

Lower Klamath Sub-Basin Coordination & Planning - FYs 2012-2013

Annual & Final Progress Report: 10/01/13 – 09/30/14



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Agreement Numbers:
F12AP00477 – FY 12 – **Final Progress Report** (Yurok Project 5104)
F13AP00720 – FY 13 – **Interim Progress Report** (Yurok Project 5116)

Project Background & Accomplishments

Historically the Klamath River Basin contained bountiful anadromous fish runs, supporting indigenous peoples throughout the region. Anthropogenic activities over the last 150 years, coupled with natural events, have resulted in widespread degradation of native fish habitats and substantial declines in anadromous fish populations. The declining health and productivity of the Klamath River's anadromous fisheries is of great cultural and economic concern to the Yurok Tribe. To help address this decline, the Yurok Tribal Fisheries Program (YTFP) and Yurok Tribe Watershed Restoration Department (YTWRD) initiated a large-scale, coordinated watershed restoration effort in the Lower Klamath Sub-basin in the late 1990s. Restoration activities conducted have focused on decommissioning roads and removing stream crossings, planting native conifers in riparian habitats, installing constructed wood jams in fluvial habitats, and constructing complex off-channel habitats (e.g. alcoves, wetlands) in priority watersheds.

This report documents watershed assessment, planning, coordination, and restoration efforts conducted by YTFP and YTWRD in the Lower Klamath River Sub-basin during the period October 1, 2013 through September 30, 2014 (Agreements F12AP00477 & F13AP00720).

- **Restoration Planning & Effectiveness Monitoring**

During the project period, YTFP continued working with our restoration specialist Rocco Fiori (Fiori GeoSciences - FGS) to plan, prioritize, implement, and assess restoration effectiveness in the Lower Klamath River Sub-basin. Restoration priorities and treatment plans developed during the report period continued to be guided by fisheries research and effectiveness monitoring currently being conducted by YTFP, other basin partners (i.e. Karuk Tribe & Mid-Klamath Watershed Council), and other Pacific Northwest practitioners.

Hunter Creek Planning

YTFP and FGS met with staff from Green Diamond Resource Company (GDRC – landowner) to discuss the potential of expanding our floodplain habitat enhancement efforts in Hunter Creek. GDRC has agreed to work with us to find creative road realignments or treatments to facilitate increased floodplain connectivity and improved geomorphic function in this priority off-estuary watershed. YTFP and YTWRD are currently implementing comprehensive fisheries (Figure 1) and upslope restoration throughout the watershed (Beesley and Fiori 2013a & 2013b).

Waukell Creek Planning

YTFP and FGS continued developing wetland, stream, and floodplain enhancement strategies in the Waukell Creek watershed, a priority off-estuary tributary. Fisheries research conducted in off-estuary watersheds over the last several years have revealed significant use of these tributaries by both natal and non-natal juvenile coho salmon (Soto et al. 2008; Hillemeier et al. 2009; Hiner 2009; Silloway 2010; Hiner et al. 2011; Silloway and Beesley 2011). Restoration objectives include improving hydrologic, geomorphic, and riparian function to increase juvenile salmonid rearing capacity and productivity. YTFP and FGS continued working with Aldaron Laird (Environmental Planner), multiple landowners, and resource agencies to develop and permit restoration designs for two proposed reaches in Waukell Creek (Upper and Lower) (Figure 2). YTFP and FGS finalized The Lower Project Reach designs, worked with Mr. Laird

to secure all required project permits, and obtained a majority of the wood needed to conduct the project (Figure 3). YTFP plans to begin restoration activities in September 2015.

YTFP and FGS continued trying to coordinate with the Resighini Rancheria Council and staff regarding their proposed road improvement project that includes replacing the Klamath Beach Road (KBR) stream crossing. The Resighini Rancheria's KBR project continues to suffer setbacks due to changes in funding, design modifications, and permitting difficulties. Unfortunately, their inability to move forward has caused a significant delay to our restoration planning efforts for the wetlands located in the Upper Treatment Reach (Figure 2). We continue coordinating with the Resighini Rancheria regarding their KBR project in the hopes they will satisfy permitting agency questions and requirements in time to implement in summer 2015.

