

Klamath Tributary Fish Passage Improvement Project



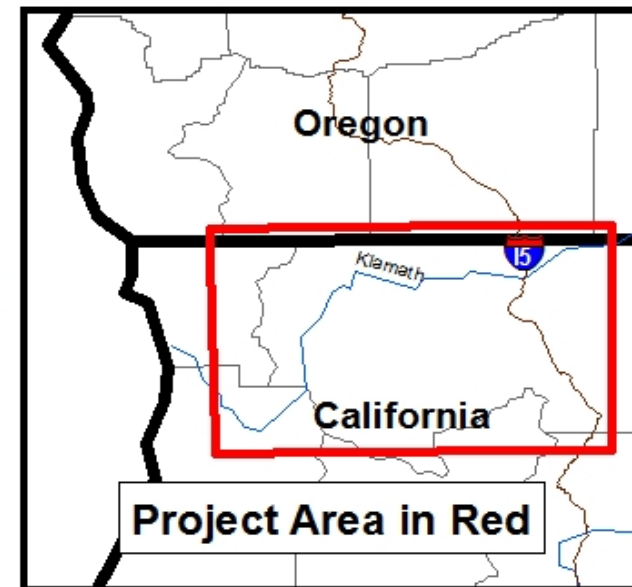
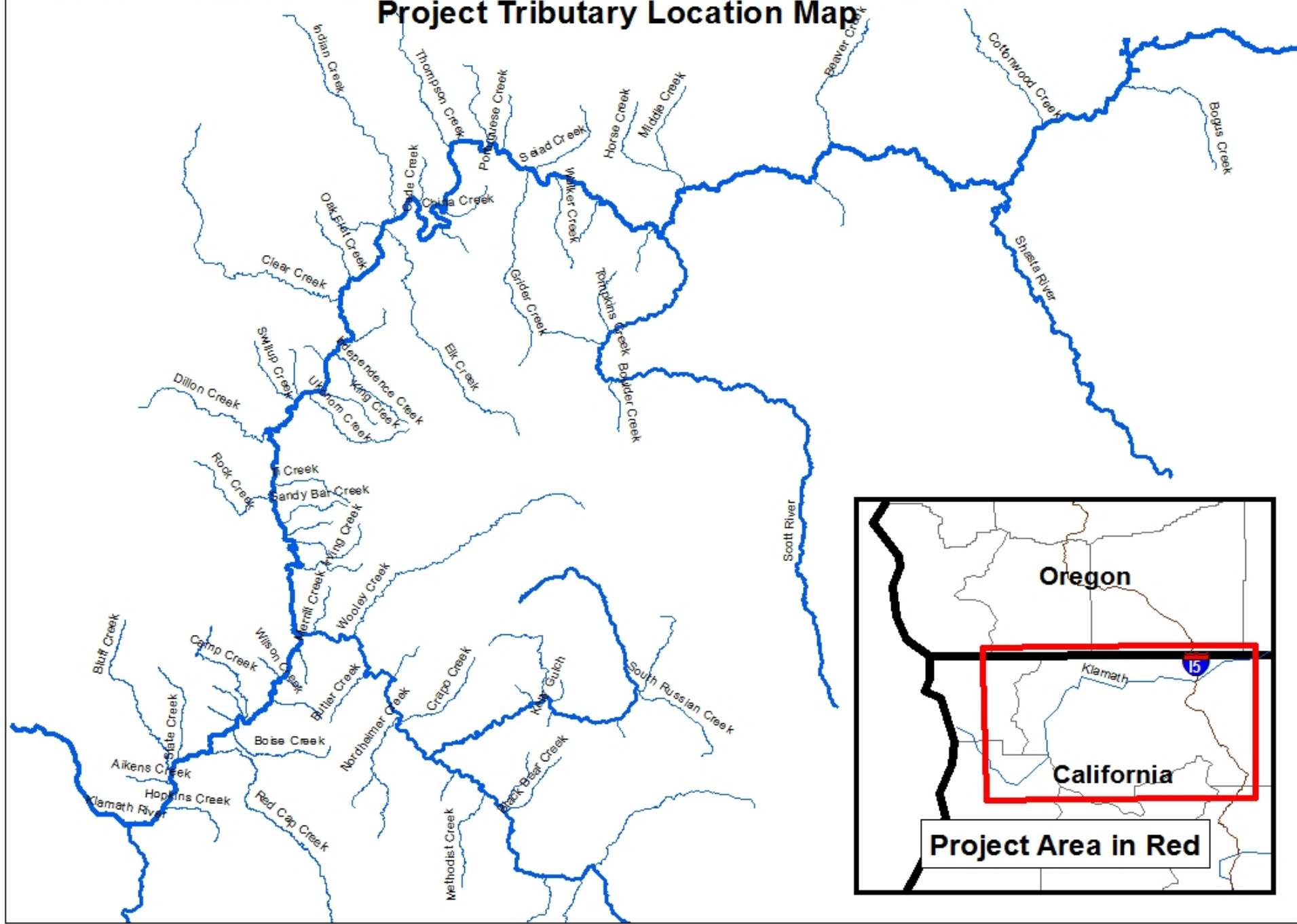
2012-2013 Field Season Results



Objectives of Project

- **Monitor and maintain fish passage on the lower reaches of approx. 80 anadromous tributaries (over 200 stream miles) between Iron Gate Dam and the mouth of the Trinity on the Klamath River, the lower Scott River and the Salmon River.**
- **Create site-specific modifications that benefit adult and juvenile fish passage, while prioritizing connectivity to critical refugia and rearing habitat for SONCC listed coho salmon.**
- **Conduct before and after treatment snorkel surveys to quantify project results.**
- **Record temperature, gradient, depth, photopoints and maintain a project database to characterize fish passage issues by tributary over time (project has been ongoing since 2006).**

Klamath River Tributary Fish Passage Improvement Project, Project Tributary Location Map



Assessment

- When late spring flows allow, MKWC and project partners conduct an assessment of juvenile and adult fish passage on all tributaries within the project scope.
- Barriers are identified, qualitative features recorded and on-site prescriptions are made.
- Barriers are characterized as either boulder/bedrock cascade, log-jam, low flows/shallow conditions, velocity barrier, or excessive jump height.
- Additional data collected within the assessed tributary reach include channel width, depth, gradient, flow, cover and temperature (air, tributary at mouth and out of Klamath floodplain, Tributary/Klamath mixing area and mainstem Klamath above tributary influence).
- On-site prescriptions are made concurrent with tributary assessments.

