

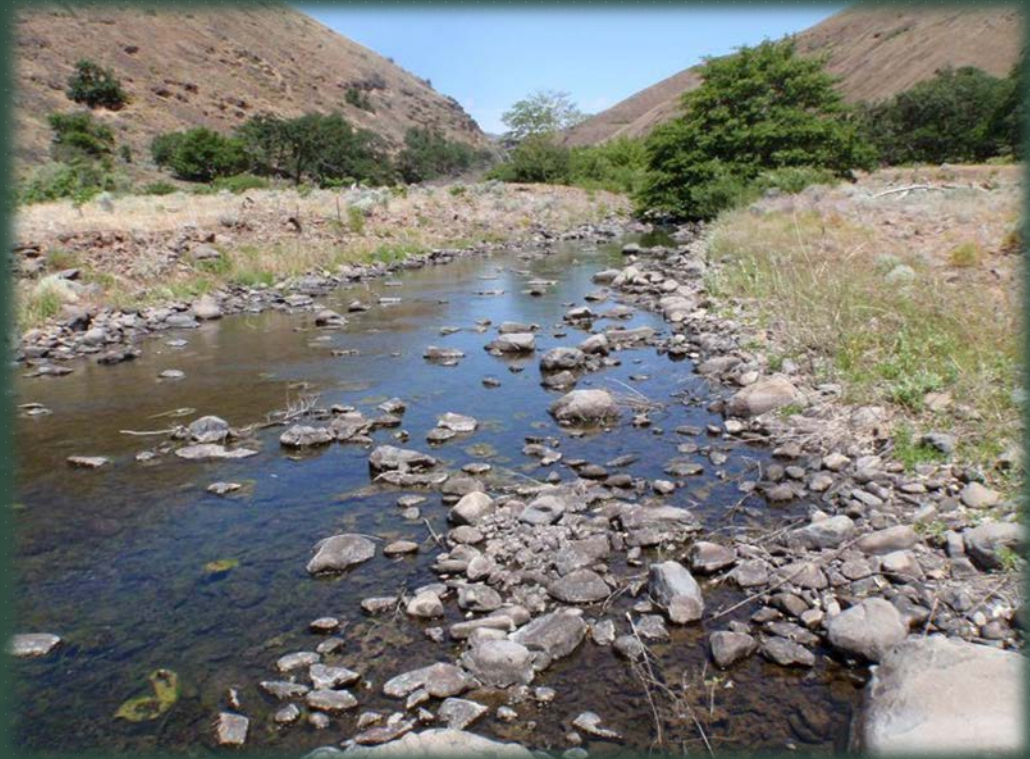


# Fish Distribution and Population Dynamics in Rock Creek WA

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# Study Site

- 16 inches of rain/year
- 21 km upstream of John Day Dam
- Intermittent flow down low
- Grazing, rural residential, commercial timber