Terwer Creek Planning

YTFP and FGS completed the Terwer Creek Off-channel Habitat Restoration Feasibility Study with funding from the California Department of Fish and Wildlife's (CDFW) Fisheries Restoration Grant Program (FRGP) and U.S. Bureau of Reclamation (BOR - Native American Affairs Program Funds) (Beesley and Fiori 2014a). Project goals included assessing the feasibility of increasing winter rearing habitat for native salmonids in lower Terwer Creek and using the collected information to develop potential restoration alternatives for lower Arrow Mills Creek (Terwer Creek tributary). During the report period, YTFP and FGS completed various project related studies and produced several project reports including the final report. Project methods, results, restoration design alternatives, and reports were presented to a Technical Advisory Committee (TAC) comprised of staff from CDFW, U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), and the landowner (GDRC). YTFP and FGS developed and presented two off-channel habitat enhancement alternatives for the project reach. We are currently awaiting final landowner approval of the preferred design alternative and hope to complete project permitting requirements in time to implement the project in summer 2015.

Klamath River Estuary

With BOR funding, YTFP worked with the Yurok Tribe Environmental Program (YTEP), and the Yurok Tribe GIS Department to hire an experienced consulting firm to provide hands-on bathymetric survey training to Yurok staff while performing a survey of the Klamath River Estuary. Project goals included increasing Tribal capacity, testing Tribal survey equipment, establishing bathymetric survey protocols for the estuary, documenting current bathymetric conditions and analyzing past data sets to assess habitat changes over time (e.g. estuary scour and fill). A successful bathymetric survey of the estuary was conducted in late summer 2013 and the Yurok GIS staff worked with the consultant to complete the digital elevation model (DEM) for the project. The report also included an assessing scour and fill changes occurring in the estuary (2004-2013) (GBA 2013). The 2013 DEM created for the estuary is an invaluable resource planning tool. In addition, the training received through this project greatly improved the Yurok Tribe's ability to continue monitoring estuary bathymetry for resource planning needs.

Stream Channel Monitoring

YTFP crews continued conducting topographic surveys of fluvial habitats within the Lower Klamath Sub-basin to document baseline conditions and to assess habitat changes following

implementation of stream and riparian habitat restoration activities. This channel monitoring data allows us to quantitatively assess channel changes over time, document project performance, and guide future restoration in the Lower Klamath.

During this reporting period, YTFP survey crews completed the following topographic surveys:

Hunter Creek

- As-built survey of the 2013 restoration reach in Hunter Creek (Fall 2013)
- Post-project survey of the 2013 restoration reach in Hunter Creek (Spring 2014)
- Baseline survey of the 2014 restoration reach in Hunter Creek (Summer 2014)

Terwer Creek

- Restoration planning surveys in Lower Terwer Creek (Winter 2014);
- RTK GPS survey of Lower Terwer Creek project benchmarks with help from the USFWS

McGarvey Creek

- As-built survey of the 2013 restoration reach in McGarvey Creek (Fall 2013)
- Post-project survey of the 2013 restoration reach in McGarvey Creek (Spring 2014)
- Baseline survey of the 2014 restoration reach in McGarvey Creek (September 2014)

Waukell Creek

- Restoration planning surveys in Lower Waukell Creek (Winter 2014);
- Baseline survey of the Lower Treatment Reach of Waukell Creek (September 2014)

Off-Channel Habitat Monitoring

YTFP continued assessing habitat conditions, water quality, and fish use in newly constructed off-channel habitats in Hunter Creek, McGarvey Creek, and Terwer Creek to document post-restoration conditions (Silloway 2010; Silloway and Beesley 2011; Hiner et al. 2011; YTFP 2012 & 2013; Beesley and Fiori 2014b). Coordinating physical habitat, water quality, and fisheries investigations greatly increase our understanding of habitat and fish response to restoration efforts and is invaluable for planning, implementing, and adapting fisheries restoration in the Lower Klamath River Sub-basin. YTFP is in the process of summarizing results and writing a detailed project report for the monitoring work conducted during 2013-2014.

