Trabuco Ranger District Dam Removal and Aquatic Organism Passage Monitoring

Trabuco Ranger District

Cleveland National Forest

Regulatory Meas. ID: 397696

Place ID: 808455

2017 Annual Report

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Project Description

Title: Trabuco Ranger District Dam Removal and Aquatic Organism Passage Monitoring

Purpose: The purpose of this report is to outline the ongoing monitoring of stream restoration as part of the Fish Dam Removal Project and to ensure that project goals have been met.

Goals:

- Treated sites no longer form aquatic organism barriers
- Treated sites are recovering and leading to improved habitat conditions
- There are no negative long –term effects of the dam and aquatic organism barrier removal
- Water quality and downstream beneficial uses are protected during construction/decommissioning.

Projected End Date: Ongoing

Schedule: Attachment A

Introduction

The purpose of this report is to document the results of the ongoing monitoring of stream restoration as part of the Fish Dam Removal Project and to ensure that project goals have been met. The information in this report will be used to direct adaptive management and continued monitoring efforts.

The purpose of the Trabuco District Dam Removal Project is to enhance aquatic organism passage and stream habitat in Silverado, Holy Jim, Trabuco and Upper San Juan creeks. Removing manmade dams in these creeks is essential to supporting native aquatic species and providing suitable habitat for potential re-establishment of extirpated species including southern steelhead trout. This project will also eliminate public safety hazards created by these dams and restore natural stream processes.

In 2014, a total of 9 dams were removed in Trabuco Creek and Holy Jim Creek using an excavator to break up and re-distribute dam materials as well as pneumatic or gas-powered drills, jackhammers, and non-toxic expanding mortars. Materials were re-distributed along the stream and in some cases used as bank protection.
The dams removed in Trabuco Creek in 2014 were TCFD7, TCFD9, TCFD10, and TCFD11.
The dams removed in Holy Jim Creek in 2014 were HJFD6, HJFD7, HJFD8, HJFD9, and HJFD10.

In 2017, a total of 9 dams were removed in Silverado and Holy Jim Creeks using explosives to break up and redistribute dam materials.
The dams removed in Silverado Creek in 2017 were SCFD7, SCFD8, SCFD10, and SCFD12.
The dams removed in Holy Jim Creek in 2017 were HJFD15, HJFD16, HJFD17, HJFD18, and HJFD19.

Monitoring Goals

The goal of monitoring is to collect data to ensure that treated sites will no longer form aquatic organism barriers; treated sites are recovering and trending toward improved habitat conditions; no negative long-term effects will result from dam and aquatic organism barriers; and water quality and downstream beneficial uses are protected during construction and decommissioning.

Methods

Site selection

At each phase of the project, a stream reach will be identified and documented. At these stream reaches Proper Functioning Condition will be determined as described in Riparian Area Management TR 1737-15 1998, *A User Guide to Assessing Proper Functioning Condition and the Supported Science of Lotic Areas.*

All treatment sites will have photo documentation of pre and post implementation. Photo points will be established prior to project implementation and each treatment site will be permanently marked to facilitate in identification. Sites will be photographed annually for three years following treatment.

In-depth Monitoring

At a minimum, 10 percent of the sites treated in each phase will be randomly selected for in-depth monitoring. Sites that are planned for stored sediment removal will automatically be included in the in-depth monitoring. Randomly selected sites will be monitored for percent pool tail fines, cobble embeddedness, jump height, percent bare soil, streambank stability, and riparian vegetation.

Percent tail fines sampling at each site will include three samples, one pool upstream of treatment, and one at each of the first two pools directly downstream of the treatment. The upstream sample is used for a control. Sampling methods used for determining percent pool tail fines is taken from the Stream Condition Inventory (SCI) Manual used by the Forest Service to assess habitat and stream conditions. A successful rating is measured by a stable or decreasing trend in fines by year three.

Cobble embeddedness at each site will include a random walk across the reach and evaluation of 25 cobbles for percent embeddedness. Methods for evaluation of cobble embeddedness are taken from the SWAMP Bioassessment Procedure, 2007. A successful rating is measured by a stable or decreasing trend in embeddedness by year three.

Monitoring will look at aquatic organism passage at the treatment site. If jump height is less than one foot, this parameter at the site will be rated as successful.

Percent bare soil monitoring due to project implementation will be conducted using transects across the treatment area. Soil cover will include organic matter, vegetation, rock greater than 1cm, and woody

debris. Percent cover has a target of 75% or greater and should mimic cover in adjacent undisturbed areas.

Streambank stability will be determined as described in the SCI Manual with some alterations. Three transects will be used at each site for monitoring. A successful rating is measured by an increasing trend in bank stability by year three and no sites rated as unstable as determined by the SCI manual.

