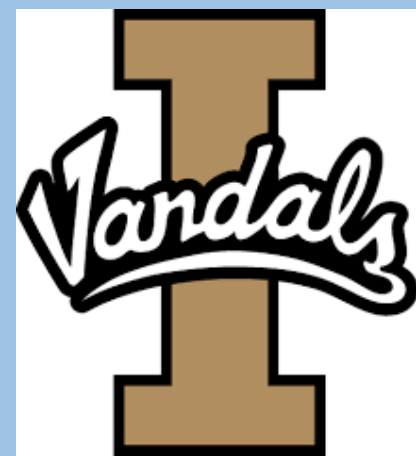


Movement Patterns of Artificially Reconditioned Kelt Steelhead Following Release in the Yakima River Basin.

Branstetter R.D.¹, Newell J.¹, Frederiksen C.R.², Trammel J.², Blodgett J.W.², Bosch W.J.², Begay B.¹, Graham N.¹, Pierce A.L.^{1,3}, Stephenson J.¹, Fast D.E.², Hatch D.R.¹

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Introduction

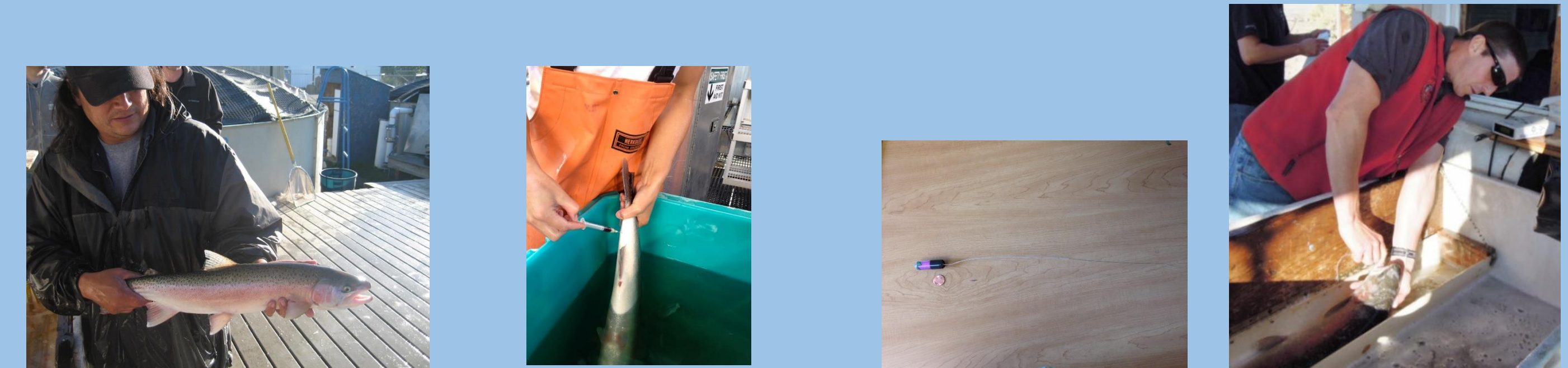
- One of the uncertainties surrounding the survival benefit of long-term reconditioning is the actual spawning success of reconditioned kelts (2014 Federal Columbia River Power System Supplemental Biop).
- The Independent Science Review Panel has also requested additional information on kelt reproductive success.
- Yakama Nation Viable Salmon Population study had radio tracking equipment in place.
- Little is known about kelt homing.