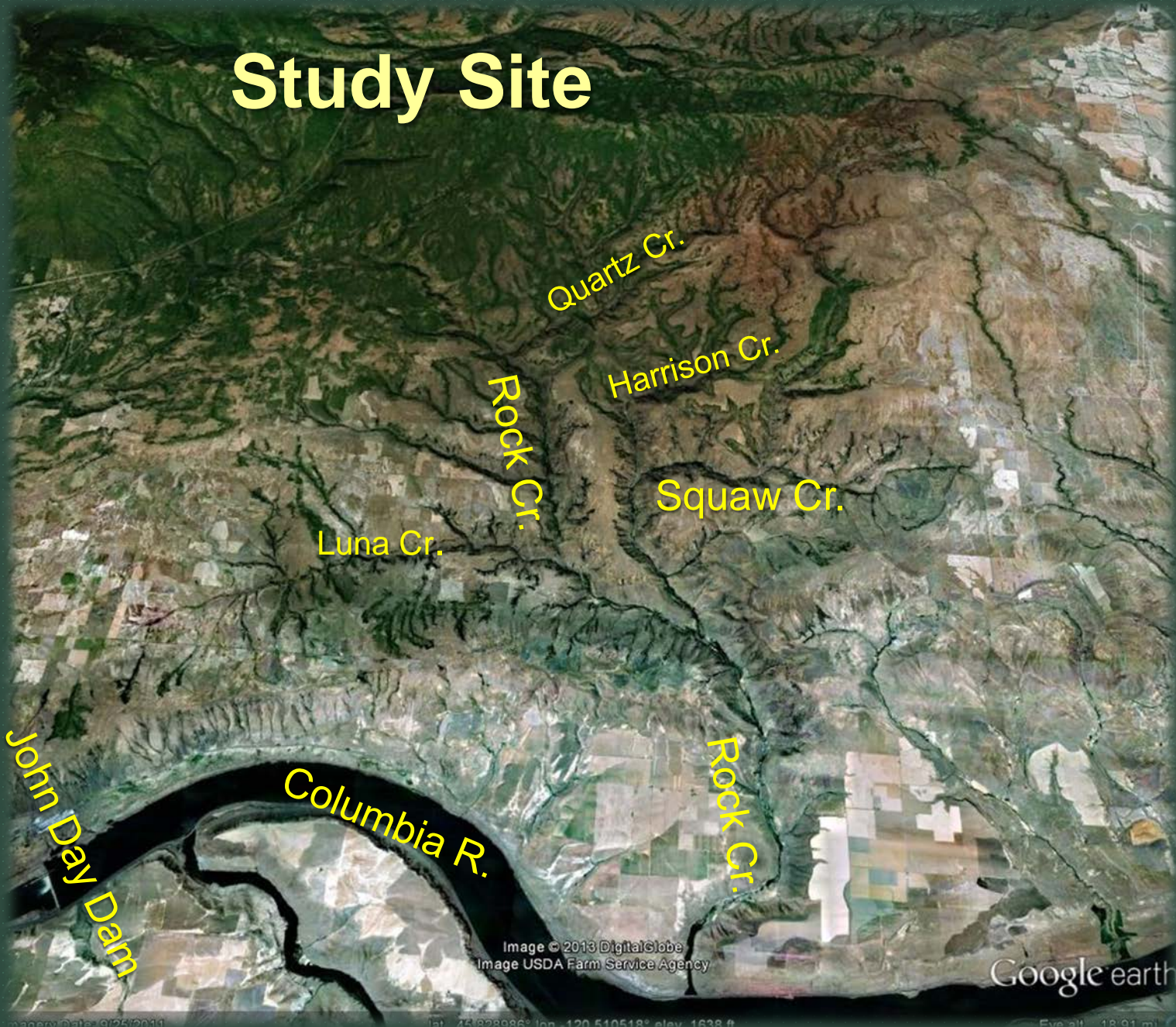


Image © 2013 DigitalGlobe  
Image USDA Farm Service Agency

Google earth

imagery Date: 9/25/2011 lat: 45.928986° lon: -120.510518° elev: 1638 ft Eye alt: 18.91 mi

# Habitat

- Census of lengths of pools, wet riffles, dry riffles –

Rock Cr. from rkm 2 to 23,  
Squaw Cr. from rkm 0 to 8

- If pool- record length, width, ave. depth, max. depth



Photo by J. Burkhardt



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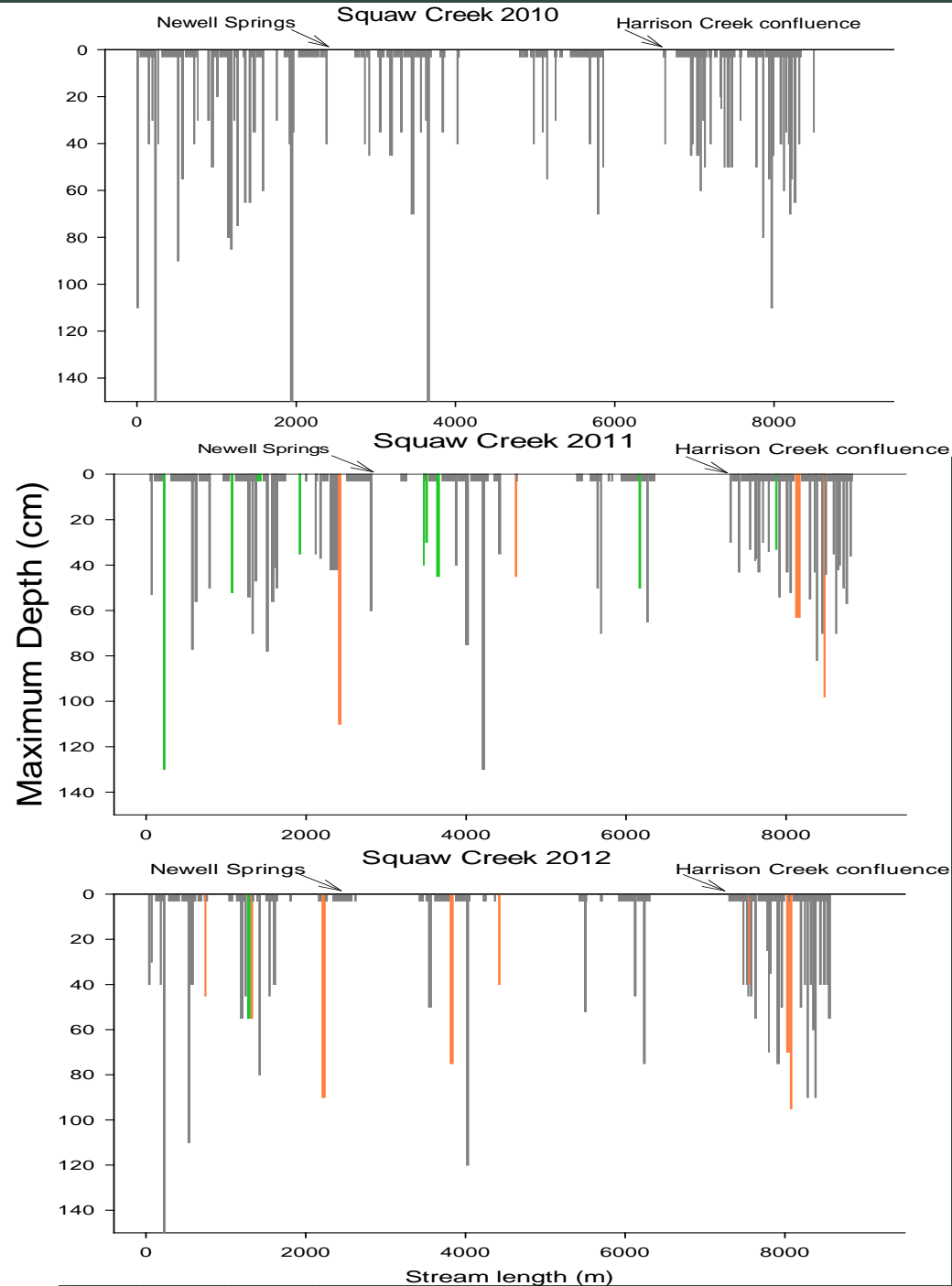
Photo by J. Burkhardt