YTFP has been working closely with our partners the Karuk Tribe and the Mid-Klamath Watershed Council to inform resource agency staff and other stakeholders of our off-channel habitat enhancement efforts (i.e. design/implementation process, monitoring results). Off-channel habitat enhancement is a fairly “new” restoration practice in California and we are among the only practitioners implementing these projects. Therefore there is a real need to share our approach and the lessons we are learning with the restoration community. Outreach efforts include leading field tours of our projects and presenting our work at various other forums.

• Fisheries Restoration Field Tours, Presentations & Trainings

In October 2013, Sarah Beesley (YTFP) gave a presentation on the fisheries restoration partnership with the Karuk Tribe and the Mid-Klamath Watershed Council at the North Coast

Resource Partnership's (NCRP) conference in Fortuna, California. YTFP also helped prepare a Yurok restoration project poster for the conference and a video of Yurok fisheries restoration (created by the Seventh Generation Fund) was also showed at the NCRP conference.

In February 2014, staff from YTFP attended River Restoration Northwest's 13th Annual Stream restoration Symposium in Stevenson, Washington. The symposium focused on all aspects of fisheries restoration including planning, permitting, and effectiveness monitoring. The symposium provided great learning and networking opportunities to our fisheries staff.

In May 2014, Sarah Beesley (YTFP) traveled to Yreka to participate in a meeting with PacifiCorp and the National Fish and Wildlife Foundation (NFWF) to discuss upcoming funding opportunities through their Klamath River Coho Enhancement Fund. Sarah also gave an update on our FY2011 Klamath Coho Enhancement project that is focused on restoring fisheries habitat in McGarvey Creek and assessing the performance of recently constructed off-channel habitats.

In June 2014, Sarah Beesley (YTFP) and Rocco Fiori (FGS) attended a field tour of off-channel habitat restoration sites in the Mid-Klamath. The tour was hosted by the Karuk Tribe and the Mid-Klamath Watershed Council and the purpose was to discuss restoration designs and effectiveness monitoring with staff from CDFW. The following day, Sarah and Rocco continued the off-channel habitat field tour for CDFW staff on sites located in the Lower Klamath.

In August 2014, Sarah Beesley (YTFP) and Rocco Fiori (FGS) led a fairly large group of people on a field tour of our restoration projects in Hunter and McGarvey creeks as part of the Salmonid Restoration Federation's Coho Confab. This annual symposium focuses on innovative coho salmon recovery activities occurring throughout the range of California coho populations.

YTFP staff attended a 2-Day Microsoft Excel Training that focused on the basics of using the software and then moved to more advanced training on the second day. YTFP uses Excel worksheets and databases extensively; therefore, the training was extremely valuable to our staff.

- **Fisheries Restoration Implementation**

- **Stream and Floodplain Enhancement**

- During this period, YTFP and FGS conducted the following restoration activities: 1) installed over 20 constructed wood jams (CWJs) and planted native trees in Hunter Creek (East Fork to SubDivision CWJ Reach – Figures 1, 4-5); and 2) constructed a fourth off-channel habitat feature in McGarvey Creek (McGarvey Alcove IV - Figure 6).

- **Riparian Forest Restoration**

- YTFP continued operation of the Yurok Tribal Native Plant Nursery (YTNP) at the Yurok Fisheries office in Klamath. The nursery and greenhouse provides quality employment opportunities with staff receiving training in native seed collection, germination and propagation, and other related nursery skills (e.g. installing water lines and operating greenhouse systems, maintaining stock, conducting inventories). The YTNP currently provides hundreds of native conifer and deciduous saplings and shrubs each year for Lower Klamath watershed restoration

projects. During this reporting period, crews maintained the nursery stock, transplanted seedlings into larger containers, collected and planted seeds, and conducted stock inventories.

In fall 2014, YTFP restoration crews installed numerous willow baffles and planted over 50 native trees in the 2014 Hunter Creek project reach. All the willow planted in Hunter Creek was selectively harvested from baffles planted in lower Terwer Creek by YTFP during the mid-2000s. The Terwer baffles are doing extremely well and can easily support selective thinning for restoration purposes. All the trees planted in Hunter Creek were obtained from the YTNPN.