Objectives

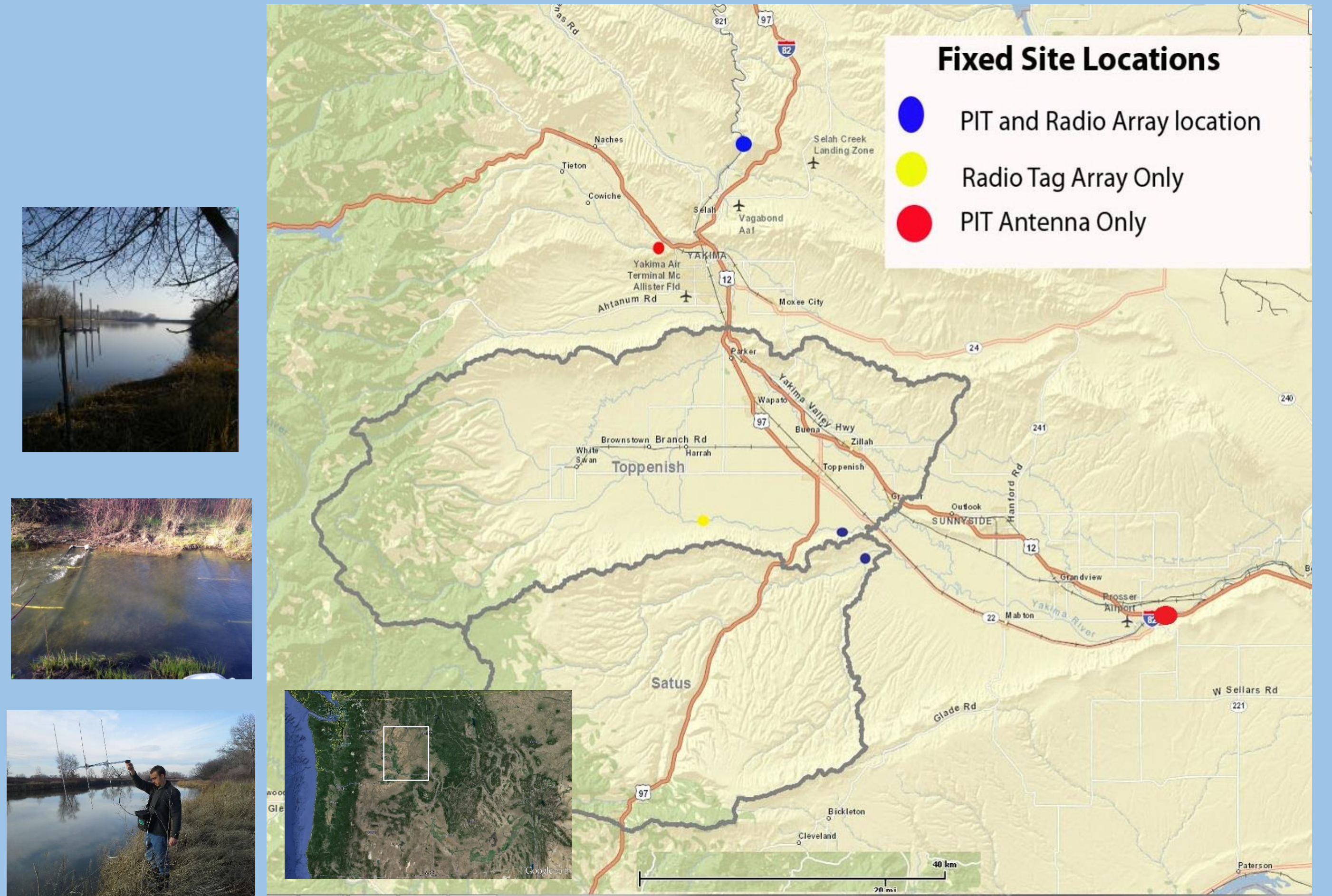
- Identify spawn locations.
- Determine homing fidelity and spawn timing if previous detection histories are present.
- Document reproduction from repeats spawners by collecting kelt progeny.

Methods

- Study conducted from fall 2013 through late spring 2014.
- Recondition kelts similarly as described in poster P-48 (Graham).
- Pit tag and genotype all kelts.
- Radio tag a subset of mature kelts based on hormone assay W-141-18 (Pierce).