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# Habitat Results Squaw Cr.

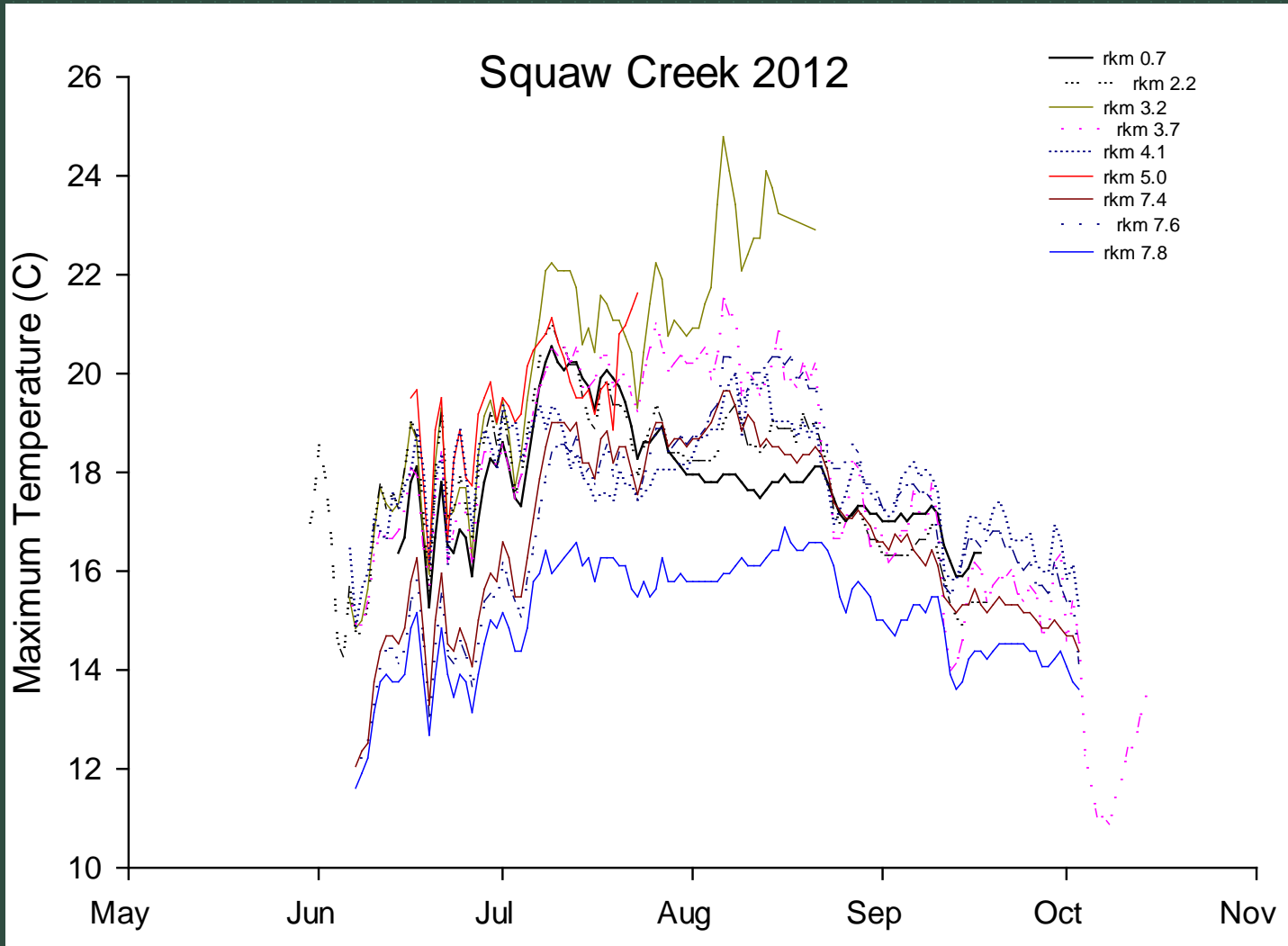
	2010	2011	2012
% dry	42	29	53
% pool	15	13	10
No. pools	72	56	45
Pools/100 m	0.9	0.6	0.5
Avg. max depth (cm)	53	54	58



