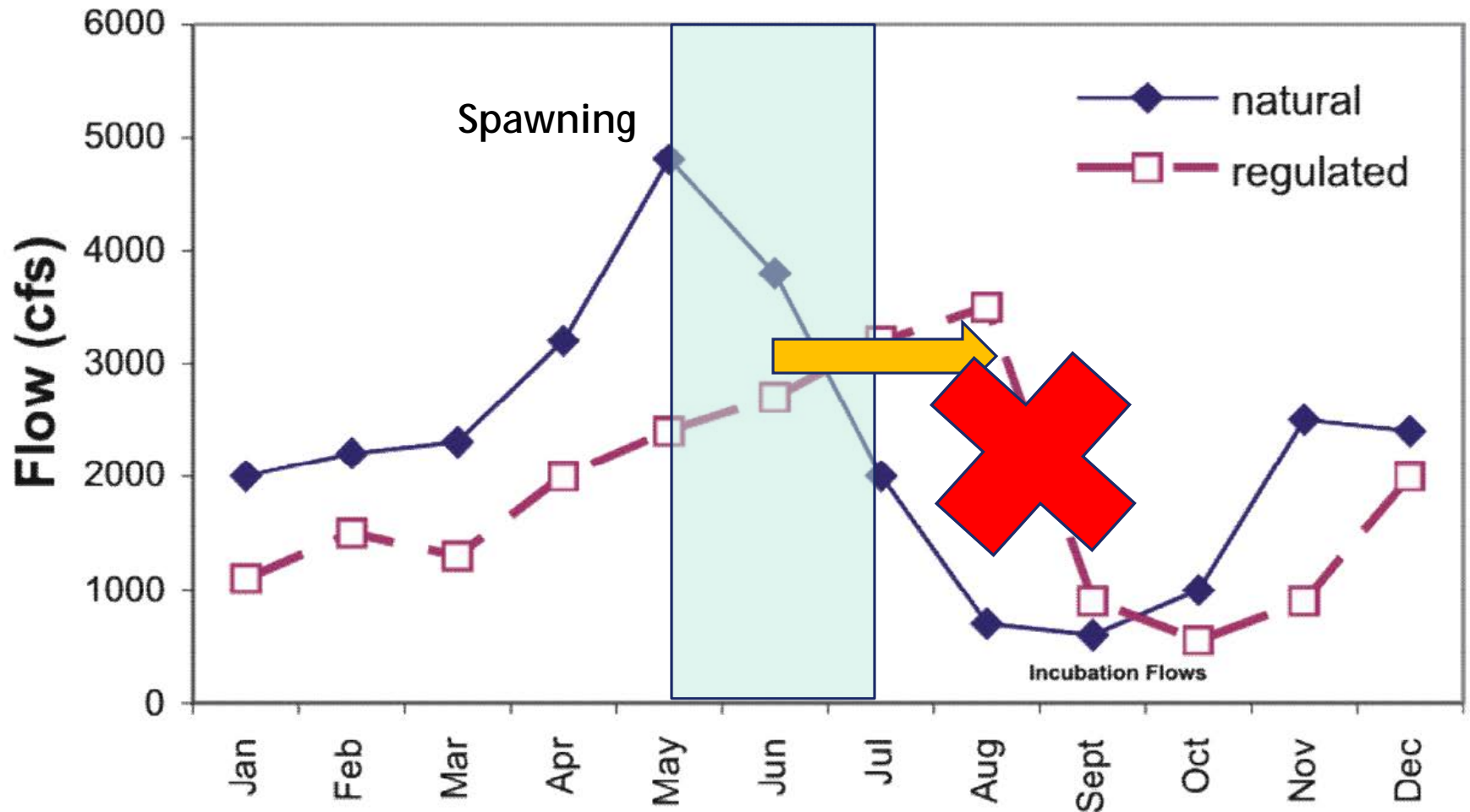
Water Quantity & Quality

Yakima River at Parker Current vs Unregulated Flow



Water Quantity: Flip Flop (1982~)

Yakima R. at Cle Elum




USFWS Radio Telemetry Study (2011~)