Monitoring of riparian vegetation re-establishment will be conducted through analysis of photo point data. An increasing trend in riparian vegetation at the disturbed sites would be rated as successful.

Duration

Monitoring will occur annually following the winter and early spring season, occurring preferably within the late spring/early summer. Annual monitoring will continue for 3 years following the site treatment. Pre-project data will be collected prior to implementation.

Additional Monitoring

The Forest Service is required to use Best Management Practices (BMP) as part of the project design and implementation. BMPs have been certified by the State Water Quality Resources Control Board and approved by the Environmental Protection Agency as the most effective way to protect water quality from impacts stemming from nonpoint sources of pollution. The Best Management Practices Evaluation Program (BMPEP) is a monitoring program that randomly selects projects and sites across the Forest annually. A final report is sent to the Regional Water Quality Control Board to ensure compliance with the Clean Water Act. Monitoring will evaluate activities during and once a year after construction. BMPEPs will be considered passing with at least 90% of sites rated as implemented and effective.

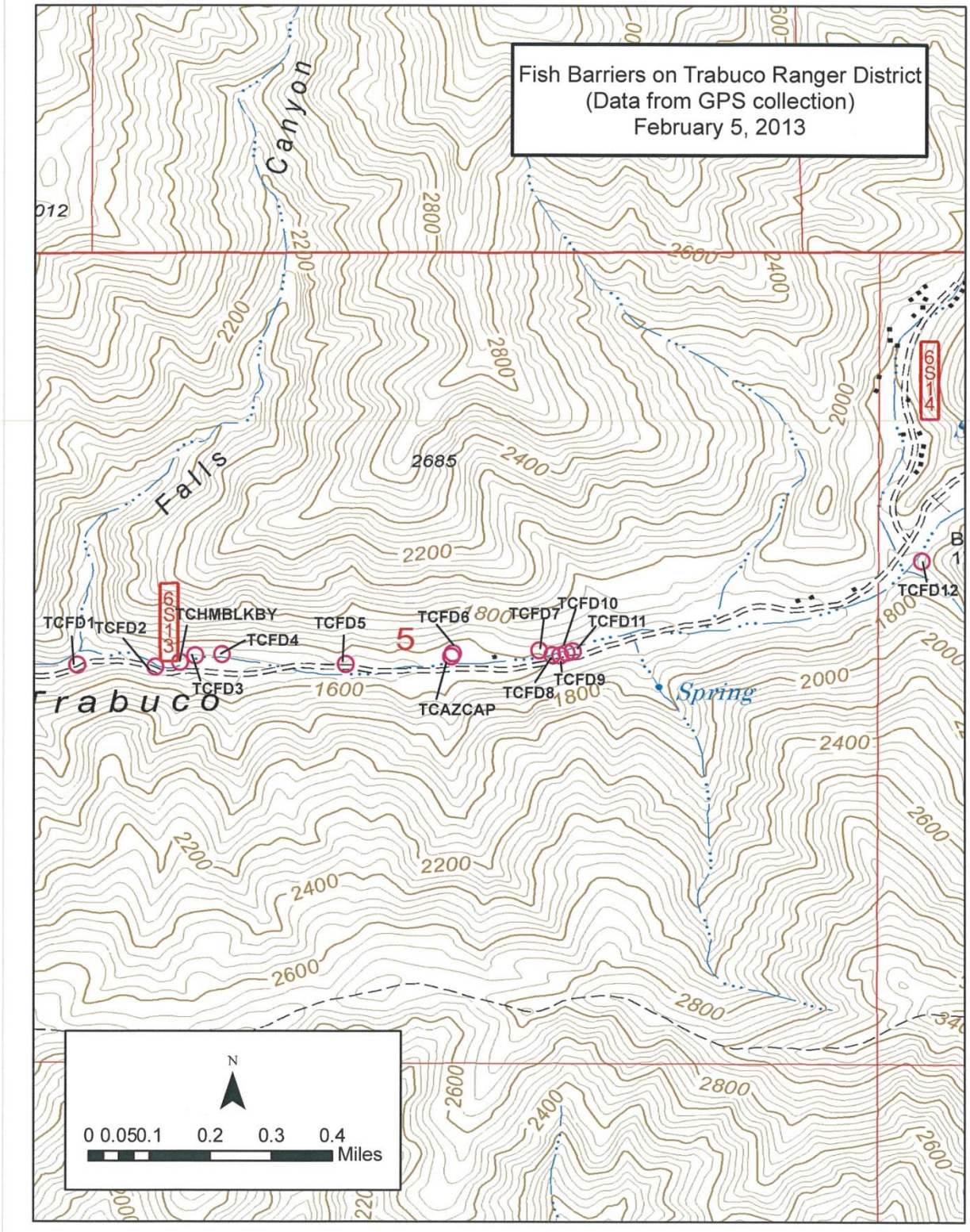
Summary of Findings

Properly Functioning Condition

A Properly Functioning Condition (PFC) survey was done on reaches encompassing all dams implemented in 2014 in Trabuco Creek and in Holy Jim Creek and all dams implemented in 2017 in Holy Jim and Silverado Creeks.