- Utilize PIT-tag array and radio tracking to determine steelhead kelt post release movements.

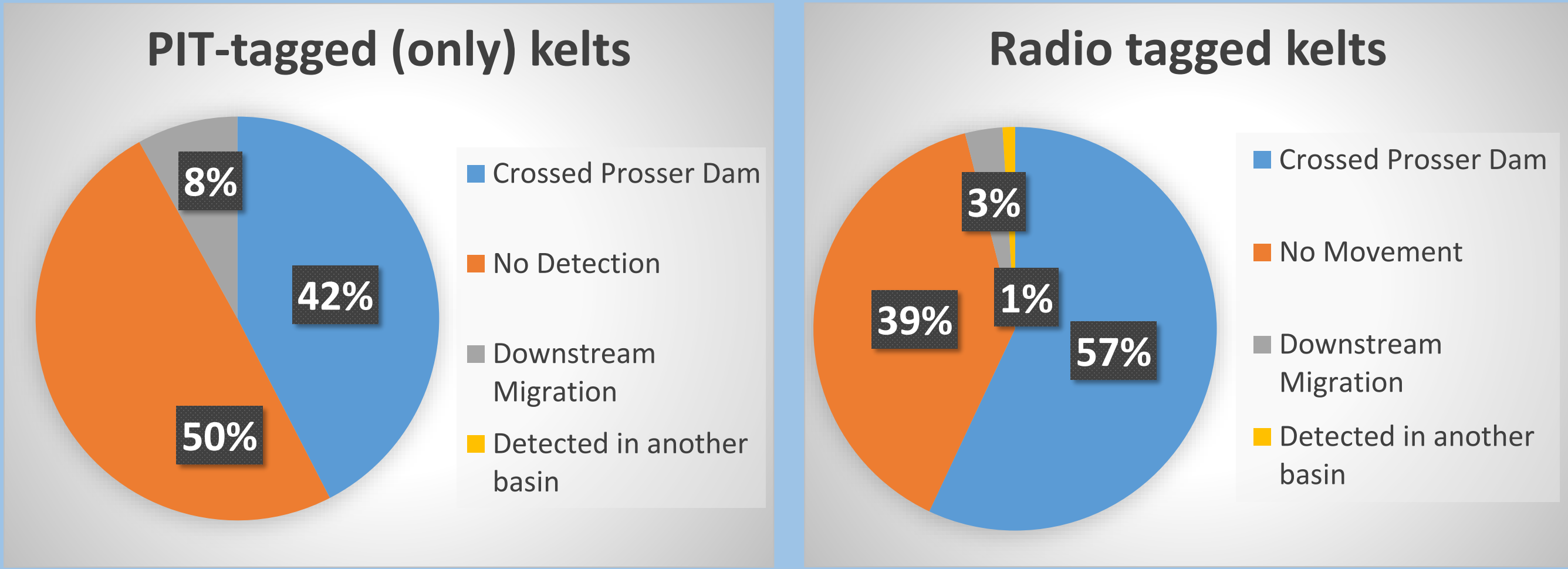


Results

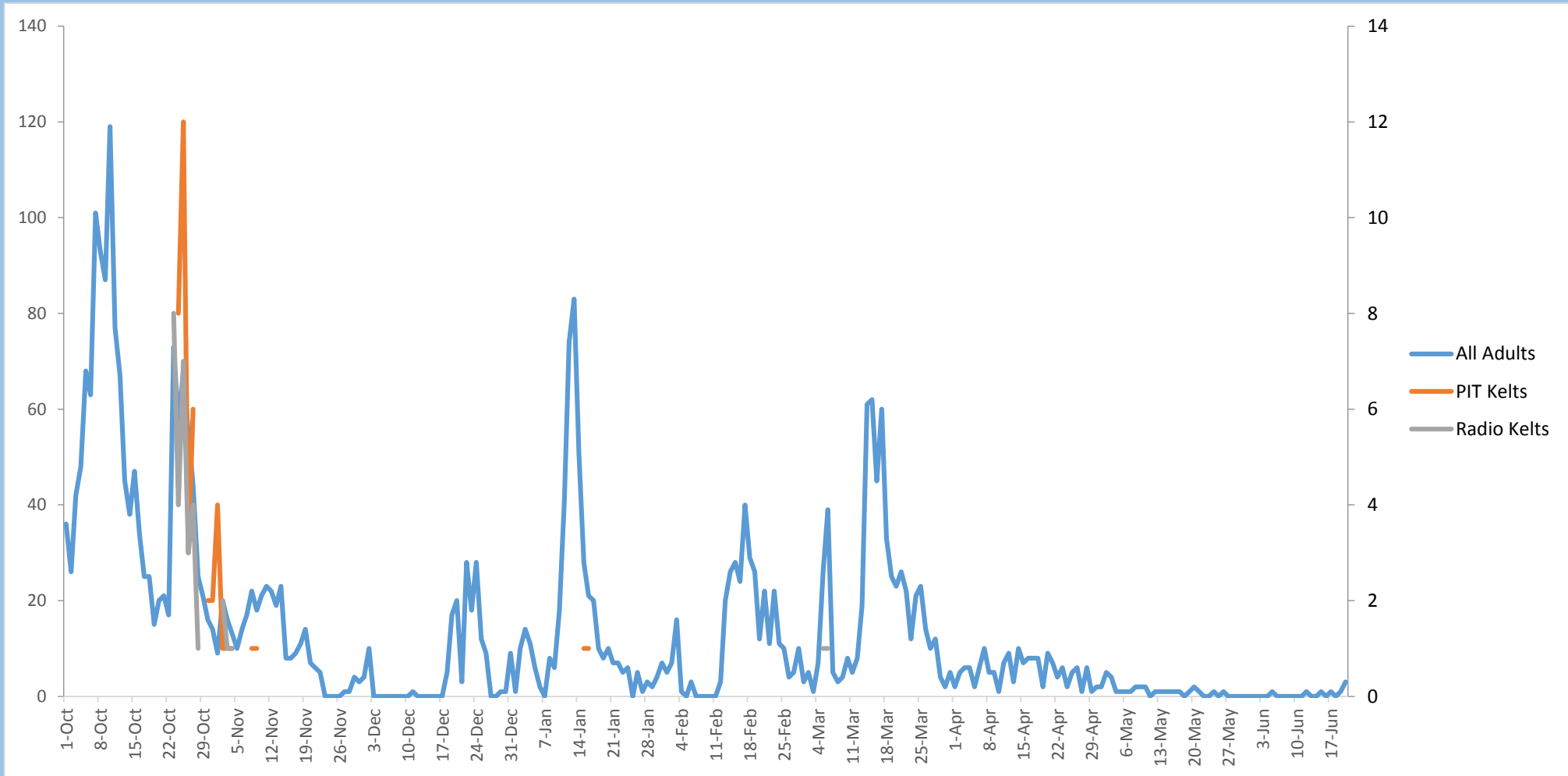
- 224 reconditioned steelhead kelts were released, 70 were radio tagged.
- Kelts were classified as rematuring based on estradiol results, except 18 with borderline or non-rematuring blood estradiol levels.
- Release occurred on Oct. 23, 2013 into the Yakima River below Prosser Dam.