Larval Surveys: 2010

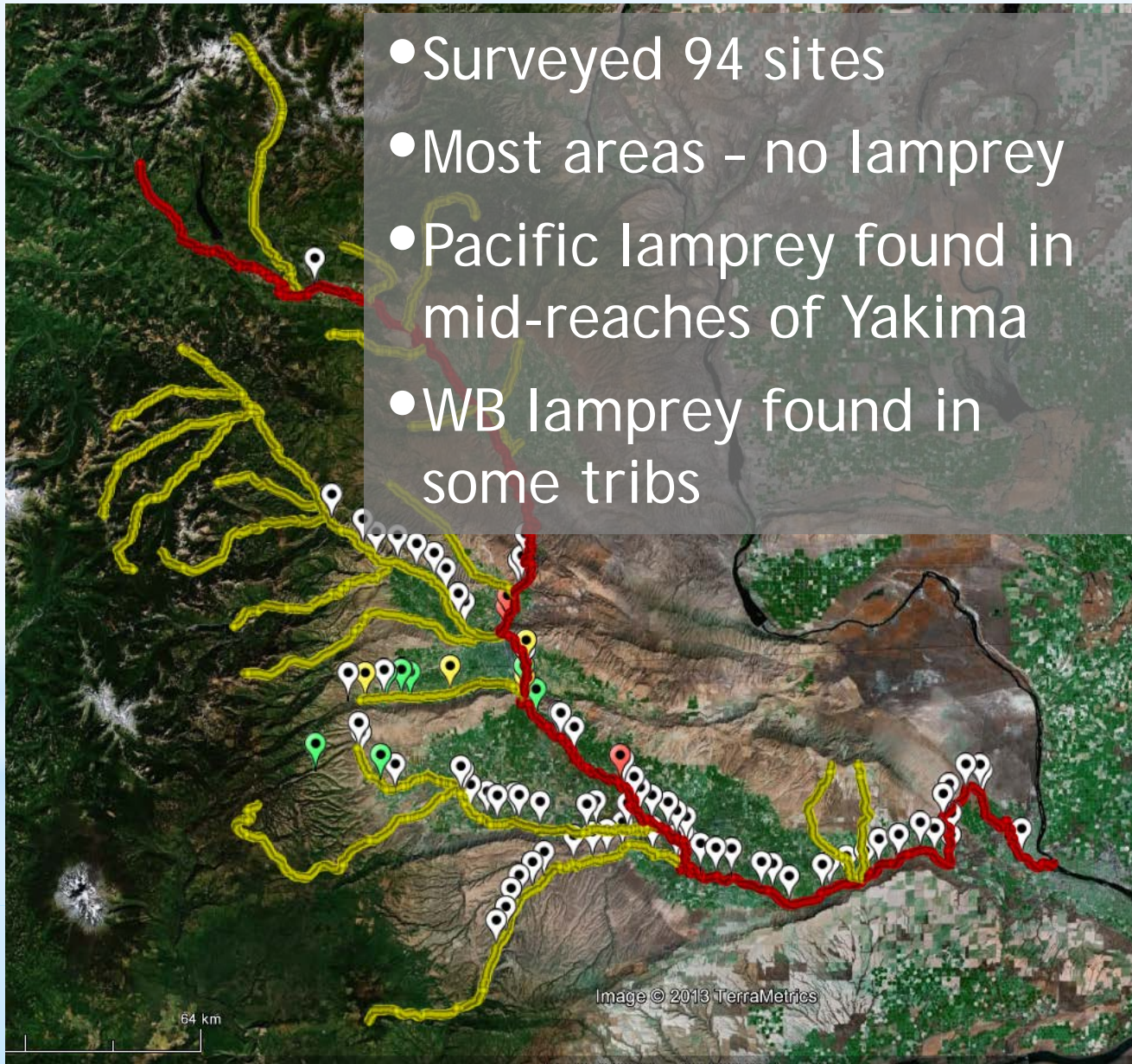
 Pacific Lamprey

 Western Brook Lamprey Only

 Unknown Lamprey


 No Lamprey

- Surveyed 94 sites
- Most areas - no lamprey
- Pacific lamprey found in mid-reaches of Yakima
- WB lamprey found in some tribs