Trabuco Creek

The reach selected in Trabuco Creek began just downstream of TCFD7 (UTM 11S 451247mE, 3726147mN) and ended just upstream of TCFD11 (11S 451326mE, 3726175mN). Our pre-implementation PFC assessment of Trabuco Creek occurred February 2013. Post-implementation PFC assessments occurred October 26, 2015 for year one, August 17, 2016 for year two, and August 8, 2017 for the final year of PFC monitoring.


Fish Barriers on Trabuco Ranger District
(Data from GPS collection)
February 5, 2013
Canyon
Falls
Trabuco
Spring
2685
6S13
6S14
TCHMBLKBY
TCFD1
TCFD2
TCFD3
TCFD4
TCFD5
TCFD6
TCFD7
TCFD8
TCFD9
TCFD10
TCFD11
TCFD12
TCAZCAP
5
N
0 0.050.1 0.2 0.3 0.4
Miles

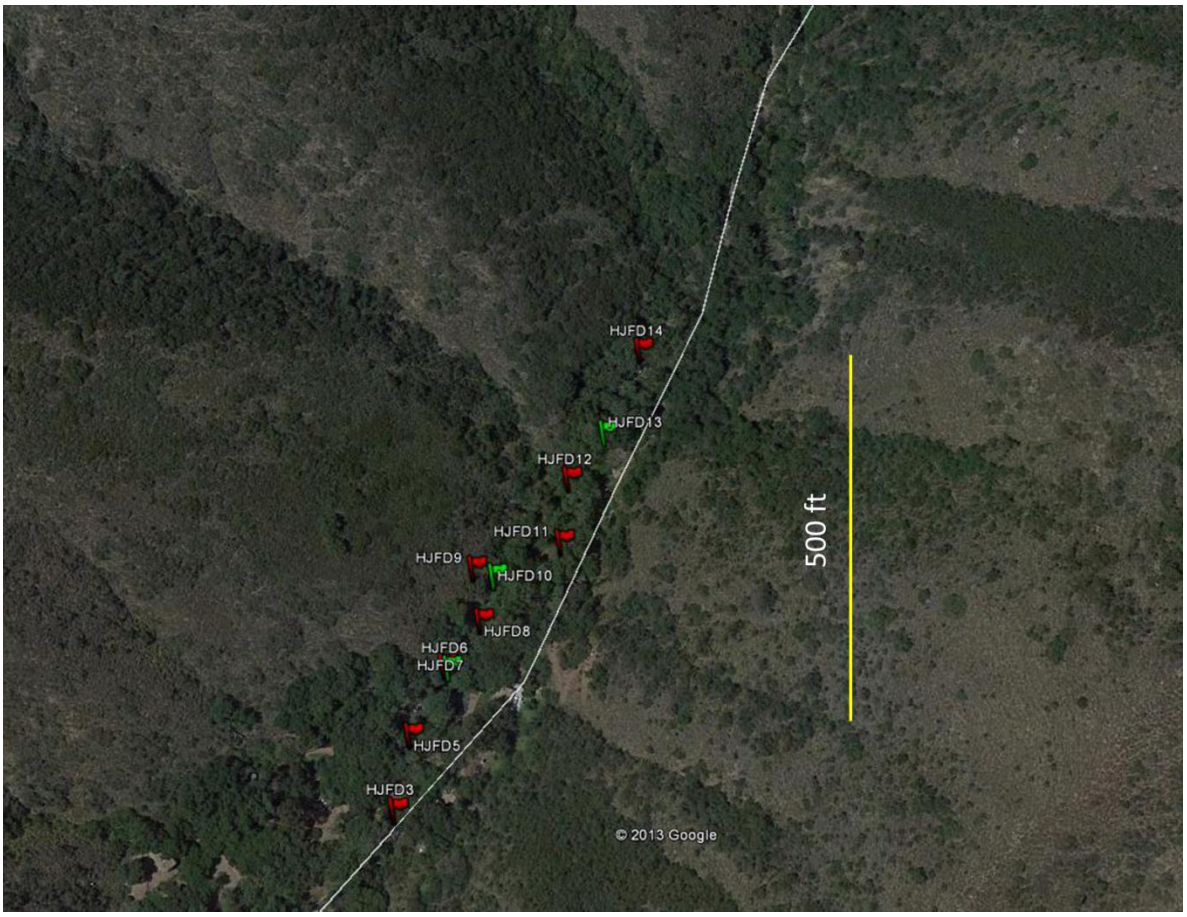
This reach obtained a Functional Rating of Functional- At Risk pre- implementation due to the system not being vertically stable as well as the stream not being in balance with the water and sediment supplied by the watershed. The vertical instability has been caused by scouring out of large plunge pools below the dams and sediment accumulation above the dams, resulting in large gradient changes in the channel.