# Temperatures

## Rock and Squaw Cr.

- 18 therms deployed
- Max 24.4 at rkm 4.8
- Most sites 21 °C or less



# Electrofishing



- Started fall of 2009
- Spring 2010
- Spring and fall 2011 and 2012 (pop. est.)





# Species composition





# Species composition and distribution

- Steelhead, shorthead sculpin, speckled dace
- Redside shiner, bridgelip sucker
- Coho (in 2011) and Chinook (rkm 2.1) salmon
- Northern pikeminnow, smallmouth bass, brown bullhead (rkm 17.5)



# Population estimates

$$N = [(M + 1) * (C + 1) / R + 1] - 1$$

$M$  = number of fish marked on the first sample,

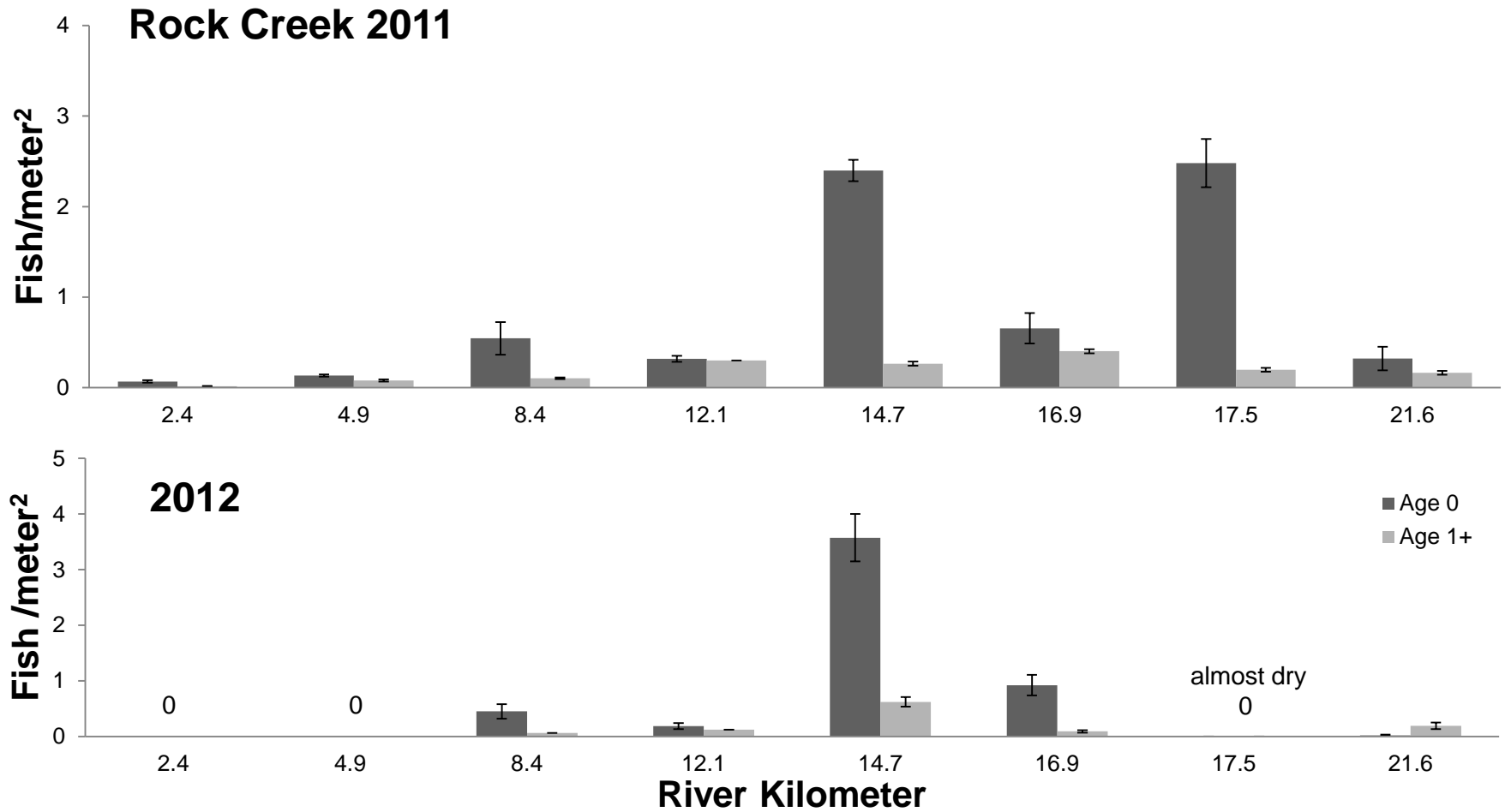
$C$  = number of fish captured in the second sample