Tx Rank (Group)	Tributary	Mainstem River Mile	Signif. Fish Trib	Barrier Type								Species Affected						Easy Fix Feasibility	Status of Barrier		Barrier Location					Habitat Above Barrier		
				Barrier y/n	Perched Alluvium	Swimmer Dam	Cascade	Sub- Surface Flow	Road Xing	Small Debris Jam	Log Jam	STHD		COHO		CHIN			Perm.	Season	Within 100ft of Mouth	100' - 1500'	1500' - 5000'	>5000	<300'	300' - 1500'	1500' - 5000'	
												Adult	Juv.	Adult	Juv.	Adult	Juv.											
7	Aikens	48.77	y	n		x	x						x	x	x	x	x	n	x				x					
	Aubrey		y	y					x	x			x		x		x	y/n	x	x		x				x		
	Beaver		y	n																								
	Bluff	49.65	y	y																	x					x		
	Bogus		y	n																								
Monitor	Boise	55.69	y	y																x	x					x		
	Boulder	Scott River	y	y														n										
	Cade	110.50	y	y	x	x			x	x			x	x	x	x		y		x	x	x				x		
Monitor	Camp	57.16	y	y	x	x							x	x	x	x	x	y		x	x					x		
	China	119.20	y	y	y		y						x	x	x	x	x	x	y	x	x	x				x		
1	Clear	99.66	y	n		x																						
10	Coon	90.02	y	y			x			x			x	x		x		x	n	x		x				x		
	Cottonwood																											
8	Crawford (Humboldt)		y	y			x			x				x		x		n	x		x					x		
	Crawford (Siskiyou)		n	y						x				x				n	x		x							
2	Dillon	85.14	y	n																								
	Deep	Scott River	n	y														n										
Monitor	Elk	106.73	y	y		x				x			x	x		x	x	x	y		y		x			x		
7	Elliot	87.95	y	y	x					x				x		x		y		x	x	x				x		
3	Fort Goff	127.95	y	y	x	x				x			x	x	x	x	x	x	y/n	x	x		x			x		
8	Grider Creek	131.81	y	n																								
	Horse		y	n																								
	Humbug		y	y					x									n										
	Ikes		n	y			x			x				x				n	x		x							
	Independence	94.96	y	n																								
4	Indian	107.95	y	n																								
9	Irving	75.72	y	y			x						x	x	x	x	x	x	y	x			x			x		
2	Kings	91.48	y	y	x								x	x	x	x		x	y		x	x				x		
	Little Grider	106.97	y	y	x									x		x			y		x	x				x		
Monitor	Little Horse		y	y	x	x			x				x	x	x	x			y	x	x		x			x		
5	Little Humbug		n	y					x									n		x	x	x				x		
	Middle	Scott River	y	?														y										
	Oak Flat	101.47	y	y			x							x		x		n		x	x					x		
	O'Neil	137.00	y	y	x				x				x	x	x	x		x	y		x		x			x		
Monitor	Pearch	60.14	y	y			x							x		x		n	x		x					x		
	Portuguese	128.95	y	y	x	x			x				x	x		x		y/n		x		x				x		
	Red Cap	52.83	y	n									x	x	x	x	x	x	y		x	x				x		
	Rock	79.72	y	y			x						x	x	x	x	x	x	y/n	x	x	x		x		x		
	Rodgers	72.83	y	y			x						x	x	?	x	x	x	y		x	x				x		
	Sandy Bar	77.54	y	y	x		x		x	x			x	x		x		x	y/n	x	x	x	x			x		
5	Selad Creek	131.53	y	y		x			x							x		x	n		x					x		
	Slate	50.60	y	y					x				x	x	x	x	x	x	y		x	x				x		
Monitor	Stanshaw	76.83	y	y					x	x			x	x		x		x	y/n	x	x	x	x			x		
8	Swillup	89.62	y	n									x	x	?	x		x	y		x	x	x			x		
6	Thompson	124.42	y	n		x																						
	Thompkins	Scott River	y	n																								
	Ti	80.81	y	y	x								x	x	?	x	x	x	y		x					x		
3	Titus	96.63	y	y							x		x	x	x	x		x	y	x			x			x		
1	Tom Martin	143.50	y	y						x				x		x			n	x			x			x		
	Ukonom	90.80	y	y				x										n	x					x				
	Ullathorne	56.53	y	y				x		x				x		x			n	x			x			x		
	Walker	133.00	y	n																								
6	Whitmore	62.00	y	y	x				x	x				x		x			n		x	x	x					
4	Wilson	61.00	y	y							x								y									

Example of Tracking Spreadsheet

GREEN denotes tributaries that have been treated as of 8/15/08 YELLOW denotes tribs that need to be treated or monitored for juvenile fish passage. RED denotes tribs that need to be treated or monitored for adult fish passage.

"Monitor" denotes tribs that have a history of fish passage issues emerging after initial assessments, and need to be monitored for specific reasons, including potential for new swimmers' dams, for manual modifications to be compromised by rain events, etc.

NOTE: When scheduling workdays, group highest ranking tribs for juvenile or adult fish passage together by geographical relationship (save gas and time).

Implementation

- Barriers are treated for both juvenile and adult fish passage between May and November.
- All treatments are implemented with hand work only.
- Manually constructed step-and-pool fishways are the primary model used for modification. In some cases, flow is concentrated to maintain connectivity across large alluvial deltas.
- All implementation is done under the supervision of Toz Soto (Fisheries Biologist, Karuk Tribe), Jon Grunbaum (Fisheries Biologist, USFS Happy Camp RD), or Will Harling (Fisheries Biologist, MKWC).

