

Is Freshwater Reconditioning of Kelts Effective in Enhancing Iteroporous Spawner Abundance in the Yakima Basin

Jeff Trammell - YKFP



Bonneville
Power Administration

At a Glance
Environment,
Fish & Wildlife

Background

A photograph of a stream flowing over a bed of colorful pebbles. The water is clear, and the pebbles are in various shades of brown, orange, and grey. Green plants are visible on the banks.

- YBFWRB estimate historic populations to range from 20k – 100k

- DART reveals 10-yr average of 3,700

- Hockersmith *et al* (1995) estimated 1.6% kelt returns '89-'93.

- 1999 ESA listing – enhance survival of iteroparity life history

Yakama Program

Treatments

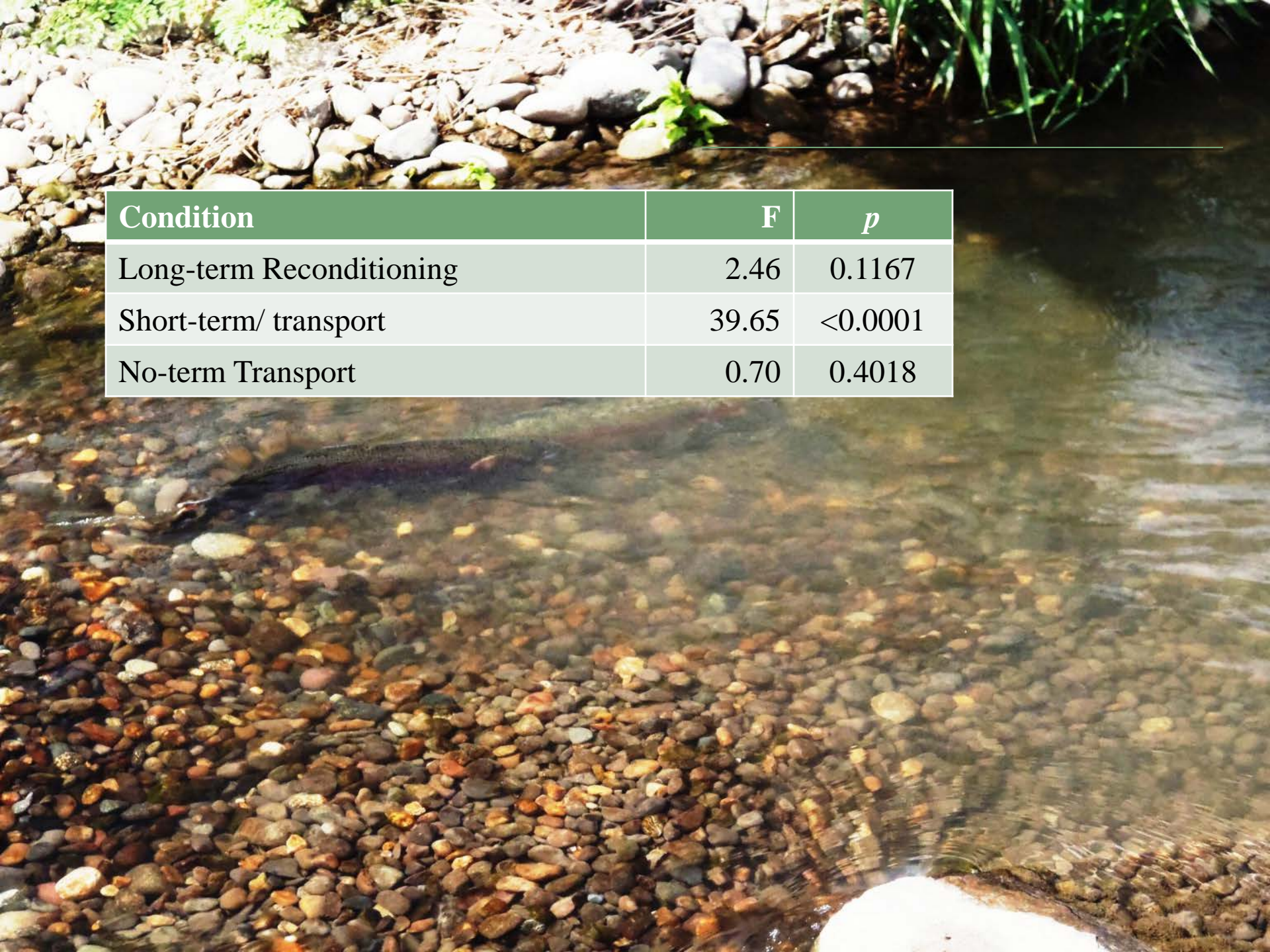
- ⦿ Long-term reconditioning
- ⦿ Short-term/ transport
- ⦿ Direct Transport

- ⦿ H_0 : There is no significant increase in the rate-of-returning kelts from the treatment groups over the control group.