This reach obtained a Functional Rating of Functional post-implementation for years one, two, and three. The removal of the dams has allowed for the system to become more vertically stable by allowing plunge pools to be filled with the material the dams were holding back creating a more natural gradient.

Dam removal and winter flows have allowed the channel to begin returning to a more natural bedload and sediment transport regime. The channel is moving towards a more natural gradient as sediment that was artificially stored behind the dams has been mobilized and redeposited in scoured out plunge pools that had formed below the dams. Since the rains of winter 2016-2017, the channel is now down to boulders and bedrock in the area where the dam previously stored sand and sediment.

Holy Jim Creek

The reach selected in Holy Jim Creek began just downstream of HJFD6 (UTM 11S 452201mE, 3727162mN) and ended just upstream of HJFD10 (11S 452222mE, 3727205mN). Our pre-implementation PFC assessment of Holy Jim Creek occurred February 2013. Post-implementation PFC assessments occurred October 26, 2015 for year one, August 17, 2016 for year two, and August 8, 2017 for the final year of PFC monitoring.



This reach obtained a Functional Rating of Functional- At Risk both pre- implementation and post implementation due to the presence of non-native plants preventing a diverse composition and age classes of riparian-wetland vegetation as well as the system not being vertically stable and the stream not being in balance with the water and sediment supplied by the watershed. Many of the characteristics that contribute to the Functional - At Risk rating are outside the scope of the project. Similar to Trabuco Creek, scouring occurred below the dams resulting in large plunge pools and sediment accumulation behind the dams resulting in large gradient changes in the channel. However, unlike Trabuco Canyon, to date the gradient has not been restored and sediment in the channel has not been mobilized to the point of filling in the plunge pools. The large variations in gradient still exist. There is no apparent trend in Holy Jim Creek at this point.

Best Management Practices Evaluation Program Monitoring

Best Management Practices Evaluation Program monitoring evaluates implementation activities for adherence to water quality protection measures. Form E13: In-Channel Construction Practices was used

to evaluate adherence to BMPs 2.14: Controlling in-channel excavation. No turbidity was observed greater than 20 channel widths downstream in either Trabuco or Holy Jim Creeks during construction/dam demolition. Material from the dam was used as planned, to stabilize disturbed banks. The evaluation results were rated as *implemented* and *effective*.

There were no instances of noncompliance during project implementation.

Photo Documentation

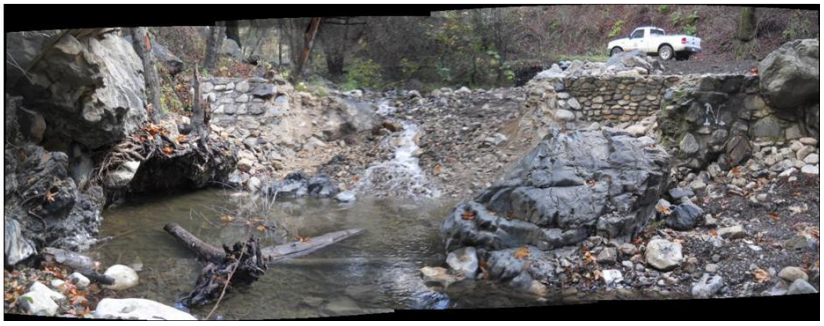
All treatment sites have photo documentation of pre and post implementation. Photo points have been established prior to project implementation. Photo points will continue to be collected annually for 3 years post implementation.

Trabuco Creek Sites

Site TCFD7 (UTM 11S 451247mE, 3726147mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
6	5.5 base 2.5 top	31	6

Downstream of dam Feb 2013



Downstream of dam after demo 19 Dec 2014

Downstream of dam – Aug 2016

Downstream of dam – May 2017

Site TCFD9 (UTM 11S 451294mE, 3726173mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
4.5 Edges 9 Thalweg	2.5	25	6

Downstream of dam Feb 2013

Downstream of dam after demo 19 Dec 2014

Downstream of dam after demo Aug 2016

Site TCFD10 (UTM 11S 451312mE, 3726171mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
2.5	2.5	Across channel between large rock boulders creating permanent plunge pool and retaining sediment upstream	N/A