Restoration Wood Timber Harvest

A critical limitation to implementing instream habitat restoration projects in the Lower Klamath is the difficulty obtaining high quality, whole tree materials, especially long stems with rootwads attached. We continued working with GDRC, YTWDRD, and other organizations to obtain whole tree materials from local projects. However, these salvage efforts have not produced enough wood to complete already funded restoration projects. Therefore, in summer 2014, YTFP hired an American Indian owned company (McCullough Construction, Inc.) to harvest and deliver whole tree materials to Lower Klamath restoration sites. They delivered a total of 405 logs with rootwads (35-25 ft length) attached and an additional 722 manufactured logs (35-15 ft length). The trees were harvested from a GDRC timber harvest unit located in the Lower Klamath.

• Proposals Submitted

YTFP Lower Klamath Division (LKD) submitted the following proposals:

U.S. Bureau of Reclamation Native American Affairs Funding (NAAP) (**Secured Spring 2014**):

- Restoration and Planning for the Lower Klamath River Sub-basin - \$100,000

U.S. Bureau of Reclamation – Yreka Area Office (**Secured Summer 2014**):

- Lower Klamath Sub-Basin Restoration Assistance - \$45,000
- Lower Klamath Restoration Wood Acquisition - \$50,000

National Fish and Wildlife Foundation Funding (Bring Back the Natives & PacifiCorp Funds):

- Enhancing Off-Channel Rearing Habitat in Lower Terwer Creek - \$26,500
- Monitoring Coho Salmon Response to Habitat Restoration - \$26,500

Pacific Coastal Salmon Recovery Fund FY 2013-2014:

- Lower Klamath Tributary Outmigrant Trapping - \$160,000 (**Secured Spring/Fall 2014**)

U.S. Fish and Wildlife Partners for Fish and Wildlife Program (**Secured Spring 2014**):

- Off-Estuary Habitat Enhancement of Waukell Creek, Lower Klamath River - \$10,000

U.S. Fish and Wildlife CFDA Program Funds (**Secured Summer 2014**):

- Lower Klamath Sub-basin Coordination and Planning - \$15,000

- **Meetings Attended**

YTFP and YTWRD held regular meetings throughout the project period to coordinate ongoing and future sub-basin assessment, monitoring, and restoration activities.

YTFP and YTWRD held regular meetings with GDRC during the project period. These meetings were held to discuss ongoing and future watershed assessment, monitoring, and restoration activities within the Lower Klamath River Sub-basin.

YTFP and YTWRD met on a regular basis with the Yurok Tribe Council during the project period to hold fisheries and watershed restoration related planning sessions; and to discuss and seek approval from the Council for proposed watershed restoration, assessment, and monitoring projects within the Lower Klamath River Sub-basin.

YTFP and YTWRD worked regularly with Rocco Fiori (FGS) during the project period to plan ongoing and future restoration, assessment, and monitoring projects in the Lower Klamath River.

YTFP and YTWRD staff met regularly with staff from the CDFW, BOR, NOAA, NFWF, and USFWS during the project period to discuss ongoing and future restoration projects/proposals, discuss project performance/techniques, and to conduct pre- and post-project reviews.

YTFP met several times with the Resighini Rancheria (RR's) Tribal Council and LACO Engineering staff to discuss the RR's proposed KBR project and restoration in Waukell Creek.

YTFP worked closely with staff from the BOR, Karuk Tribe, Larry Lestelle, Mid-Klamath Watershed Council (MKWC) to plan and implement the Klamath River Coho Salmon Ecology Study. As part of this collaboration, YTFP staff conducted a three day meeting with Larry Lestelle, Rocco Fiori (FGS), Karuk Tribal biologists, and MKWC staff to visit fisheries restoration projects in the Mid-Klamath and Lower Klamath. The field tours included a trip to the Shasta River Big Springs area with staff from CDFW and The Nature Conservancy, several constructed off-channel habitats in Mid-Klamath, and multiple Lower Klamath restorations sites. The meeting concluded with a Klamath Coho Ecology Study planning session in Klamath.

YTFP continued participating in professional committees and programs such as the Peer Review Committee for CDFW's FRGP, the California Coho Salmon Recovery Team, the Pacific Marine and Estuary Fish Habitat Partnership, and the North Coast Resource Partnership.