Creating Low Velocity Side Channel for Juvenile Salmonids
Training at Mouth of Slate Creek - May 12, 2014





In the winter of 2005, the Camp Creek channel shifted below the Highway 96 bridge, abandoning its old, well-shaded course (at top of above photo) onto $\frac{1}{2}$ mile of bare alluvial delta. The lower $\frac{1}{4}$ mile of Camp Creek settles into a new configuration each spring and presents a new challenge for maintaining fish passage, not to mention maintaining reasonable stream temperatures. By consolidating flows and creating depth and structure with step and pool fishways and brush bundles, MKWC can ensure juvenile and adult fish passage, cover complexity and favorable temperatures throughout the summer and fall.



Before

Horse Creek
Fish Passage
Summer 2013

Manually
breaching a log
jam for adult and
juvenile fish
passage



After

Juvenile and
adult coho found
above log jam
after treatment

Fish Passage at the mouth of Red Cap Creek – Summer 2013. MKWC employed 10 local youth interns creating fish passage and brush bundles for a total of 22 days this season.



Effectiveness Monitoring

- Includes photo point documentation before during and after site treatments, video documentation on select sites to document treatment methods, recorded changes in slope, barrier height, flows, temperature, channel and pool depth.
- Biological monitoring includes snorkel surveys to enumerate salmonid use above and below barriers, before and after site treatments.
- Annual Forest Service, MKWC, and Karuk Tribe fall Chinook spawning data is used to monitor adult Chinook passage in treated tributaries, and MKWC and the KTFP perform coho spawning surveys from December through January to monitor adult coho passage on select tributaries.
- All tributaries were assessed for barriers, treated, and monitored for structural integrity throughout the field season.

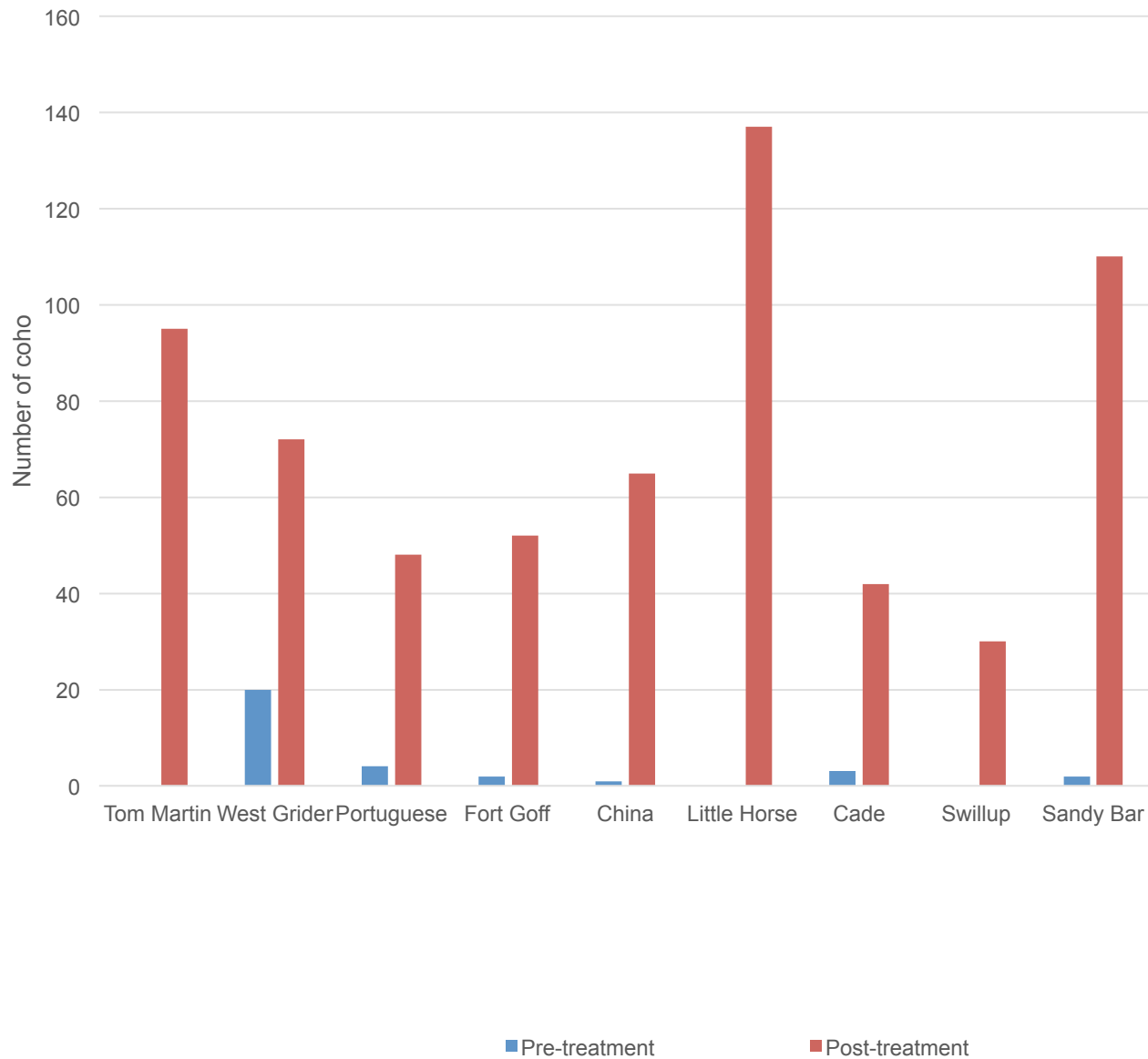
2013 Accomplishments



- MKWC and partners manually treated 65 identified juvenile salmon migration barriers on 47 of 75 assessed tributaries. In addition, 19 tributaries were treated for adult fish passage issues in the fall.
- Of the 47 treated tributaries, 42 were monitored before and after treatment for salmonid presence above and below treated barriers.