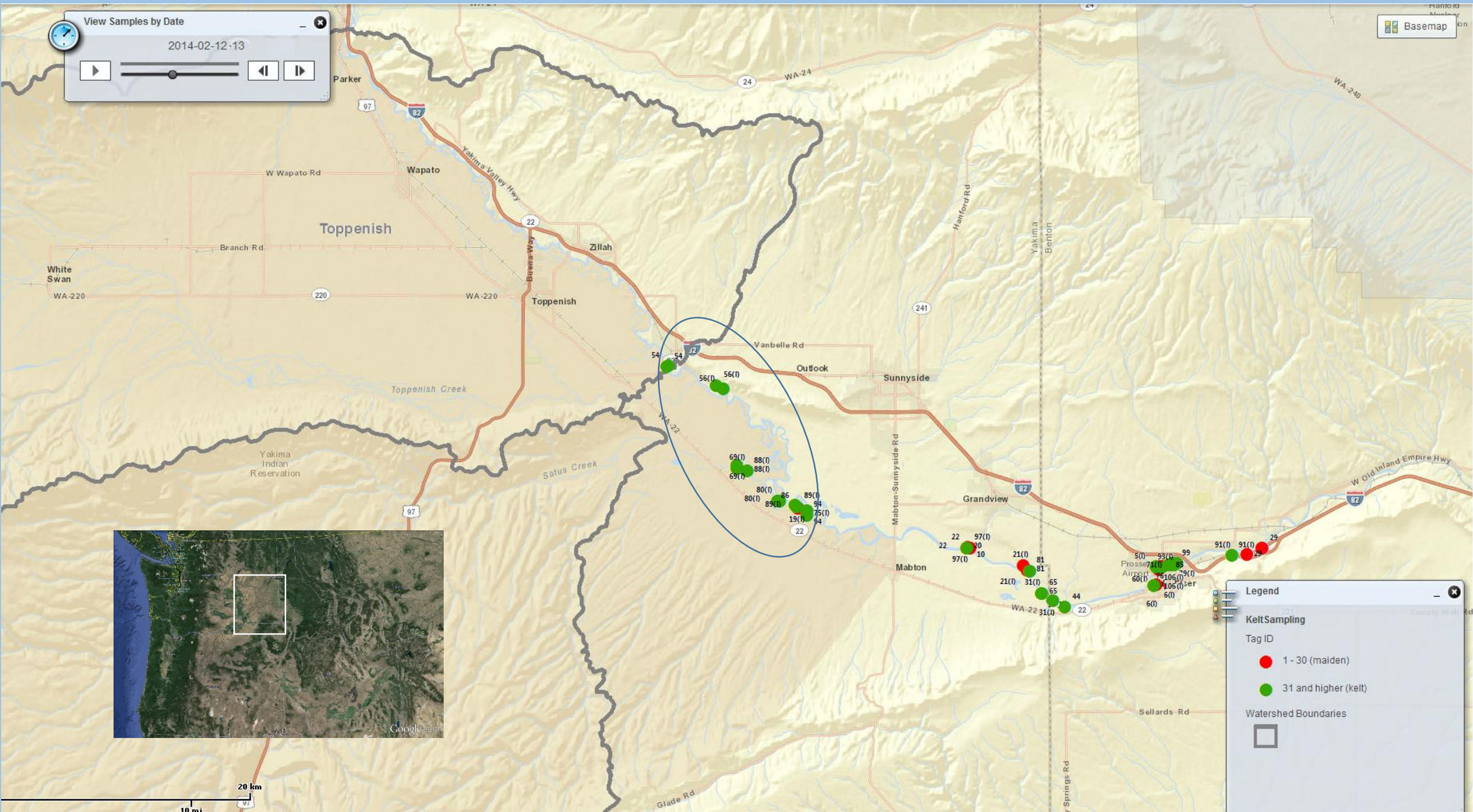
Kelt detection post release in mainstem Yakima River