$R$  = number of marked fish captured in the second sample

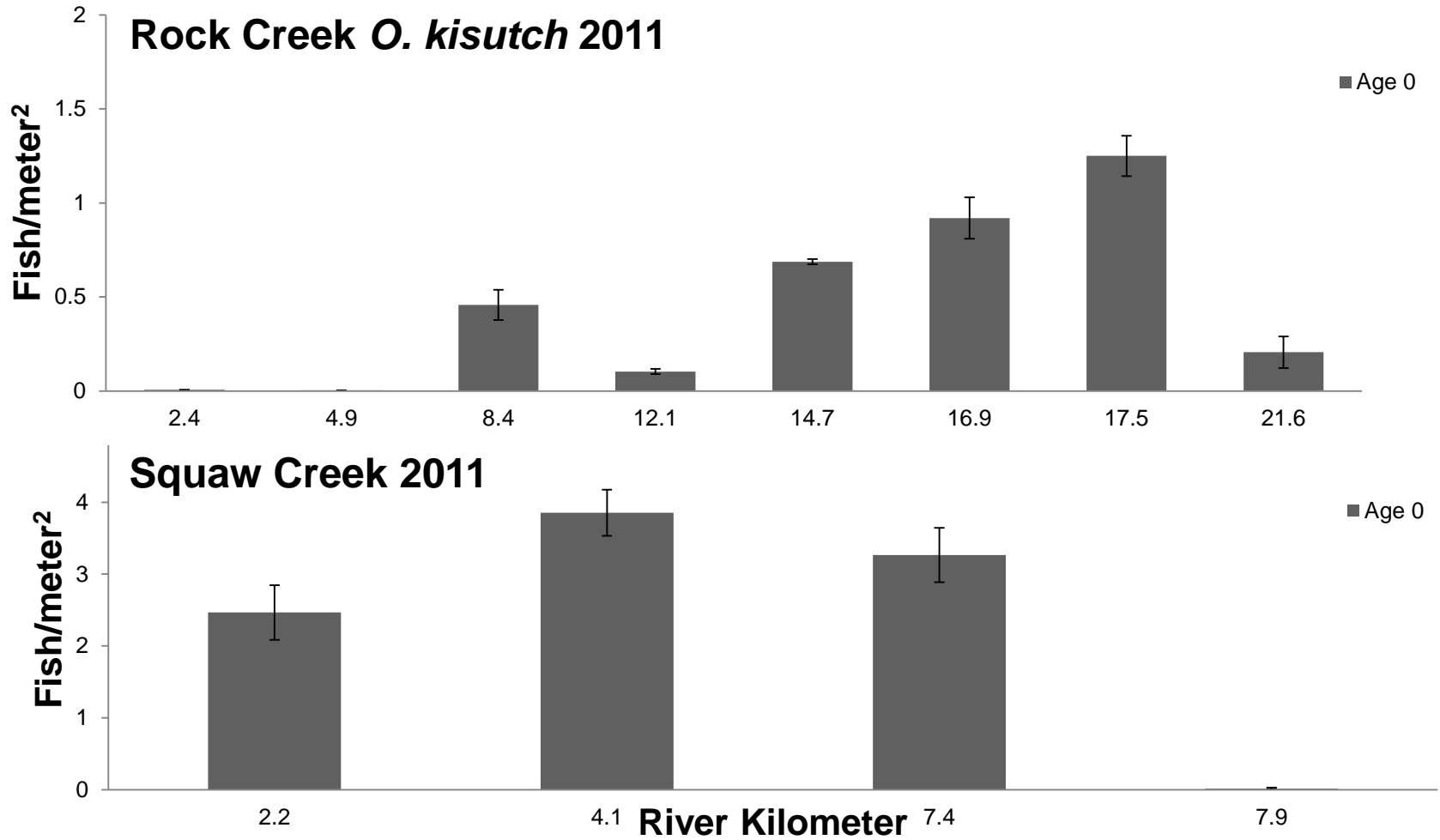


Photo by J. Burkhardt