2013 Klamath Tributary Fish Passage Success Stories

Number of Coho Present Above Barriers Before and After

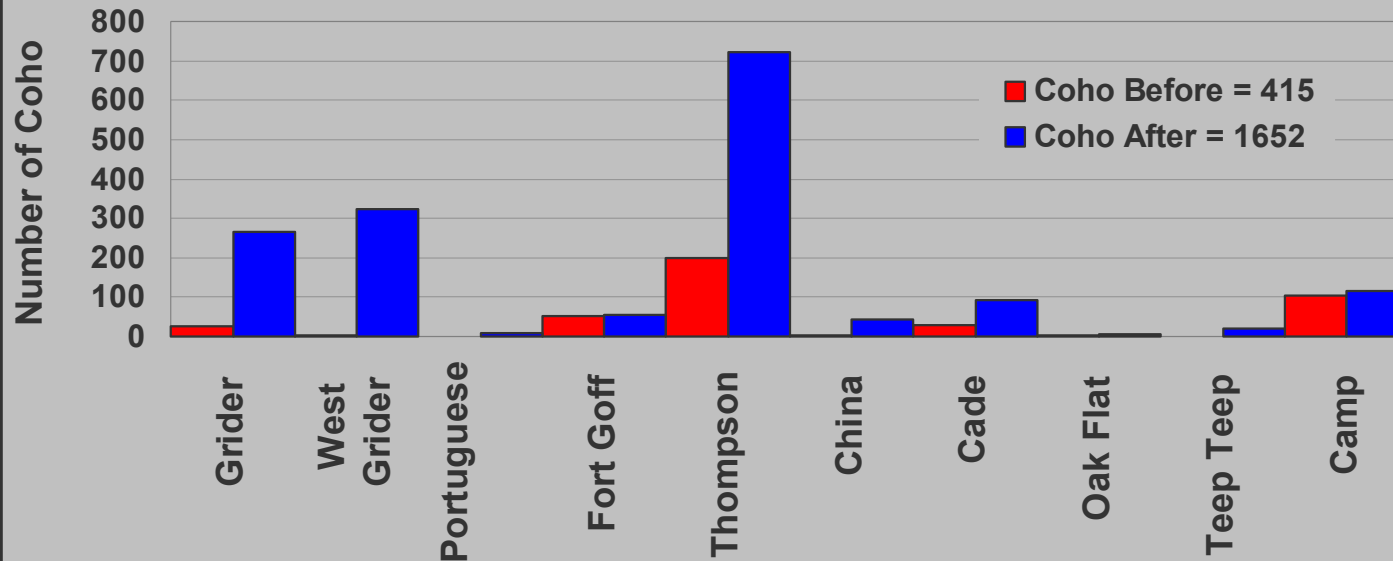


2012 Accomplishments

- MKWC, KTFP, and SRRC assessed a total of 81 tributaries for salmonid migration barriers within the first 1,000 feet of each tributary mouth.
- Of these tributaries, 72 were determined to have either juvenile or adult migration barriers within the first 1,000 feet above their mouths, for a total of 103 barriers.
- The majority of identified barriers were either perched alluvial sills or bedrock/boulder cascades at the creek mouths.
- 152.41 miles of suitable coho habitat was made accessible upstream of treated sights in 2012

** Based on Klamath National Forest GIS coho layer and from data gathered between 2002 and 2012 by Six Rivers National Forest, Orleans Ranger District, Klamath National Forest, Happy Camp Ranger District and the Karuk Tribe, DNR – Fisheries*

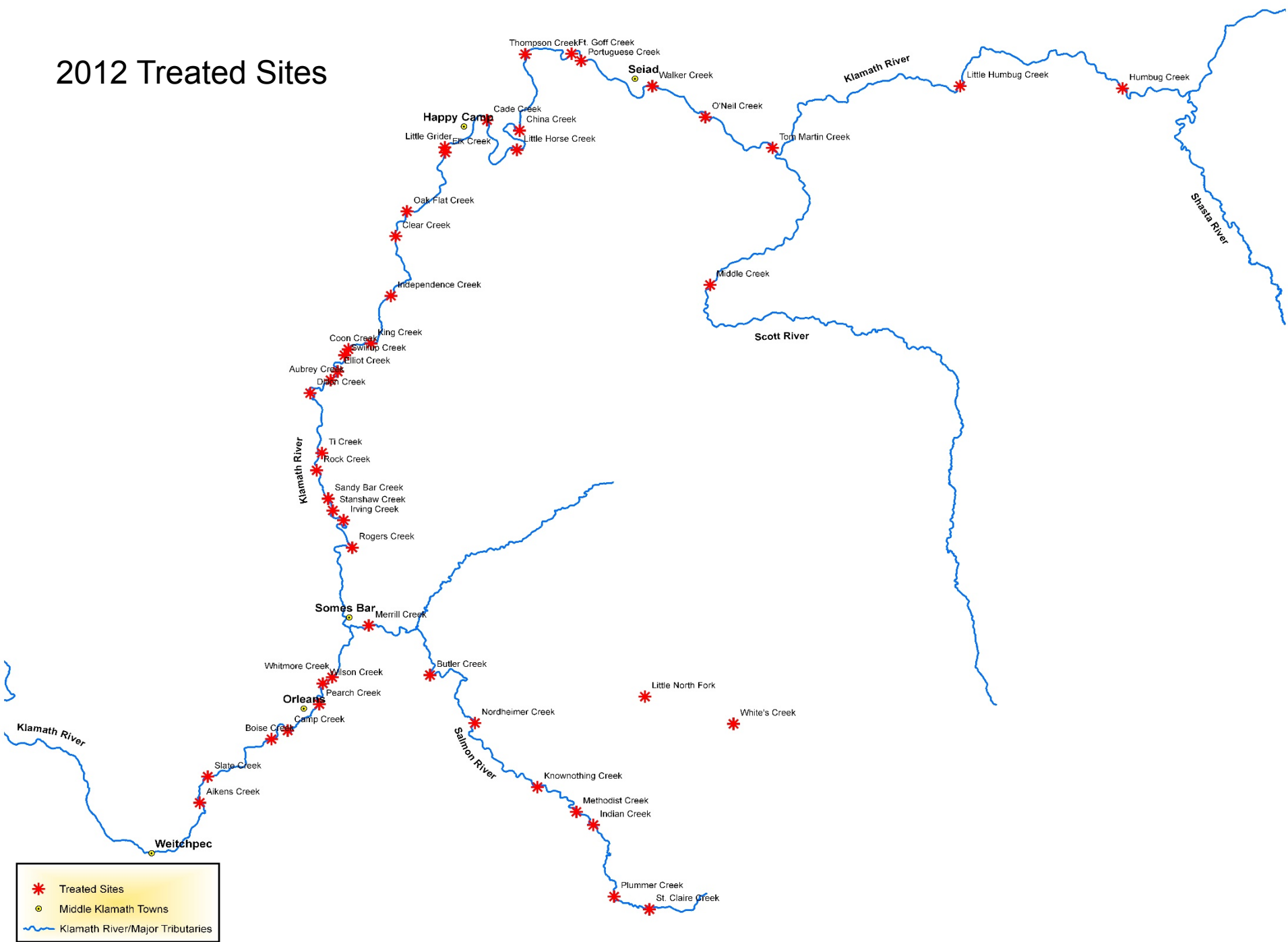
Monitoring Results Above Treated Barriers 2012