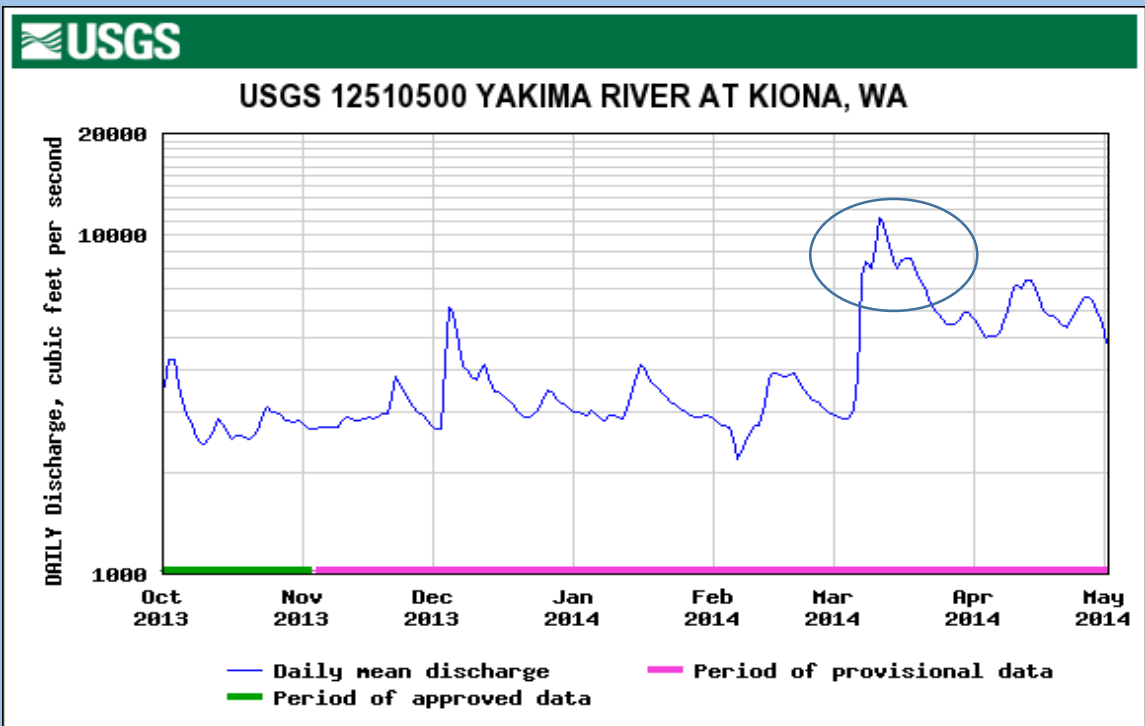
Migration timing Over Prosser



- Most radio tagged fish held at the Satus Bar (blue circle) during winter before moving in the spring.