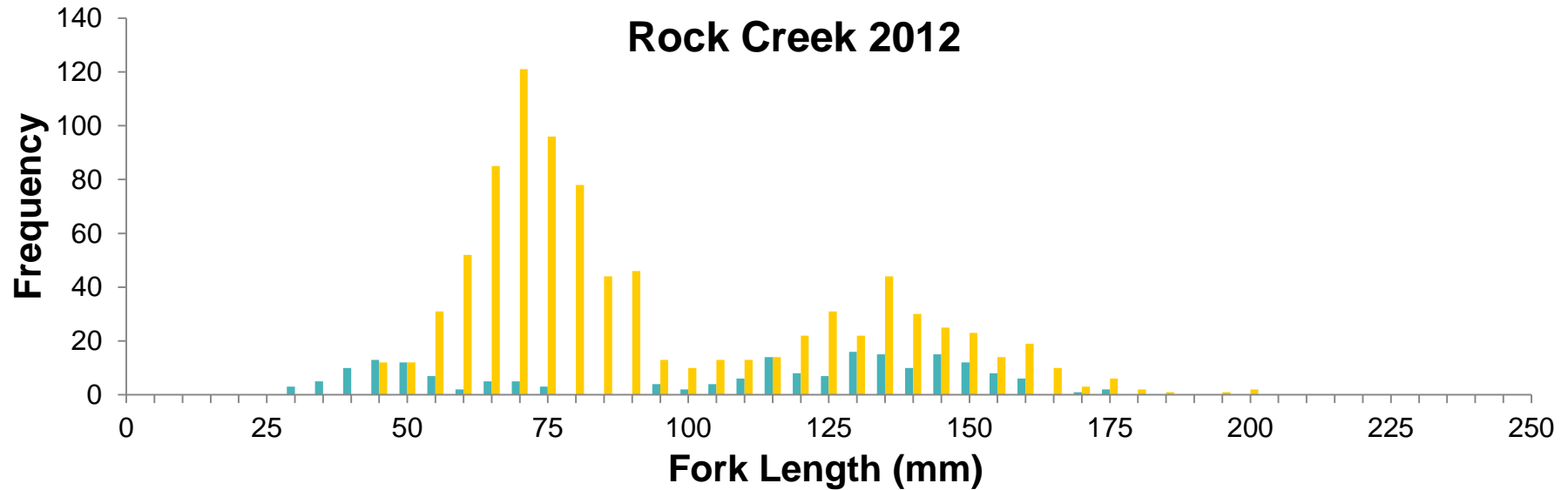
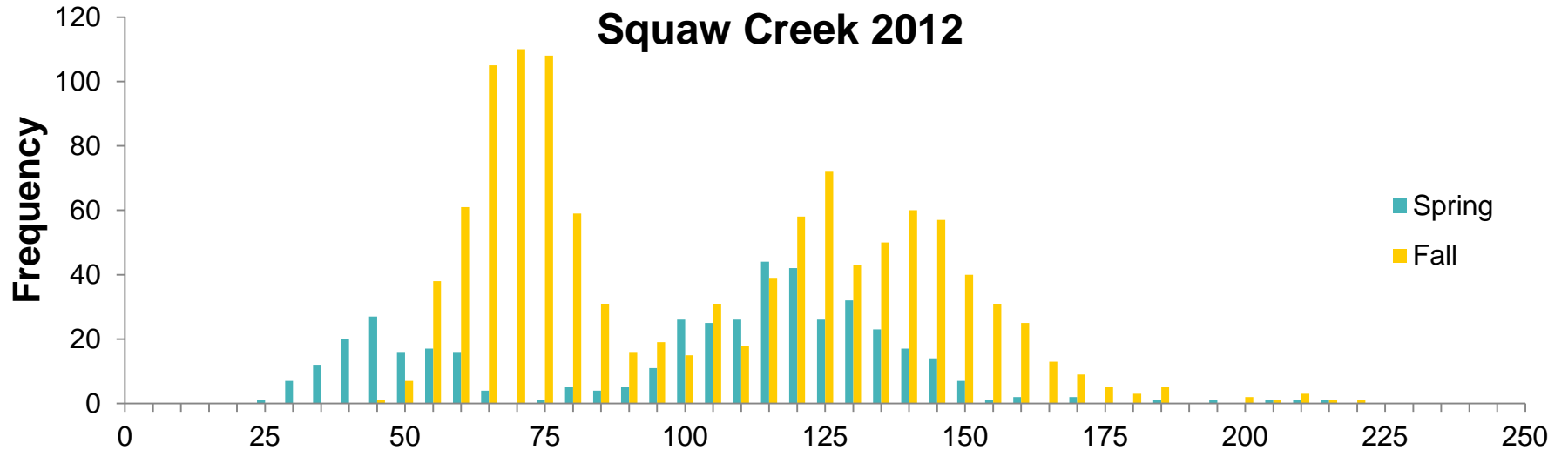
# Steelhead abundance