Larval Surveys: 2011

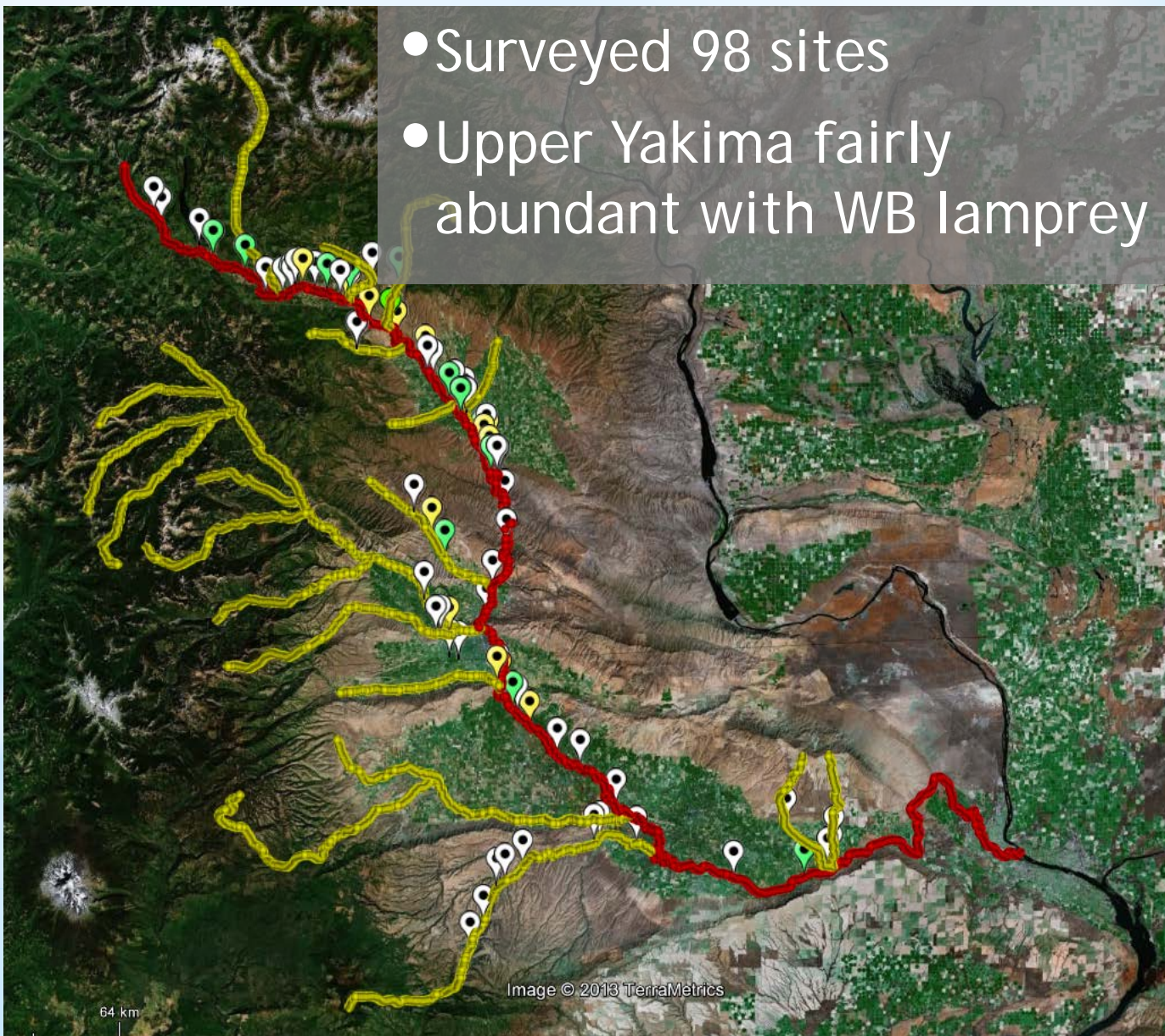
 Pacific Lamprey

 Western Brook Lamprey Only

 Unknown Lamprey


 No Lamprey

- Surveyed 98 sites
- Upper Yakima fairly abundant with WB lamprey



Larval Surveys: 2012

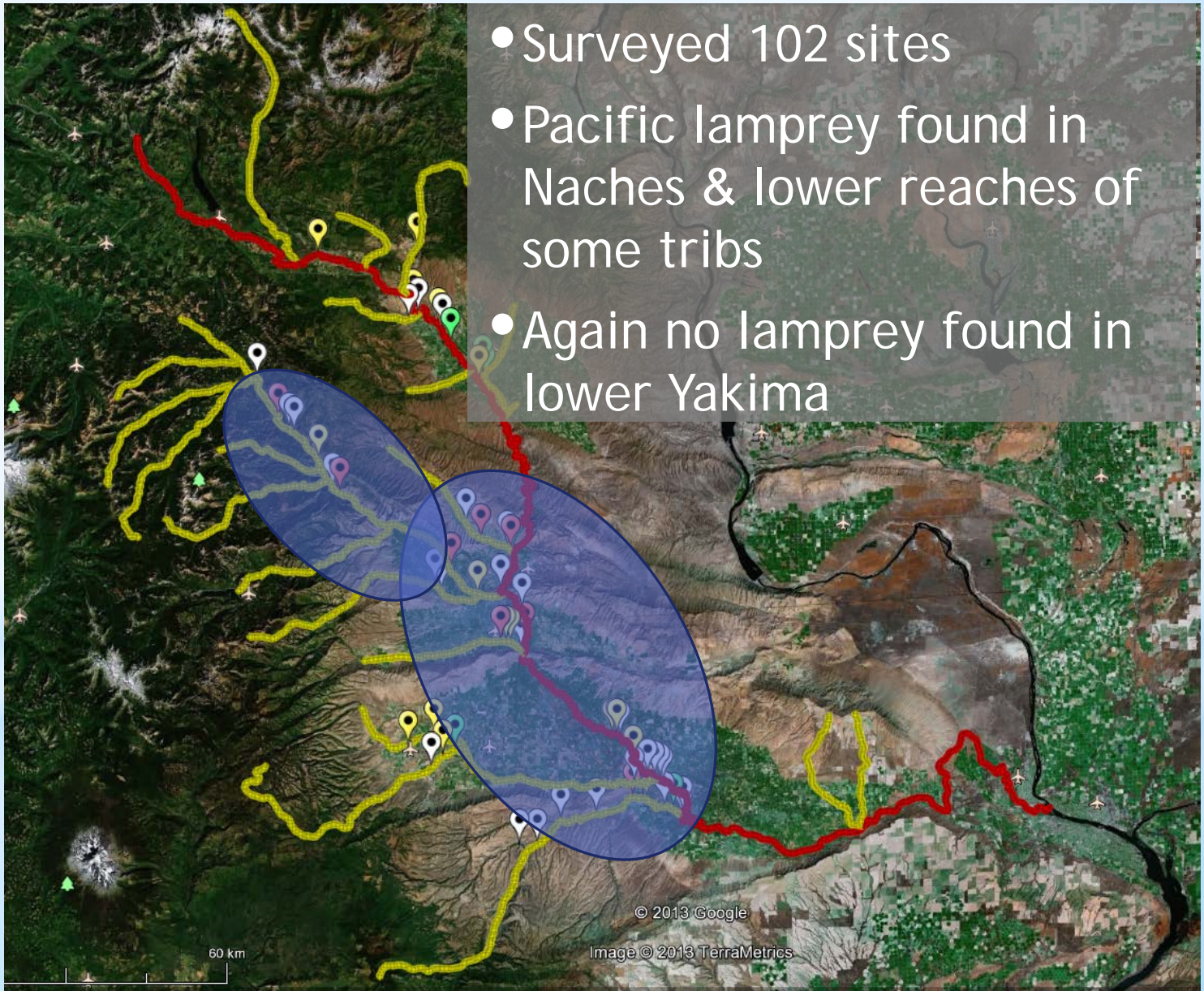