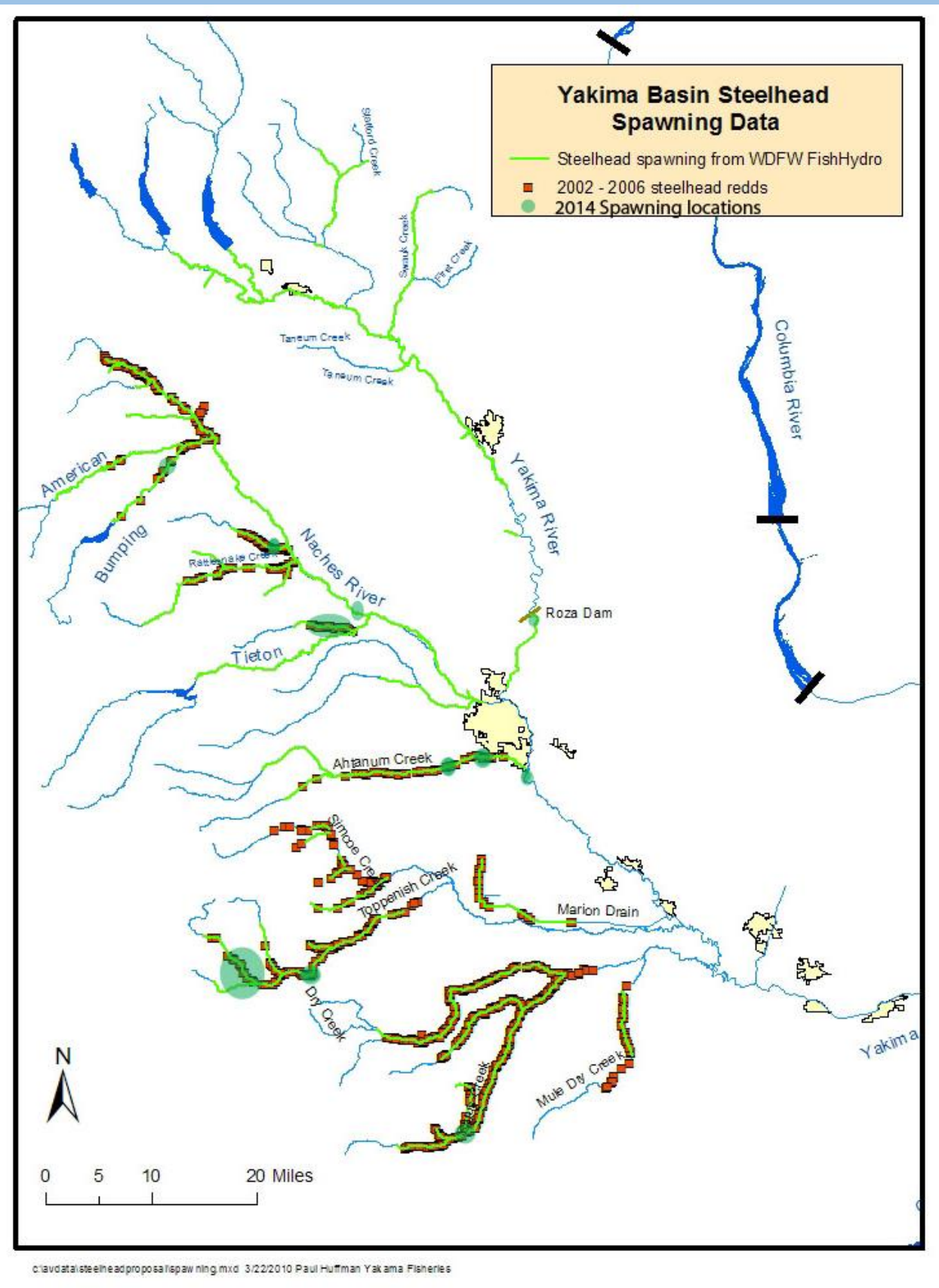


- Movement into spawning tributaries began during the spring freshet (circled).