Downstream of dam Feb 2013

Downstream of dam after demo 19 Dec 2014

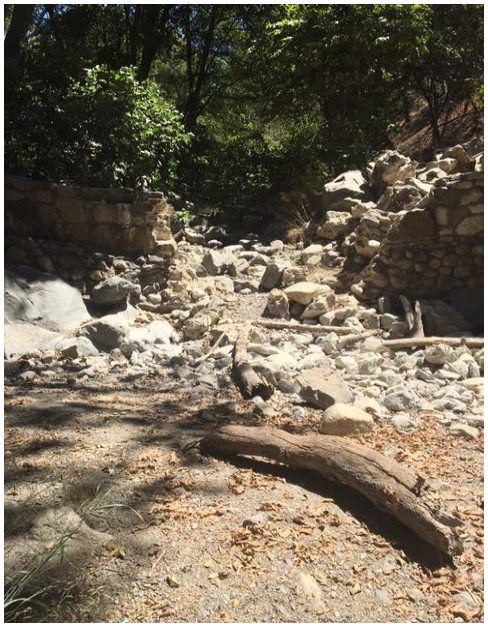
Downstream of dam after demo Aug 2016

Site TCFD11 (UTM 11S 451326mE, 3726175mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
6.5	2.0	40	5.5

Downstream of dam Feb 2013

Downstream of dam after demo 19 Dec 2014



Downstream of dam - Aug 2016

Downstream of dam – May 2017

Holy Jim Creek Sites

Site HJFD6 (UTM 11S 452201mE, 3727162mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
2.3	3	12	N/A

Downstream Feb 2014

Downstream during demo 19 Dec 2014

Downstream of dam after demo Aug 2016

Site HJFD7 (UTM 11S 452199mE, 3727164mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
2.5	3	21	N/A

Downstream Feb 2014

Downstream after demo 19 Dec 2014

Upstream of dam after demo Aug 2016

Site HJFD8 (UTM 11S 452215mE, 3727183mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
5	2.5	N/A	N/A

Downstream Feb 2014

Downstream after demo 19 Dec 2014

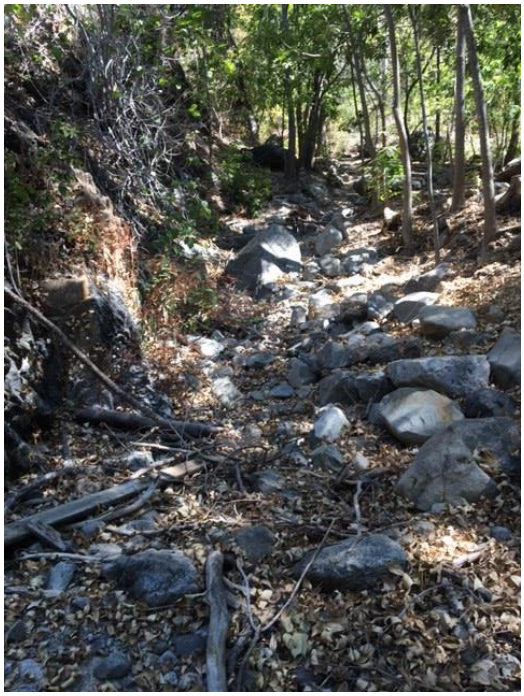
Downstream after demo Aug 2016

Site HJFD9 (UTM 11S 452212mE, 3727208mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
2.3	3.6	14	N/A

Downstream before demo Feb 2014

Downstream after demo 19 Dec 2014



Downstream after demo Aug 2016

Site HJFD10 (UTM 11S 452222mE, 3727205mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
1.5	1.8	16	N/A

South Bank Feb 2014

South Bank after demo 19 Dec 2014

South Bank/Down Stream after demo Aug 2016

Site HJFD15 (UTM 452495mE, 3727688mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
9.3	2.0	30	N/A

Looking U/S before demo March 2017.

Looking U/S post demo August 2017

Looking upstream, May 2017

Site HJFD16 (452558mE, 3727766mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
2.0	2.5	16	N/A

Looking U/S before demo March 2017

Looking U/S directly after demo March 2017

Looking upstream, May 2017 (shows dams 16 and 17)

Site HJFD17 (UTM 452560mE, 3727774mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
4	3	18	N/A

Looking U/S before demo March 2017

Looking U/S directly after demo March 2017

Site HJFD18 (UTM 452568mE, 3727790mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
3.5	2.5	22	N/A

Looking U/S before demo March 2017

Looking U/S directly after demo March 2017

Looking upstream – dam 18 – May 2017

Site HJFD19 (UTM 452572mE, 3727808mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
2.5	2	16	N/A

Looking upstream before demo March 2017

looking upstream after demo May 2017

Site SCFD7 (UTM 447105mE, 3734737mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
6.5	8	45	N/A