# Coho salmon abundance



# Steelhead length frequency



# PIT tag interrogation systems

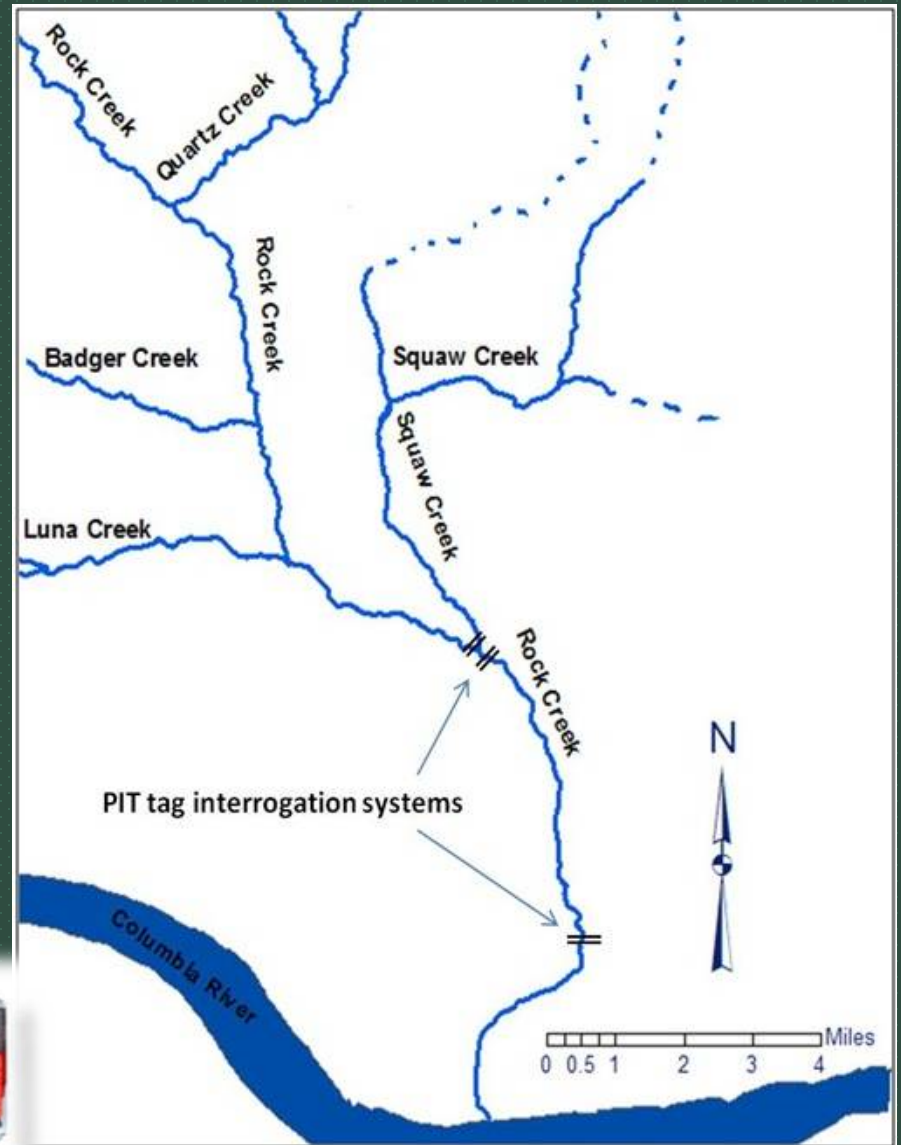




Photo by Loren Meagher

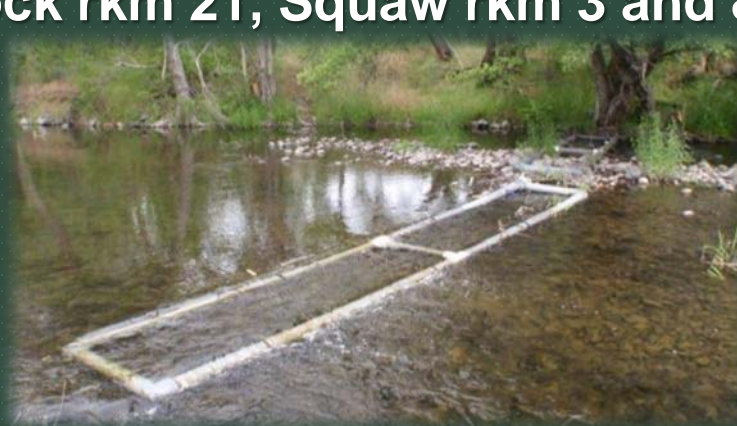


# PIT tagging and detections

Year	# tagged	# detected	RCS	RCL
2009 Fall	555	198 (36%)	182	174
2010 Spring	102	27 (26%)	19	15
2011-O. mykiss	1046	239 (23%)	114	179
-Coho	148	61 (43%)	32	47
2012	1200	30 (3%)*	25	5