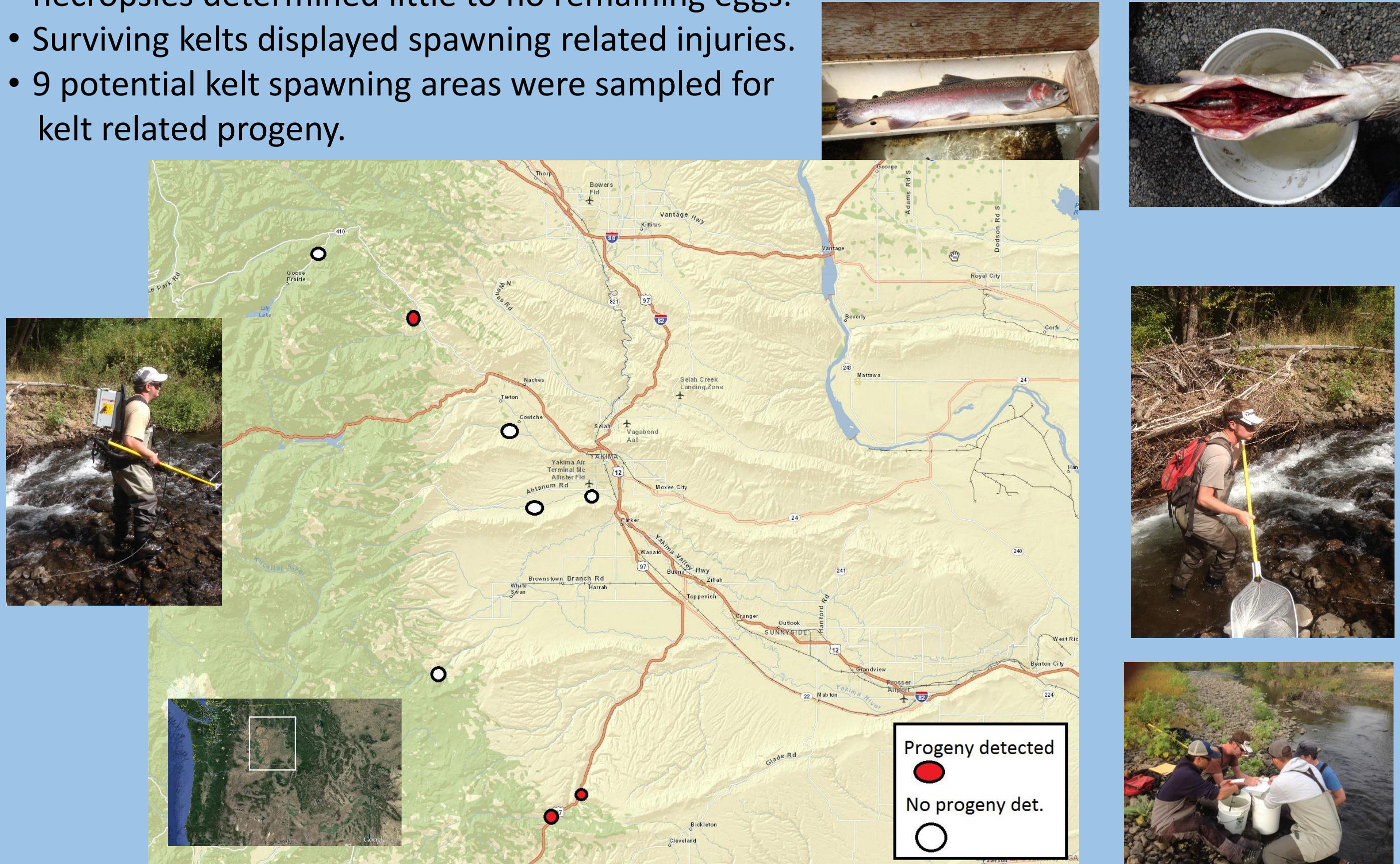


Spawning Tributary Detection 2013/14

Stream	Number Detected
Satus	13
Toppenish	13
Ahtanum	2
Cowiche	2
Naches/Upper Yakima	
Below Roza Dam	10
Nile Creek	2
Bumping River	1
Upper Yakima above Roza Dam	3
Total spawning tributary detection	46 (21%)



- 11-kelts (50%) with prior detection histories were detected migrating into to the same stream from prior year (2012/13).
- Kelts returned to tributaries within 2-weeks of previous year's detection timing.
- Tributary entry to redd construction averaged 1-3 weeks.
- Spawning duration was 2-5 days.
- Kelts left tributary 1-2 days after spawning.
- 8 kelts were recaptured at Prosser and reconditioned. Two of these were mortalities and necropsies determined little to no remaining eggs.
- Surviving kelts displayed spawning related injuries.
- 9 potential kelt spawning areas were sampled for kelt related progeny.



- 3 sites produced juvenile progeny that were genotyped back to kelt parents W-141-17 (Stephenson).

Conclusions

- Reconditioned kelts have high fidelity to previous spawning tributaries.
- Reconditioned kelt spawn timing remains close to previous spawn timing (2wks).
- Migration patterns and physical cues suggest that kelts are spawning.
- Parentage analysis confirms that kelts are successfully producing progeny in the wild.