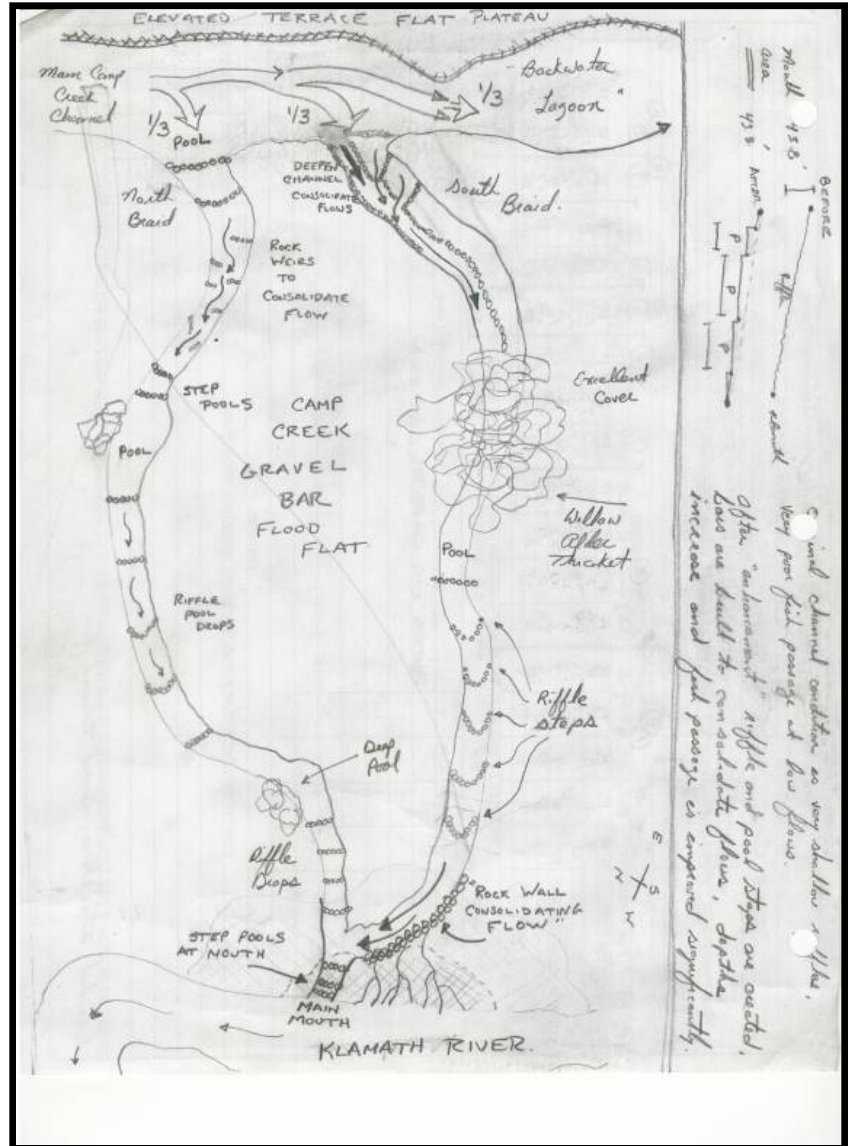
Pre- and Post-Treatment Coho Monitoring Results 2012

Tributary	Date Assessed	Coho Before	Date Monitored	Coho After
Grider Creek	6/28/2012	25	8/14/2012	267
West Grider Creek	6/1/2012	3	8/14/2012	324
Portuguese Creek	6/5/2012	0	8/1/2012	10
Fort Goff Creek	7/1/2012	51	8/1/2012	55
Thompson Creek	7/10/2012	200	8/1/2012	721
China Creek	6/20/2012	2	8/2/2012	43
Cade Creek	7/4/2012	28	8/2/2012	91
Oak Flat Creek	7/10/2012	3	8/2/2012	6
Teep Teep Creek	7/2/2012	0	8/9/2012	20
Camp Creek	7/12/2012	103	8/6/2012	115
Totals:		415		1652