Looking U/S before demo March 2017

Looking U/S directly after demo March 2017

Looking upstream after demo Sept 2017

Site SCFD8 (UTM 447115mE, 3734767mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
6.5	8	40	N/A

Looking U/S before demo March 2017

Looking U/S directly after demo March 2017

Looking upstream after demo – Sept 2017

Site SCFD10 (UTM 447163mE, 3734795mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
7.5	2.5	53	N/A

Looking U/S before demo March 2017

Looking U/S directly after demo March 2017

Looking upstream after demo Sept 2017

Site SCFD12 (UTM 447386mE, 3734829mN)

Structure Height (ft)	Structure Thickness (ft)	Overall Structure Length (ft)	Spillway Opening Width (ft)
4	3	25	N/A

Looking U/S before demo March 2017

Looking U/S directly after demo March 2017

Looking upstream after demo Sept 2017

In-depth Monitoring

Sites for in depth monitoring were randomly selected in all creeks with dams removed. The sites selected are TCFD11 (UTM 11S 451326mE, 3726175mN), HJFD6 (UTM 11S 452201mE, 3727162mN), HJFD15 (UTM 11S 452495mE, 3727688mN), and SCFD7 (UTM 11S 447105mE, 3734737mN).

Percent Pool Tail Fines

Surface fines describe the percentage of streambed area with exposed fine sediments. Percent pool tail fines sampling at each site included three samples, one pool upstream of treatment, and one at each of the first two pools directly downstream of the treatment. Sampling methods used for determining percent pool tail fines using a fines grid is taken from the Stream Condition Inventory Manual used by the Forest Service to assess habitat and stream conditions. A successful rating of pool tail fines is measured by a stable or decreasing trend in fines by year three.

Upstream measurements were taken for a control measurement. In Trabuco Creek, post-implementation percent pool tail fines measured downstream of the dam was 4.6% in year one, 3.7% in year two, and 0.33% in year three, compared to the upstream percent pool tail fines measurement of 3.3% in year one, 2.7% in year two, and 5.3% in year 3. In Holy Jim Creek (dams 6 through 10), post-implementation percent pool tail fines measured downstream of the dam was 3.7% in year one, 3.4% in year two, and 0% in year 3, compared to the upstream percent pool tail fines measurement of 8.7% in year one, 6.7% in year two, and 2% in year 3. A trend in decreasing fine sediments has been observed post implementation. Monitoring for the Trabuco Creek dam removal and for dams 6-10 at Holy Jim Creek is now complete.

In Silverado Creek, post-implementation percent pool tail fines measured downstream of the dam was 3.65% in year one, compared to the upstream percent pool tail fines measurement of 12% in year one. In Holy Jim Creek (dams 15 through 19), post-implementation percent pool tail fines measured downstream of the dam was 4.6% in year one, compared to the upstream percent pool tail fines measurement of 5.3% in year one. A trend in decreasing fine sediments is expected to occur post implementation. Monitoring for the Silverado Creek dam removal and for Holy Jim dams 15-19 will continue for three years.

Cobble Embeddedness

Cobble embeddedness is a way of measuring the suitability of stream substrates for aquatic organism habitat. Embedded substrates lack the interstitial spaces that create cover for invertebrates and juvenile fish as well as allowing flow between gravels. Embeddedness measures the degree at which cobbles are buried due to fine sediment deposition.

Cobble embeddedness at each site included a random walk across the site and evaluation of 25 cobbles for percent embeddedness. Methods for evaluation of cobble embeddedness are taken from the SWAMP Bioassessment Procedure, 2007. A successful rating of cobble embeddedness is measured by a stable or decreasing trend in cobble embeddedness by year three.

Cobble embeddedness of 21% was the result from the post-implementation survey for Trabuco Creek in year one, 19.4 % cobble embeddedness in year two, and 19.8% cobble embeddedness in year three. Cobble embeddedness for Holy Jim Creek at the selected site locations for dams 6-10 was 24.4% in year one post implementation, 13.8% in year two, and 16.4% in year three. A trend in decreasing embeddedness has been observed post implementation. Annual collection of cobble embeddedness data is complete for the Holy Jim dams 6-10.

Cobble embeddedness of 21.6% was the result from the post-implementation survey for Holy Jim Creek dam 15 in year one. Cobble embeddedness was 7% for Silverado dam 7 in year one. A trend in decreasing embeddedness is expected to occur post implementation. Annual collection of cobble embeddedness data for Silverado dams and Holy Jim dams 15-19 will continue for three years.

Jump Height

Jump height was measured for aquatic organism passage at all sites in Trabuco Creek, Holy Jim Creek, and Silverado Creek pre and post- implementation. If jump height is less than one foot post-implementation, this parameter will be rated as successful.