 Pacific Lamprey

 Western Brook Lamprey Only

 Unknown Lamprey

 No Lamprey

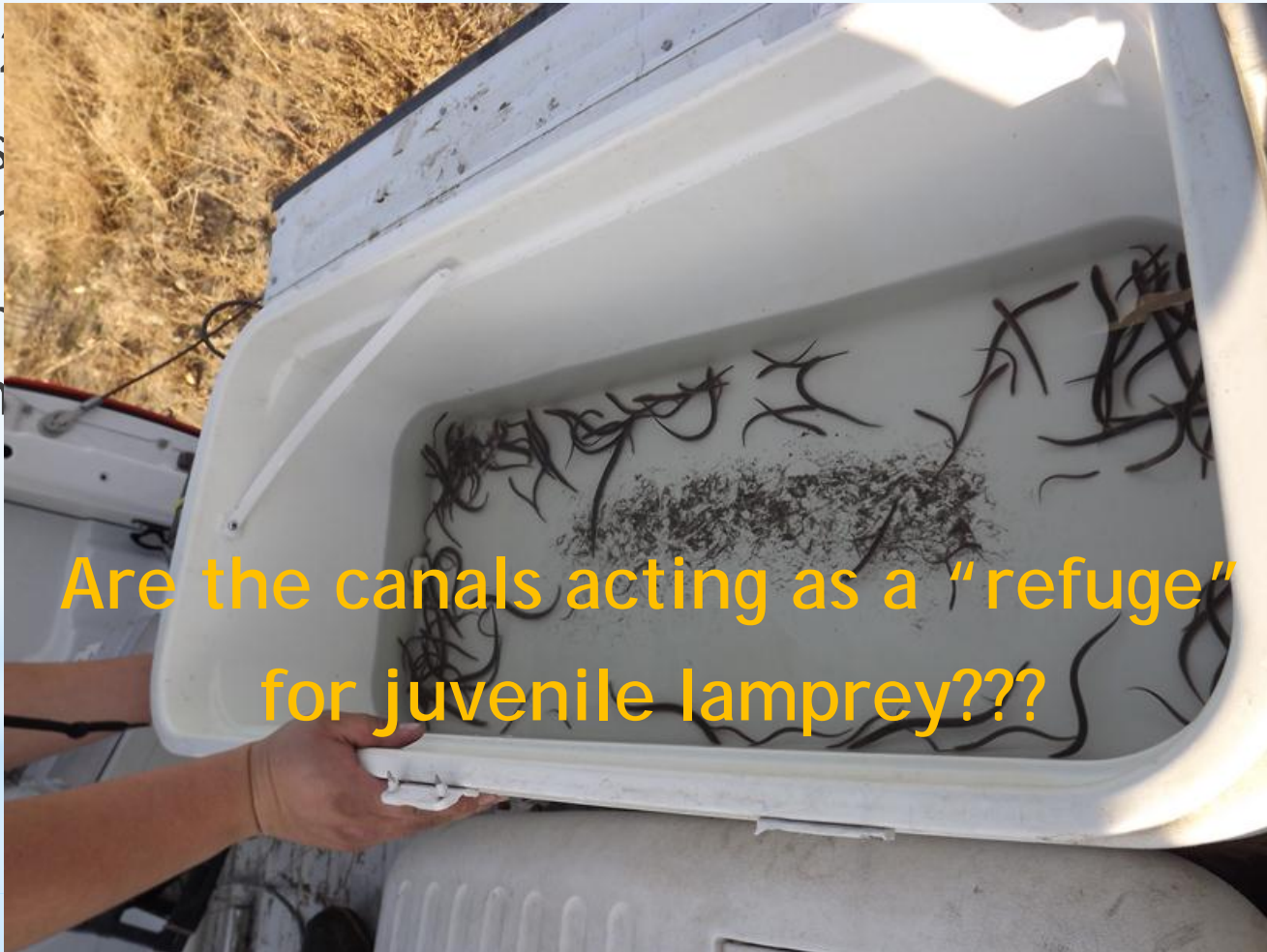
- Surveyed 102 sites
- Pacific lamprey found in Naches & lower reaches of some tribs
- Again no lamprey found in lower Yakima