2012 Treated Sites

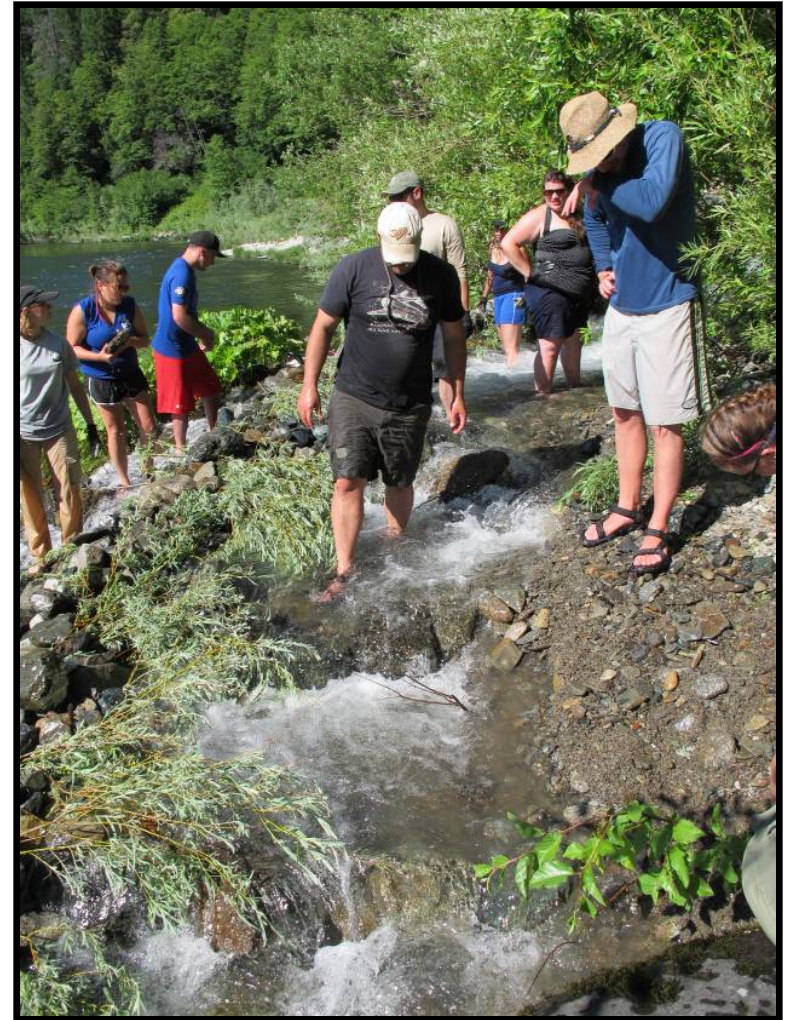


Camp Creek – Before and After



Rodgers Creek – Before and After

In 2010, MKWC and KTFP crews created a low gradient step and pool fishway, bypassing a 15 foot cascade at the mouth of Rogers Creek.(top). In June of 2012, the Americorps Watershed Stewards Project ,along with MKWC and KTFP staff, worked to maintain passage in this new channel during a weeklong training on the Klamath River (left). Six Chinook redds were counted above the barrier in the Fall of 2012.



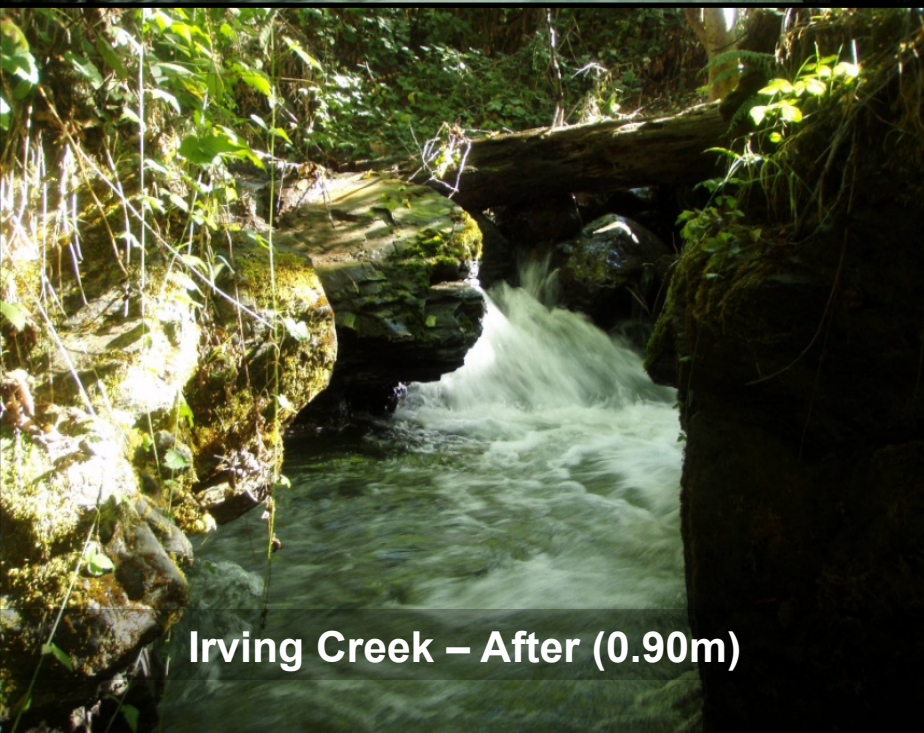
Coon Creek Fish Ladder – Before and After



- Coon Creek was noted as a productive steelhead stream prior to the Highway 96 construction and culvert installation.
- CDFW identified the culvert as a barrier as early as 1934, and in 1977 the fish ladder (left) was installed in lieu of a bridge replacement.
- MKWC regularly clears the ladder of debris, and when flows permit MKWC monitors for steelhead spawning above the culvert.



Irving Creek – Before (1.90m)