Prior to removal, TCFD11 had a jump height of 1.5ft. After removal of the dam the jump height has been reduced to 0ft.

Prior to removal, HJFD6 had a jump height of 0ft and remains at 0ft after the removal of the dam. HJFD6 was not a barrier to aquatic organism passage prior to removal but locally constrained the channel. Removal will benefit the stream if conducted in conjunction with the removal of other dams in the area.

Prior to removal, HJFD 15 had a jump height of 4.2 feet. After removal of the dam the jump height has been reduced to 0 feet.

Prior to removal Silverado dam 7 had a jump height of 7 feet. After removal, the jump height has been reduced to 0 feet.

Percent Bare Soil

Percent bare soil monitoring due to project implementation was conducted using transects across the treatment areas prior to project implementation and after implementation. Percent cover has a target of 75% or greater and should mimic cover in adjacent undisturbed areas.

Both Trabuco Creek and Holy Jim Creek at dams 6-10 have very small amounts of bare soil. Both of these channels are composed of bedrock, boulders, and gravel. The small amounts of bare soil seem to be caused from human foot traffic near the dam sites. Each site had 0-3% bare soil both before and after project implementation.

Both Silverado Creek and Holy Jim Creek at dams 15-19 have very small amounts of bare soil. Both of these channels are composed of bedrock, boulders, and gravel. The small amounts of bare soil seem to be caused from human foot traffic near the dam sites. Holy Jim dam 15 had 0-3% bare soil both before and after project implementation. Silverado dam 7 had 0-3% bare soil before project implementation, and 15% bare soil after implementation.

Streambank Stability

Streambank stability was determined as described in the Stream Condition Inventory Manual with some alterations prior to project implementation and after implementation at Trabuco Creek, Holy Jim Creek, and Silverado Creek. A successful rating is measured by an increasing trend in bank stability by year three and no sites rated as unstable as determined by the SCI manual.

Streambank stability ratings were determined for TCFD11 and HJFD6 prior to implementation and after implementation with no changes observed.

HJFD6:
Right bank upstream: stable (bedrock)
Left bank downstream: stable (bedrock)
Right bank downstream: stable (vegetation and boulders)

TCFD11:
Right bank upstream: stable (with vegetation)

Right bank downstream: stable (bedrock)
Left bank downstream: stable (with large boulders)

Streambank stability for HJFD15 and SCFD7 were determined prior to implementation and after implementation with no changes observed.

HJFD15:
Right bank upstream: stable (vegetation and boulders)
Left bank downstream: stable (bedrock)
Right bank downstream: stable (vegetation and boulders)

SCFD7:
Right bank upstream: vulnerable (with vegetation)
Right bank downstream: vulnerable (with vegetation)
Left bank downstream: stable (bedrock)

Riparian Vegetation

Monitoring of riparian vegetation re-establishment is conducted through analysis of photo point data. An increasing trend in riparian vegetation at the disturbed sites will be rated as successful.

Photos were taken pre-implementation and post-implementation at all in-depth monitoring sites. There has been no visible change in riparian vegetation within the one year after dam removal at the Trabuco Creek and Holy Jim dams 6-10 sites. Sites will continue to be photographed annually for three years following treatment. At Silverado Creek and Holy Jim dams 15-19, blasting removed leaves from much of the vegetation so there were immediate effects on the vegetative cover. As of September 2017, six months post implementation, vegetation has recovered to pre-implementation levels.

Overall summary of findings

Monitoring Site	Parameter		Results			
			Pre-implementation	Post-implementation (Yr 1)	Post-implementation (Yr 2)	Post-implementation (Yr 3)
Trabuco TCFD7-TCFD11						
	PFC	Functional-At Risk		Functional	Functional	Functional
	BMP-EP	N/A		Rated Implemented and Effective	Rated Implemented and Effective	Rated Implemented and Effective
TCFD11						
	Photo Doc.	Completed		Completed	Completed	Completed
	% Pool Tail Fines	N/A		Upstream: 3.3%; Downstream: 4.6%	Upstream: 2.7%; Downstream: 3.7%	Upstream: 5.3%; Downstream: 0.33%
	Cobble Emb.	N/A		21%	19.40%	19.80%
	Jump Height	1.5ft		0ft	0ft	0ft
	% Bare Soil	0-3%		0-3%	0-3%	0-3%
	Stream Bank Stab.	Stable		Stable	Stable	Stable
	Riparian Veg.	Completed		Completed-no change	Completed-no change	Completed-Increase in veg. cover
Holy Jim HJFD06-HJFD10						
	PFC	Functional-At Risk		Functional- At Risk		