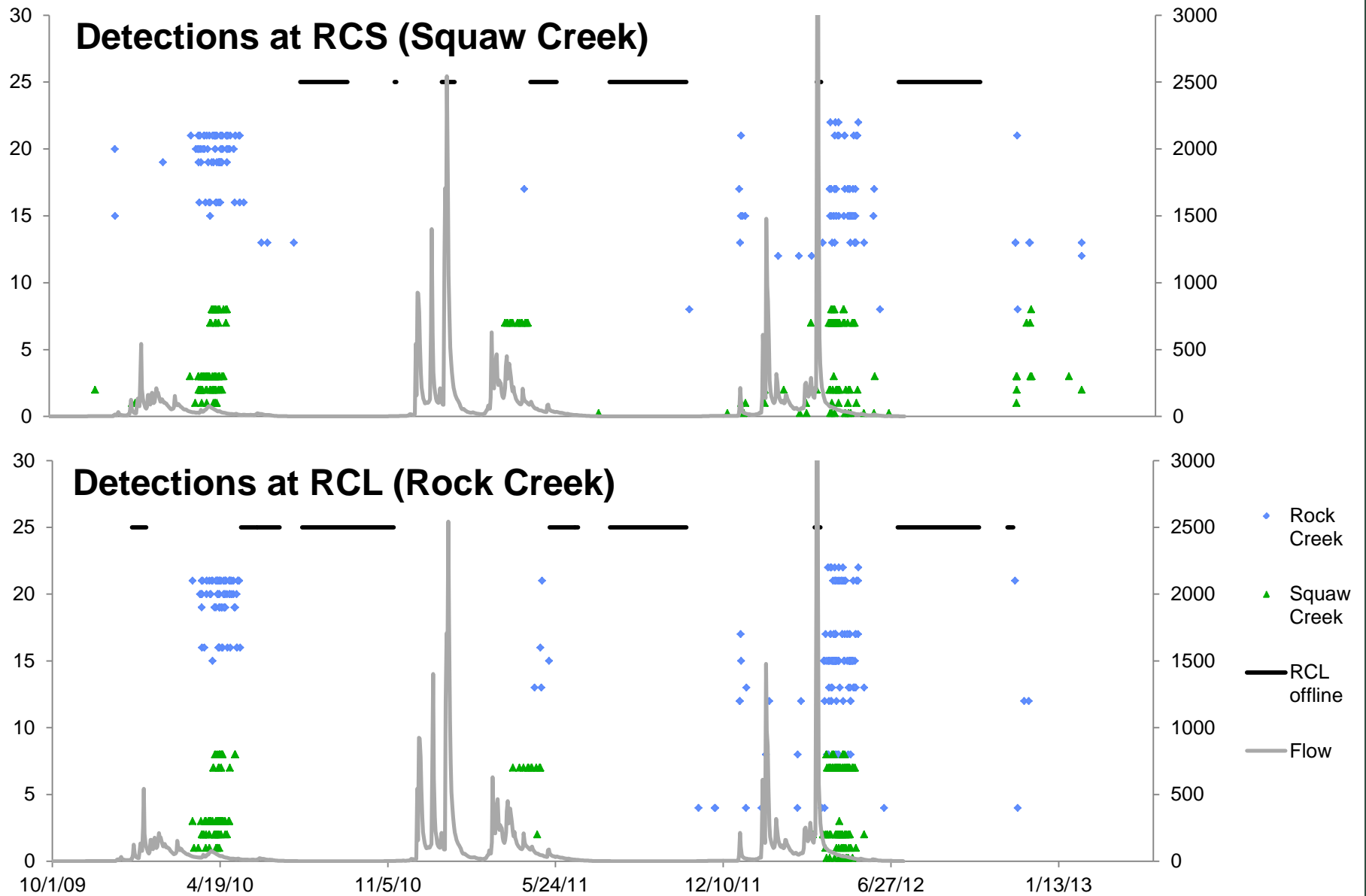
\* Tagged fish smolt in March and April, 0.9 days from RCS to RCL (1.9 d for coho); 6 d to JDJ (median)

- **3 adults tagged as juveniles have returned- all tagged Oct 2009 – Rock rkm 21, Squaw rkm 3 and 8**





# PIT Tag Detections



# Adult Steelhead detected in Rock Cr.

- 40 adult steelhead detected - 22 tagged as juveniles, 18 as adults
- 22 tagged as juveniles – 3 Rock/Squaw Cr. (tagged 2009),  
73% are Snake R. origin – 11 barged from LGR, 5 at hatcheries.  
2 at John Day Dam, 1 at Deschutes River
- 24 (60%) traveled 100 km through Mc Nary (mostly Aug. – Oct.), 7 did it twice, 2 through Ice Harbor Dam, 2 through Priest Rapids Dam



# Acknowledgements

- Thanks to private landowners
- Yakama Nation and Bonneville Power Administration
- YN fisheries technicians and volunteers – Sonia Jackson, Bronso Jim Jr., Alena George, Jeanette Burkhardt, Joe Zendt, Ralph Harvey, Andrew Matala (CRITFC)
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Photo by P.J. Connolly



Photo by J. Burkhardt