YTFP reviewed a revised version of NOAA's recovery plan for Southern Oregon / Northern California Coast coho salmon and then provided NOAA with additional comments on the plan.

YTFP continued coordinating with YTEP as part of their Lower Klamath Wetland Program.

- **YTFP Lower Klamath Division Project Reports Completed**

Beesley, S. and R. Fiori. 2014. Enhancement of Rearing Habitat for Natal and Non-Natal Salmonids in McGarvey Creek - Lower Klamath River. Yurok Tribal Fisheries Program, Klamath, California.

Beesley, S. and R. Fiori. 2014. Stream & Floodplain Enhancement of Lower McGarvey Creek: 2013 - Lower Klamath River. Yurok Tribal Fisheries Program, Klamath, California.

Beesley, S. and R. Fiori. 2014. Terwer Creek Off-Channel Habitat Restoration Feasibility Study – Lower Klamath River. Yurok Tribal Fisheries Program, Klamath, California.

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Beesley, S. and R. Fiori. 2013a. Stream & Floodplain Enhancement of East Fork Hunter Creek, Lower Klamath River: Phase I. Yurok Tribal Fisheries Program, Klamath, California.

Beesley, S. and R. Fiori. 2013b. Stream & Floodplain Enhancement of Hunter Creek: 2013 - Lower Klamath River. Yurok Tribal Fisheries Program, Klamath, California.

Beesley, S. and R. Fiori. 2014a. Terwer Creek Off-Channel Habitat Restoration Feasibility Study – Lower Klamath River. Yurok Tribal Fisheries Program, Klamath, California.

Beesley, S. and R. Fiori. 2014b. Enhancement of Rearing Habitat for Natal and Non-Natal Salmonids in McGarvey Creek - Lower Klamath River. Yurok Tribal Fisheries Program, Klamath, California.

Fiori, R. 2013. Lower Waukell Creek Wood Loading Project-Phase 2. Prepared by Fiori GeoSciences for the Yurok Tribal Fisheries Program. Klamath, California.

Gahagan & Bryant Associates, Inc. (GBA). 2013. Klamath River Estuary Bathymetric Survey Report. Prepared for the Yurok Tribe. Camas, Washington.

Hillemeier, D., T. Soto, S. Silloway, A. Corum, M. Kleeman, and L. Lestelle. 2009. The Role of the Klamath River Mainstem Corridor in the Life History and Performance of Juvenile Coho Salmon (*Oncorhynchus kisutch*). Phase II Report Submitted to the U.S. Bureau of Reclamation, Klamath Area Office, Klamath Falls, Oregon.

Hiner, M. 2009. Installation of Stream-Width PIT tag Interrogation Systems to Track Habitat Use and Non-Natal Rearing Patterns of Juvenile Coho in Tributaries to the Lower Klamath River. Yurok Tribal Fisheries Program, Klamath, California.

Hiner, M., S. Silloway, A. Antonetti, and S. Beesley. 2011. Lower Klamath Tributaries Riparian Restoration Projects and Yurok Tribal Native Plant Nursery. Yurok Tribal Fisheries Program, Klamath, California.

Silloway, S. 2010. Fish Surveys Related to the Proposed Del Norte Highway 101 Klamath Grade Raise Project. Yurok Tribal Fisheries Program, Klamath, California.

Silloway, S. and S. Beesley. 2011. Fish Surveys Related to the Proposed Del Norte Highway 101 Klamath Grade Raise Project: Addendum Report 2010-2011. Yurok Tribal Fisheries Program, Klamath, California.

Soto, T., A. Corum, H. Voight, D. Hillemeier, and L. Lestelle. 2008. The Role of the Klamath River Mainstem Corridor in the Life History and Performance of Juvenile Coho Salmon (*Oncorhynchus kisutch*). Phase I Report Submitted to the U.S. Bureau of Reclamation, Klamath Area Office, Klamath Falls, Oregon.

Yurok Tribal Fisheries Program. 2012. Juvenile coho salmon use of constructed off-channel habitats in two Lower Klamath River tributaries: McGarvey Creek & Terwer Creek. Yurok Tribal Fisheries Program, Klamath, California.