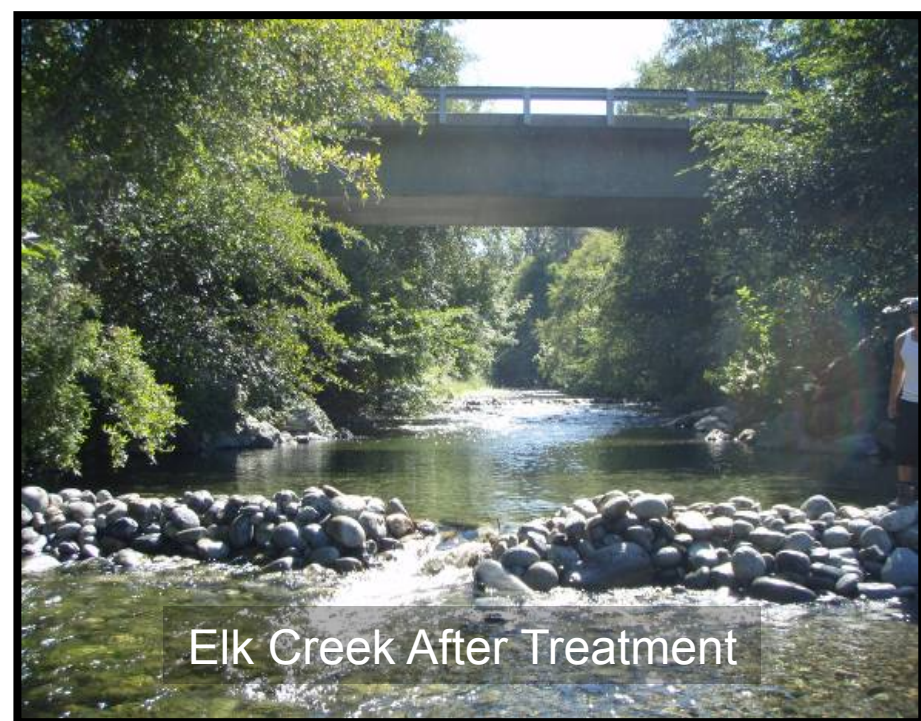
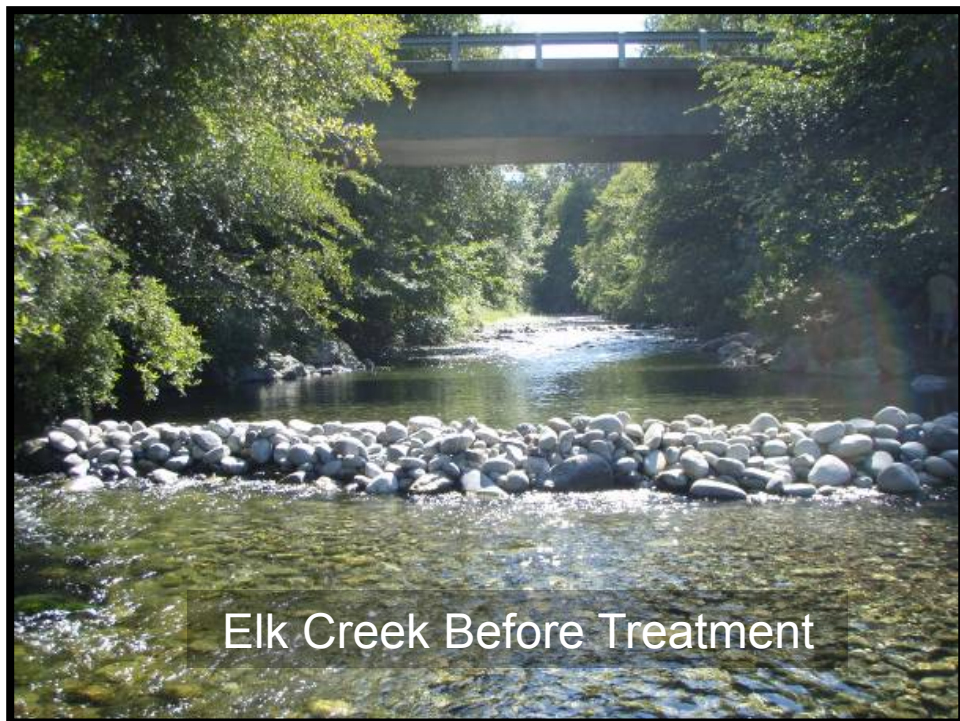


Irving Creek – After (0.90m)