Lamprey in Diversions

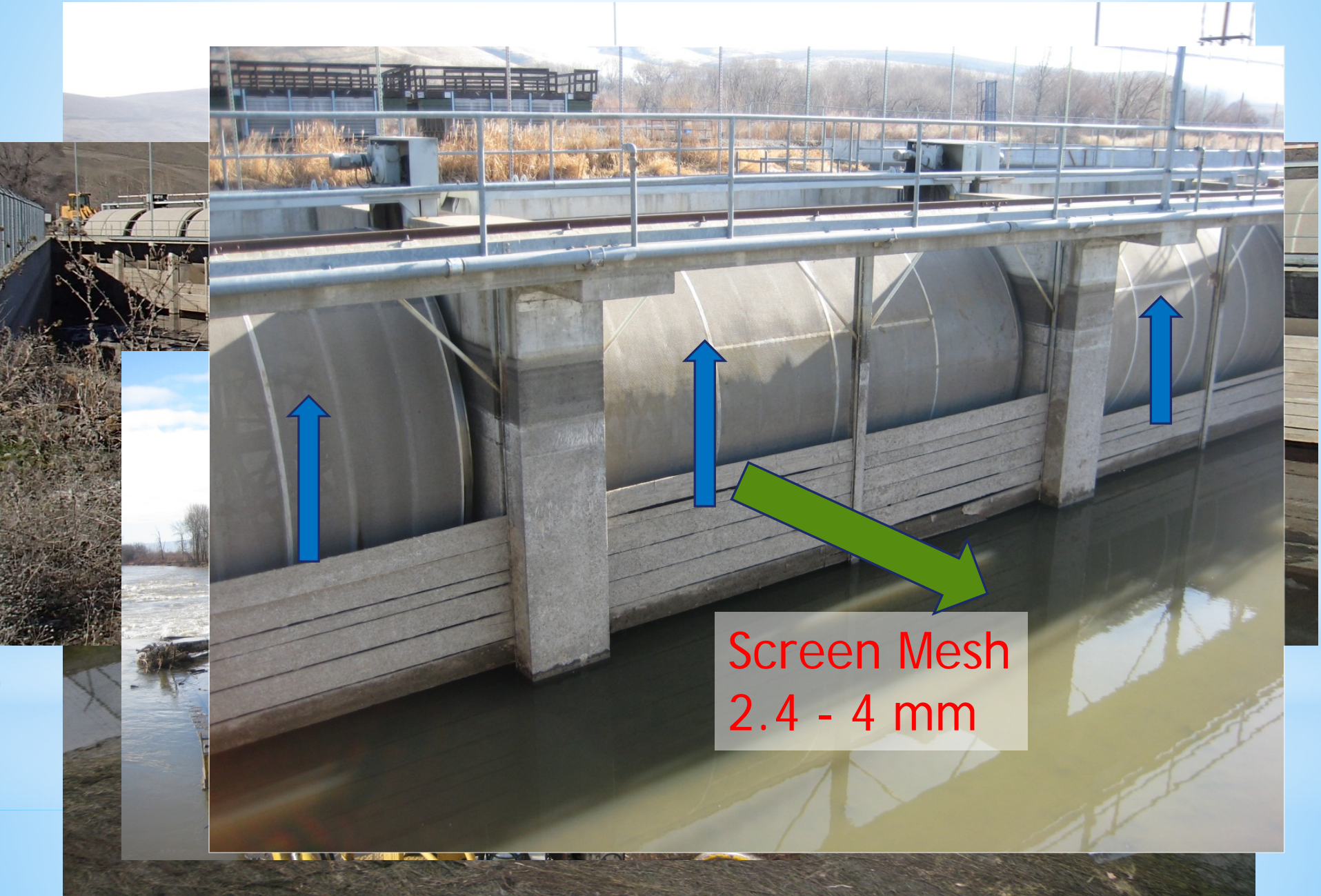
2010-

- We s
(com
- Four
in th



Are the canals acting as a "refuge"
for juvenile lamprey???