	BMP-EP	N/A		Rated Implemented and Effective	Rated Implemented and Effective
HJFD6					
	Photo Doc.	Completed	Completed	Completed	Completed
	% Pool Tail Fines	N/A	Upstream: 8.7% ; Downstream: 3.7%	Upstream: 6.7%; Downstream: 3.4%	Upstream: 2%; Downstream: 0%
	Cobble Emb.	N/A	24%	13.80%	16.40%
	Jump Height	0ft	0ft	0ft	0ft
	% Bare Soil	0-3%	0-3%	0-3%	0-3%
	Stream Bank Stab.	Stable	Stable	Stable	Stable
	Riparian Veg.	Completed	Completed-no change	Completed-no change	Completed-Increase in veg. cover
Holy Jim HJFD15-HJFD19					
	PFC	Functional-At Risk	Functional-At Risk		
	BMP-EP	N/A	Rated Implemented and Effective		
HJFD15					
	Photo Doc.	Completed	Completed		
	% Pool Tail Fines	Upstream:0%; Downstream:0%	Upstream: 5.3%; Downstream:4.6 %		
	Cobble Emb.	20.60%	21.60%		
	Jump Height	4.2ft	0ft		

	% Bare Soil	0-3%	0-3%		
	Stream Bank Stab.	Stable	Stable		
	Riparian Veg.	Completed	Completed		
Silverado SCFD7-SCFD12					
	PFC	Functional-At Risk	Functional-At Risk		
	BMP-EP	N/A	Rated Implemented and Effective		
SCFD7					
	Photo Doc.	Completed	Completed		
	% Pool Tail Fines	Upstream:0%; Downstream:0%	Upstream: 12%; Downstream:3.65 %		
	Cobble Emb.	14.40%	7.00%		
	Jump Height	7.0ft	0ft		
	% Bare Soil	0-3%	15%		
	Stream Bank Stab.	Vulnerable	Vulnerable		
	Riparian Veg.	Completed	Completed		

REFERENCES

California Water Board, Surface Water Ambient Monitoring Program (SWAMP), 2007. *SWAMP Bioassessment Procedures 2007, Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California*. February 2007. www.waterboards.ca.gov/swamp

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Attachment A: Schedule of Treatment

SUMMARY DAM REMOVAL SCHEDULE									
	Location				Number of Dams			Implementation	
	Trabuco Ck	Holy Jim Ck	Silverado Ck	San Juan Ck	Total	Removed	Year	Delays	Instances of Noncompliance
total dams	**4**	**38**	**6**	**30**	**78**				
Phase 1	4	5	0	0		9	Completed 2014	None	None
Phase 2		5	4			9	March 2017	None	None
Phase 3		12	2	11		25	Planned 2018	-	-
Phase 4		16		19		35	Planned 2019	-	-

DETAILED SCHEDULE OF ACTIVITIES

Site #	Phase	Year Planned	Year Implemented	Monitoring Year 1	Monitoring Year 2	Monitoring Year 3	Photo Point	In-Depth Monitoring
TCFD7	1	2014	2014	2015	2016	2017	Yes	No
TCFD9	1	2014	2014	2015	2016	2017	Yes	No
TCFD10	1	2014	2014	2015	2016	2017	Yes	No
TCFD11	1	2014	2014	2015	2016	2017	Yes	Yes
HJFD6	1	2014	2014	2015	2016	2017	Yes	Yes
HJFD7	1	2014	2014	2015	2016	2017	Yes	No
HJFD8	1	2014	2014	2015	2016	2017	Yes	No
HJFD9	1	2014	2014	2015	2016	2017	Yes	No
HJFD10	1	2014	2014	2015	2016	2017	Yes	No
SCFD 7-12	2	2017	2017	2017	2018	2020	Yes	SCFD7 only
HJFD 15-19	2	2017	2017	2017	2018	2019	Yes	HJFD15 only
SCFD 4,5	3	2018		2018	2019	2020	Yes	No
HJFD 1-5, 11-14, 21-30	3	2018	-	2018	2019	2020	Yes	tbd
SJFD 28-31	3	2018		2018	2019	2020	Yes	tbd
SJFD8	3 or 4	2019	-	2019	2020	2021	Yes	No
SJFD14	3 or 4	2019	-	2019	2020	2021	Yes	No
SJFD18	3 or 4	2019	-	2019	2020	2021	Yes	No
SJFD20	3 or 4	2019	-	2019	2020	2021	Yes	No

SJFD21	3 or 4	2019	-	2019	2020	2021	Yes	Yes
SJFD22	3 or 4	2019	-	2019	2020	2021	Yes	No
SJFD24	3 or 4	2019	-	2019	2020	2021	Yes	No
SJFD25	3 or 4	2019	-	2019	2020	2021	Yes	No
SJFD27	3 or 4	2019	-	2019	2020	2021	Yes	No