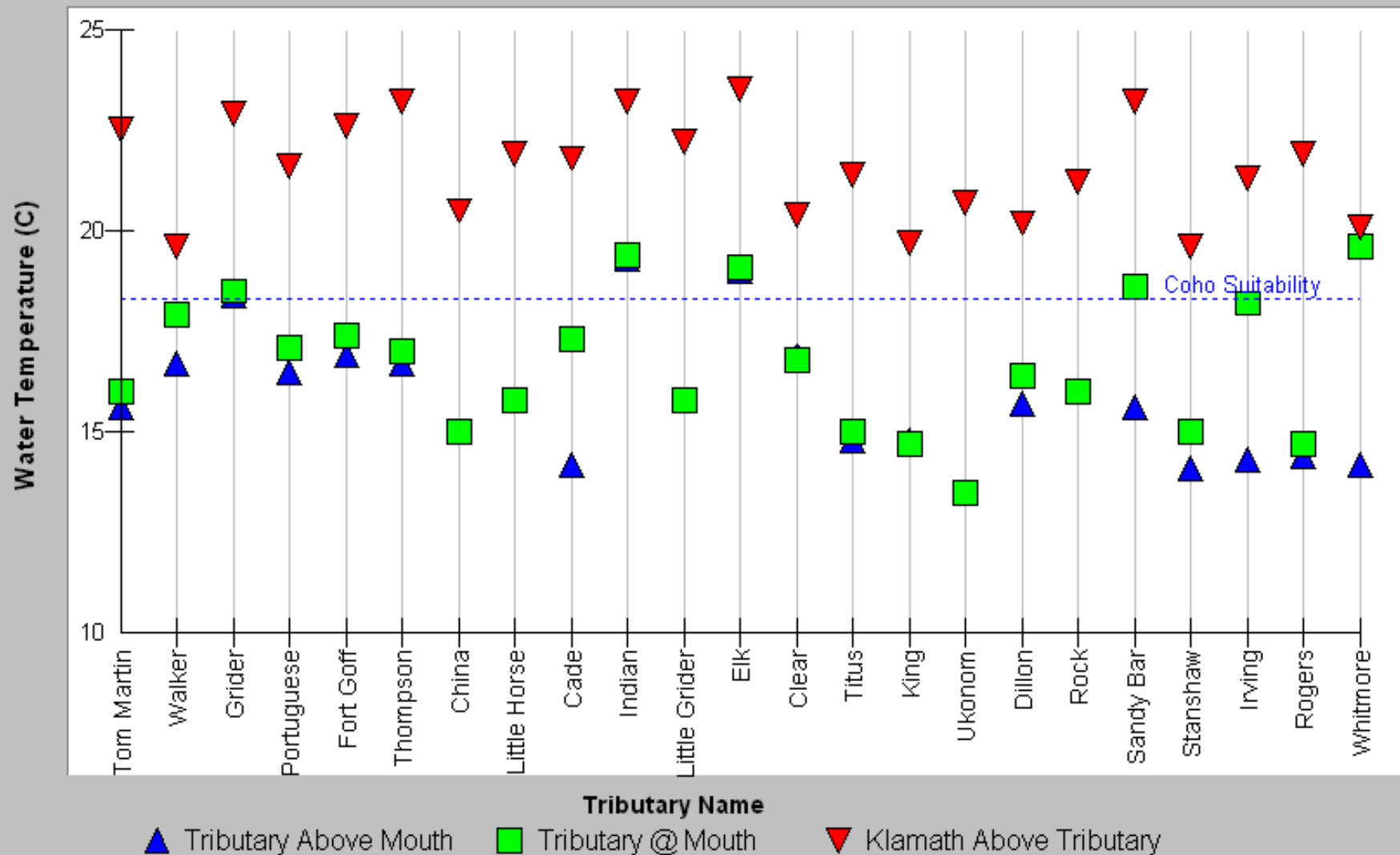
Boulder Cascade on Irving Creek

- Barrier formed in 2006 flood event
- 10 Fall Chinook redds documented upstream after treatment in 2007

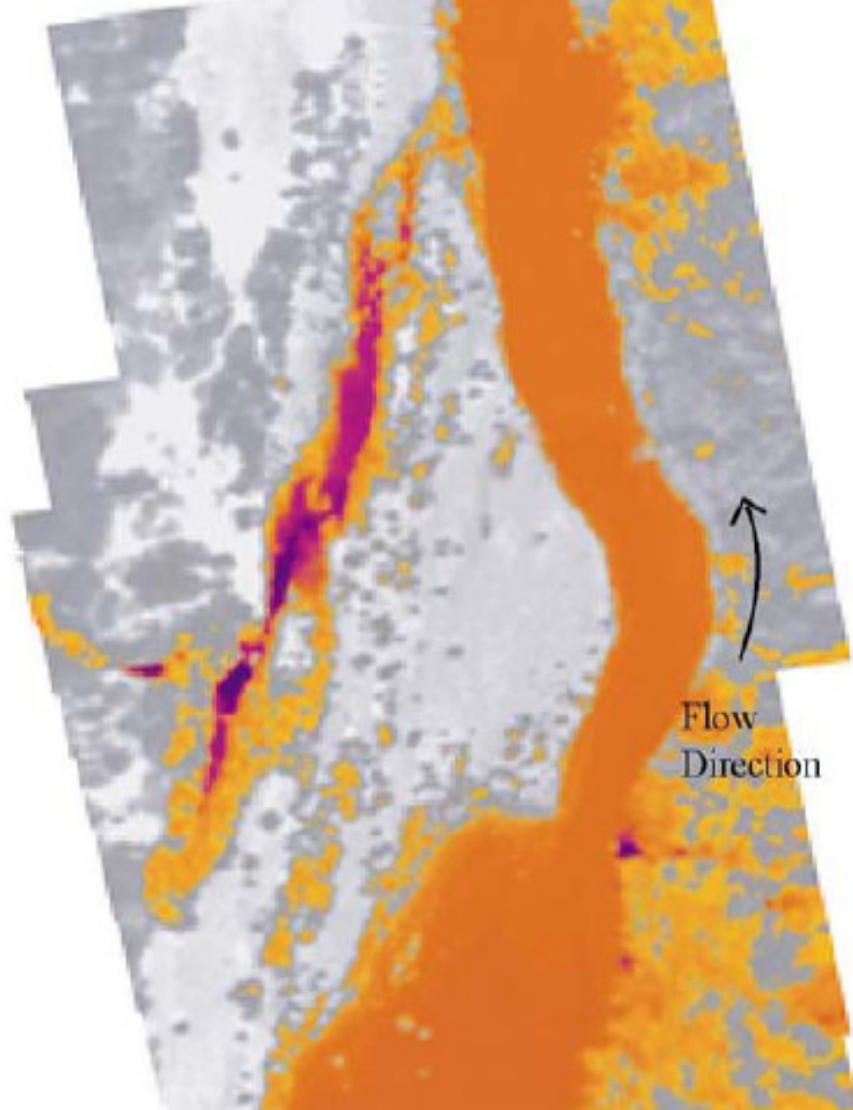
Swimmer's dams and dams constructed during wildfires for drafting cause recurring blockages to fish passage on several key anadromous tributaries, such as Walker Creek, Elk Creek, Indian Creek, Portuguese Creek, Fort Goff Creek, Seiad Creek, etc. By monitoring tribs throughout the summer, MKWC can address these barriers as they arise.



Middle Klamath Tributary and Mainstem Klamath River Temperatures 2006



As tributaries flow across the Klamath floodplain, they can warm up, causing fish to miss potential refugial habitat just upstream. By concentrating flow, we have been able to decrease creek temperatures at their confluence with the Klamath River by as much as 6°C.



Sandy Bar Creek is hotter than the Klamath at their confluence. By concentrating flows and making a step pool fishway over the alluvial bar, MKWC and partners have maintained access to over 1,500 feet of high quality juvenile coho rearing habitat in the lower reach of the creek.

TIR Image Temperature Scale (deg C)

frame:klamD1351-1356



2014 Data

- **54 streams assessed for barriers.**
- **40 Barriers treated in 32 streams. 54 streams assessed for barriers.**

2014 Monitoring Results:

- Tom Martin from mouth to culvert there were 27 coho on 5/8/2014. On 7/8/2014 there were 920 coho in same reach.
- ONeil Creek on floodplain terrace, there were 0 coho on 5/13/2014. On 7/8/2014 there were 185 coho on this floodplain terrace.
- Independence Creek in the first major pool, there were 8 coho on 7/10/14. On 8/27/14 there were 103 coho in this pool.