rs

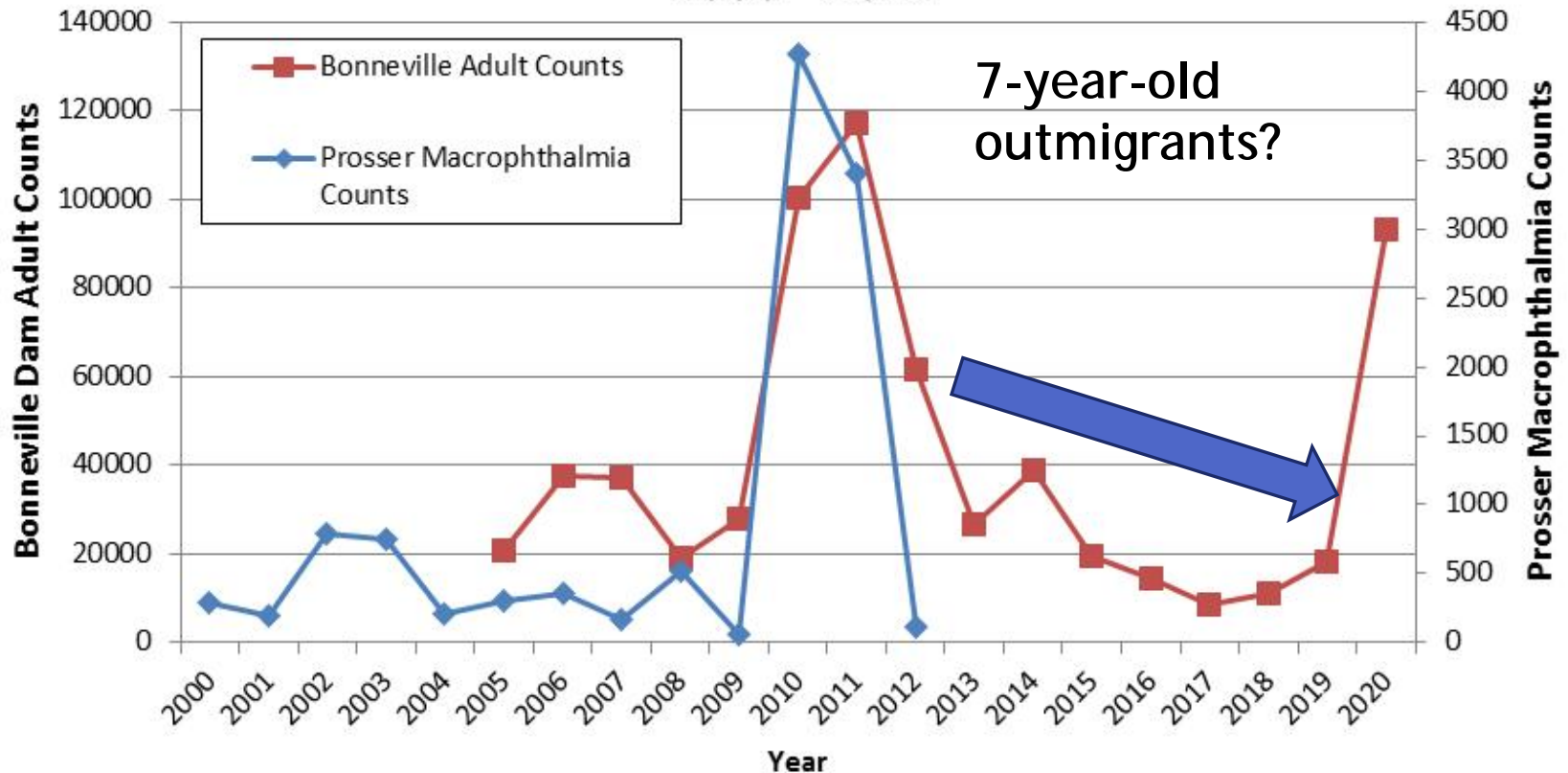


Screen Mesh
2.4 - 4 mm

Macrophthalmia

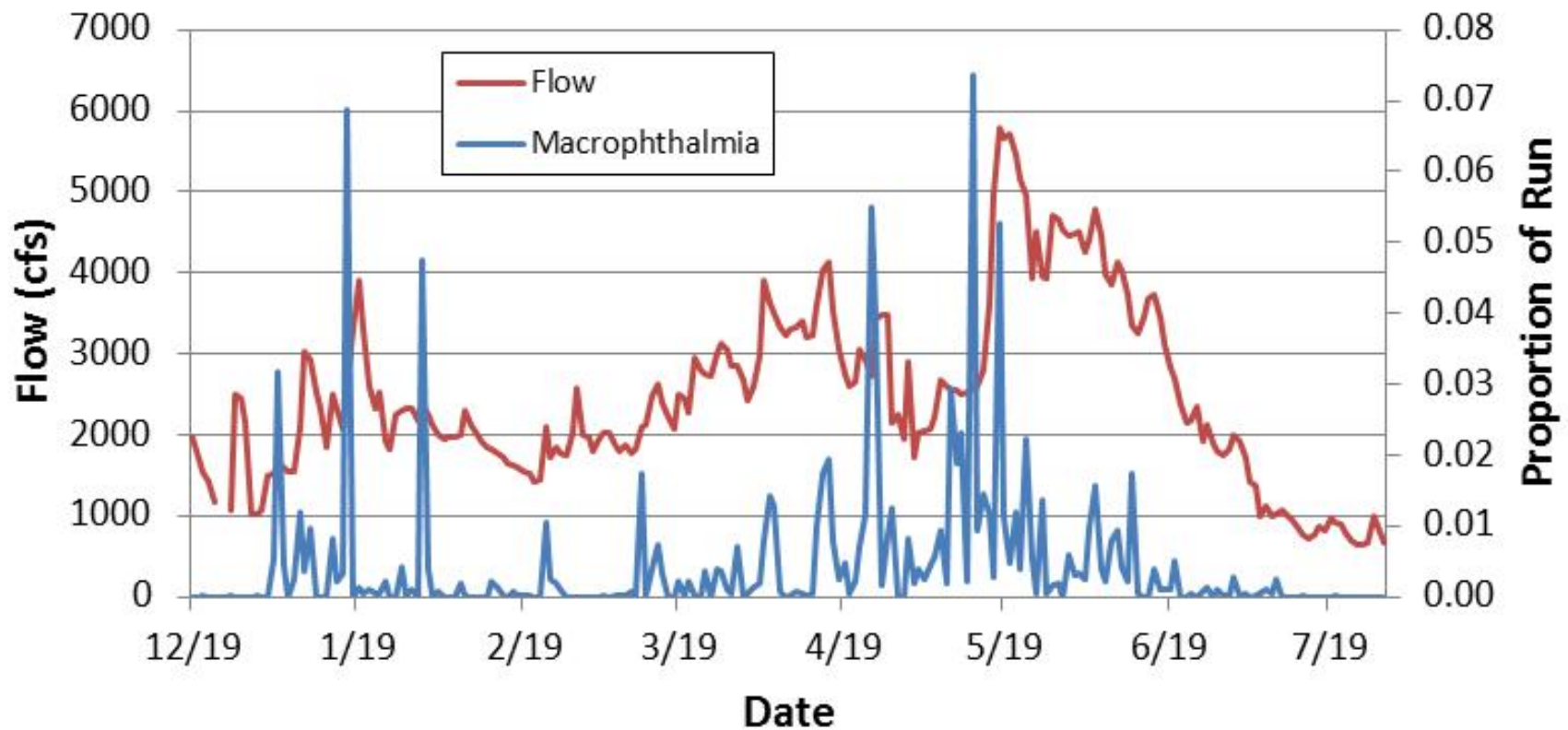


Adult (BON) vs. Macrophthalmia (Prosser) Counts 2000 - 2012



Macrophthalmia – 2000-2012

Macrophthalmia Counts at Prosser Dam