Analysis

Weights	F	<i>p</i>
Long-term Reconditioning	3.52	0.0608
Short-term/ transport	25.48	<0.0001
No-term Transport	0.01	0.9171

Lengths	F	<i>p</i>
Long-term Reconditioning	0.77	0.3797
Short-term/ transport	0.13	0.7196
No-term Transport	1.40	0.2362

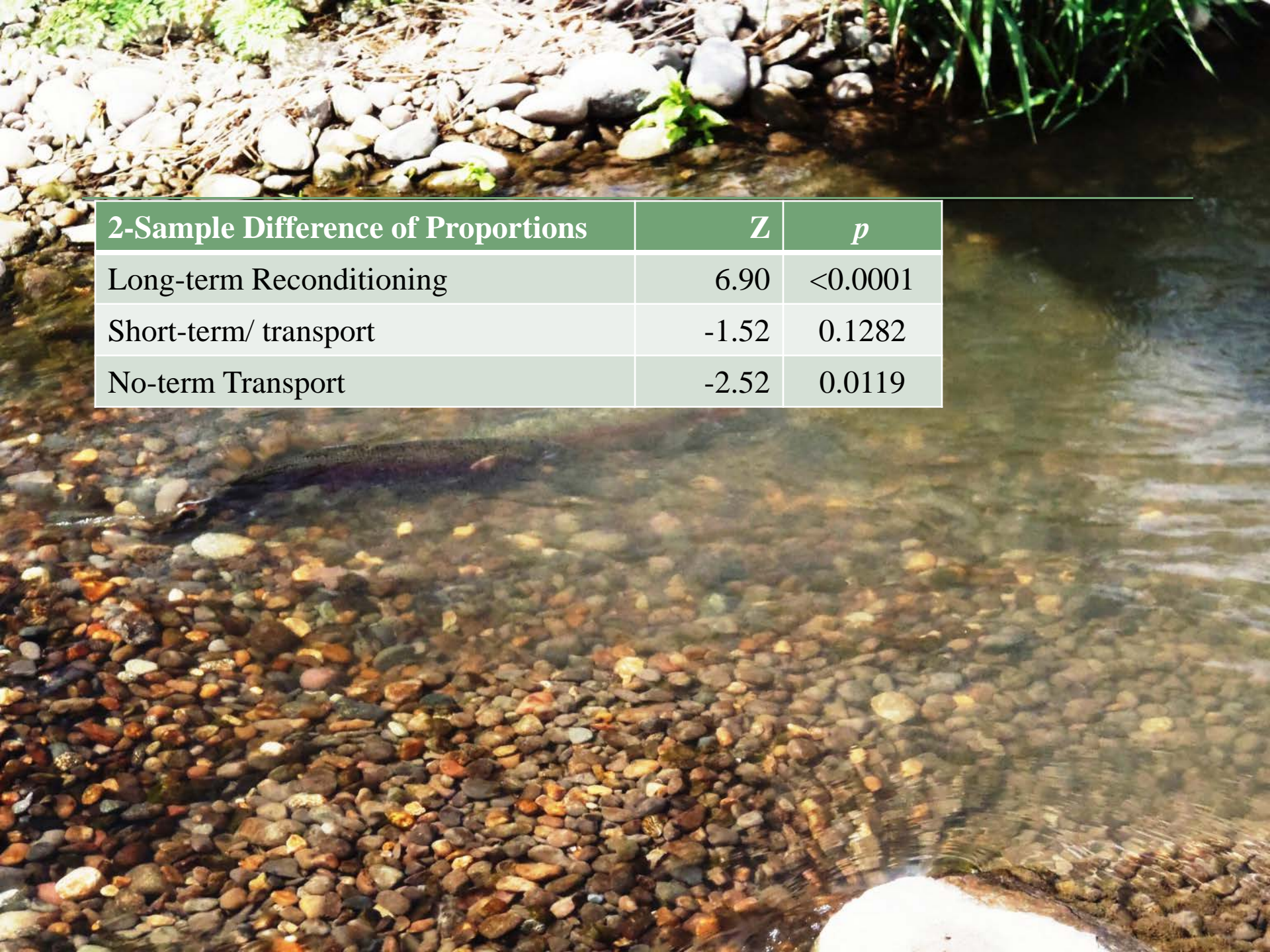


Condition	F	<i>p</i>
Long-term Reconditioning	2.46	0.1167
Short-term/ transport	39.65	<0.0001
No-term Transport	0.70	0.4018

Number of kelts released, number of PIT-tagged fish and percentage of release detected at Prosser Dam.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	<u>Pooled</u>
Reconditioned											
N							472	510	1106	617	2705
D							91	46	153	58	348
RR							19.3%	9.0%	13.8%	9.4%	12.9 %
Short-Term Reconditioned Then Transported											
N	479	208	105	105	100	40	108				1145
D	6	1	4	0	0	1	5				17
RR	1.3%	0.5%	3.8%	0.0%	0.0%	2.5%	4.6%				1.5 %
Transported											
N			63	96	49	38	100		235	186	767
D			1	0	1	0	1		2	1	6
RR			1.6%	0.0%	2.0%	0.0%	1.0%		0.9%	0.5%	0.8 %
In-River release											
N				67	53	53	80	58	155	85	551
D				3	1	1	4	2	1	3	15
RR				4.5%	1.9%	1.9%	5.0%	3.4%	0.6%	3.5%	2.7 %

(N is the total sample size for that year. D is the total PIT-tag detections observed at Prosser Dam. RR is the calculated rate-of-return based on those detections, RR = N/D.



2-Sample Difference of Proportions	<i>Z</i>	<i>p</i>
Long-term Reconditioning	6.90	<0.0001
Short-term/ transport	-1.52	0.1282
No-term Transport	-2.52	0.0119

Related Studies

- Keefe *et al.* (2008) – sampled mainstem fish with kelts accounting for 0.5-1.2% of fish
 - John Day, McNary, and Lower Granite Dams
 - 2001-2004
- Evans *et al.* (2008) – transportation of kelts collected from Columbia and Snake mainstem dams
 - No significant difference in John Day group
 - LGR in-river = 0.65%, transport = 1.38%

Further Research

- Male vs. Female
- Relative reproductive success rate
 - First time spawners, kelts, resident trout
- Management of skip spawners
- What are the implications of favoring this life-history trait?

Questions?