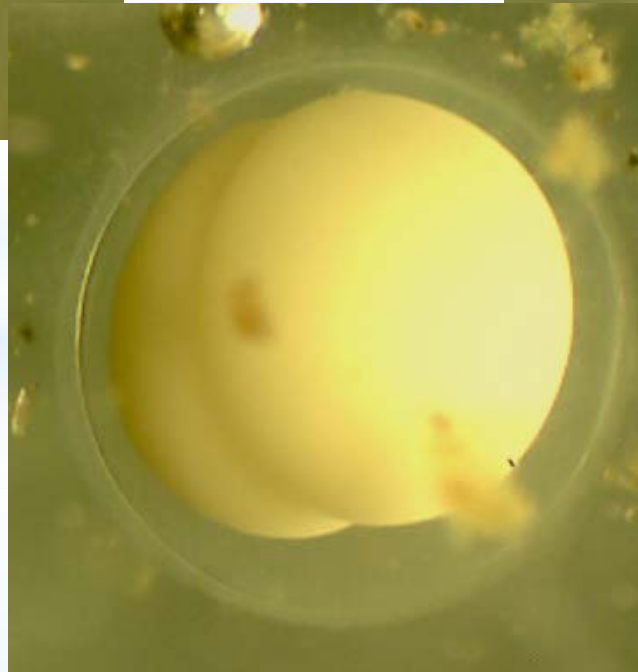
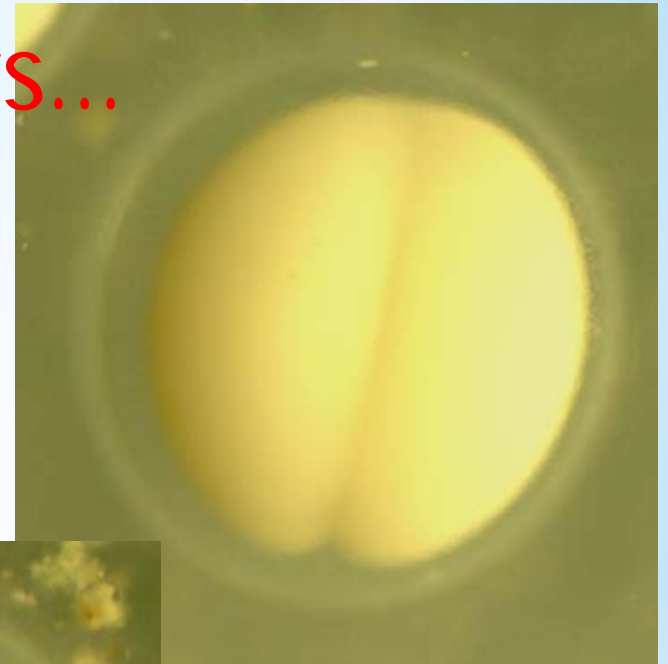
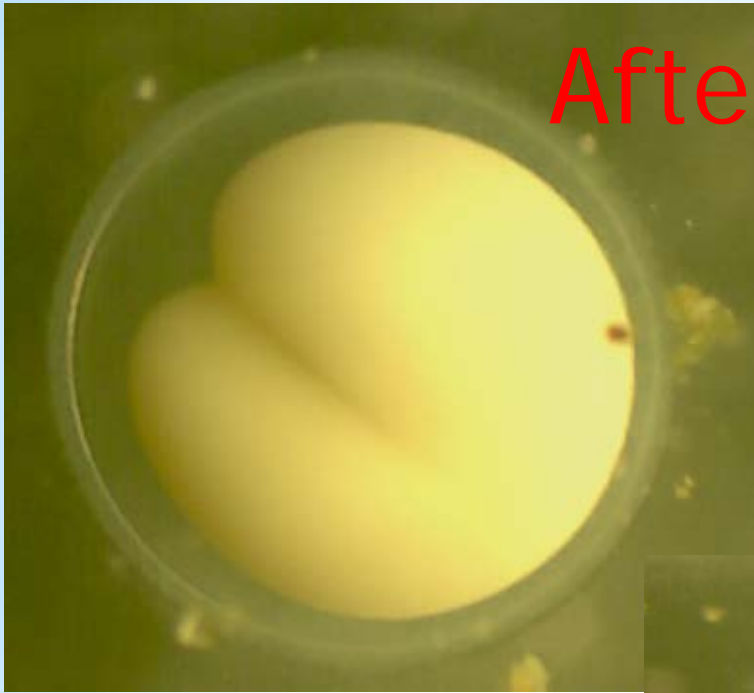
“Flow” & “Rate of Change in Flow”

Adult Spawning

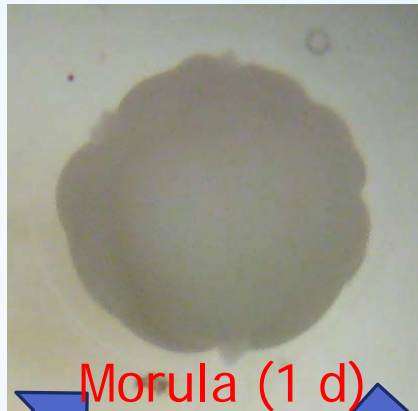


Egg Development

After 6 hours...



Egg Development



Morula (1 d)



Crested (8 d)



Cleavage (0.5 d)



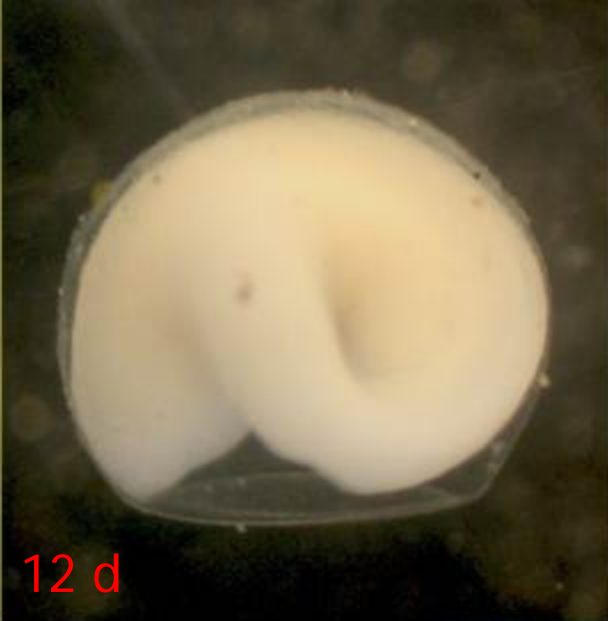
Lemon (4 d)



Clam (11 d)



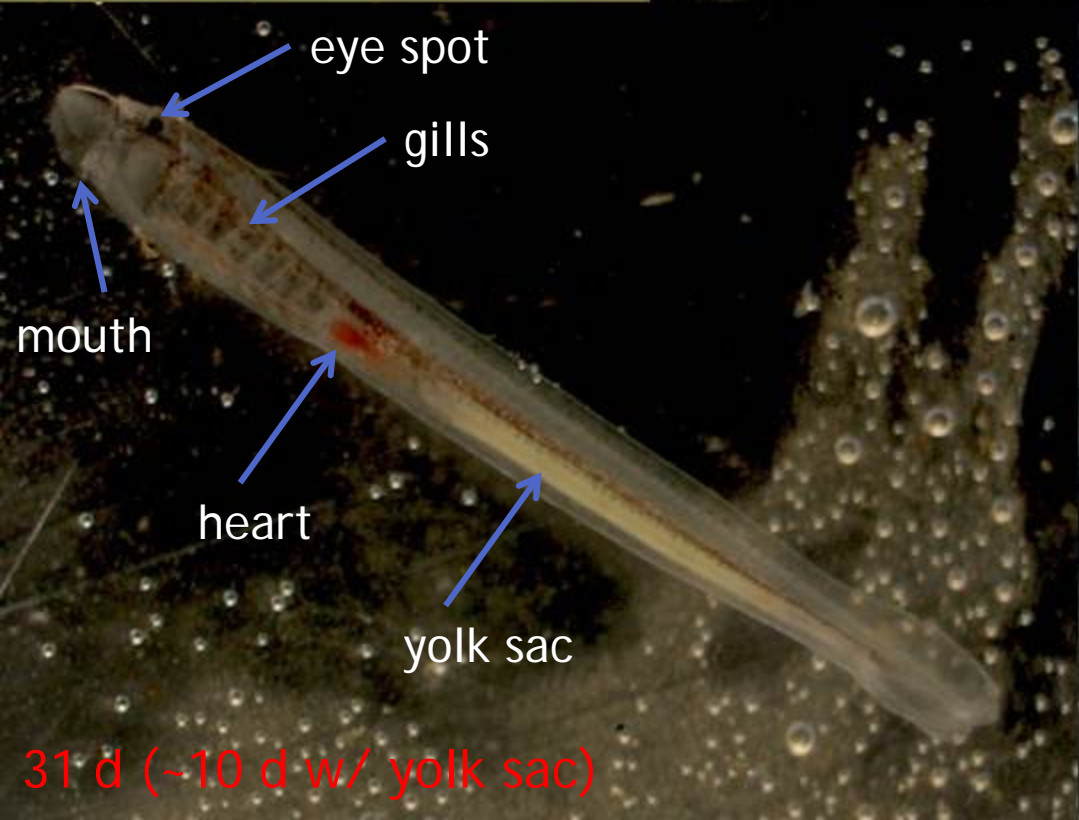
0.25 d



12 d



14 d



31 d (~10 d w/ yolk sac)



21 d

Back to the Wild!



Next Steps...



100

80

60

40

20

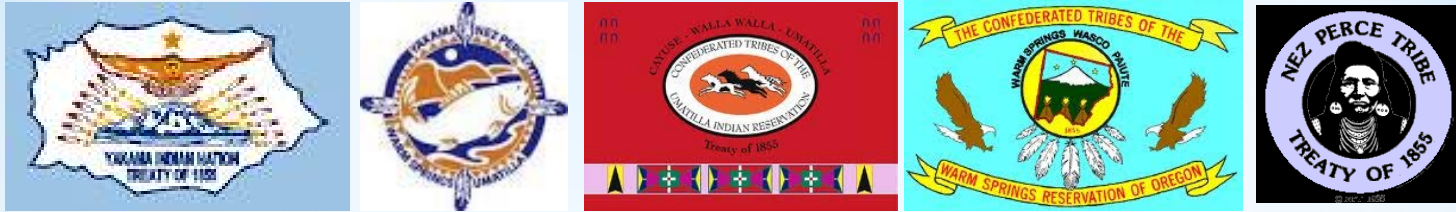


2010

Partnership is the key!!!

- BPA: Fish Accords Funding
- BOR: Adult Passage & Canal Entrainment Funding
- WDFW: Canal Entrainment Monitoring
- USGS: Juvenile Lamprey Screen Design
- USFWS: Conservation Assessment & Agreement
- CRITFC: Columbia Tribes Lamprey Restoration Plan
- US ACE: 10-Year Passage Plan
- PUDs: Mid-Columbia Management Plans
- Yakama Nation Fisheries: Salmonid Programs
- Irrigation Districts: Canal Entrainment Issues

Acknowledgement



Yakama Nation General and Tribal Councils, Fish & Wildlife, Law & Order Committees