Yurok Tribal Fisheries Program. 2013. Juvenile coho salmon use of constructed off-channel habitats in two Lower Klamath River tributaries: McGarvey Creek & Terwer Creek. Yurok Tribal Fisheries Program, Klamath, California.

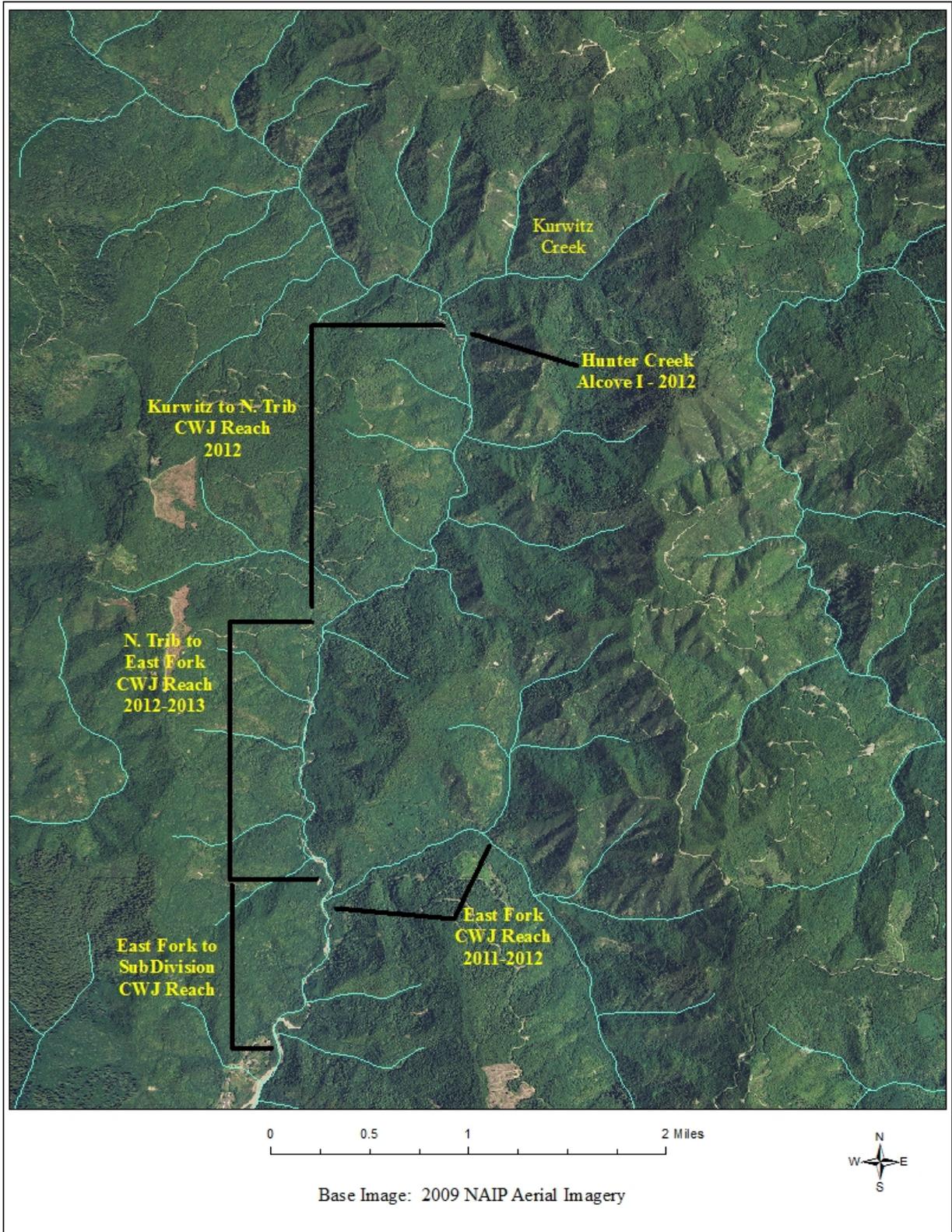


Figure 1. Map depicting fisheries restoration reaches in Hunter Creek, Lower Klamath River.



Figure 2. Map depicting fisheries restoration reaches in Waukell Creek, Lower Klamath River.

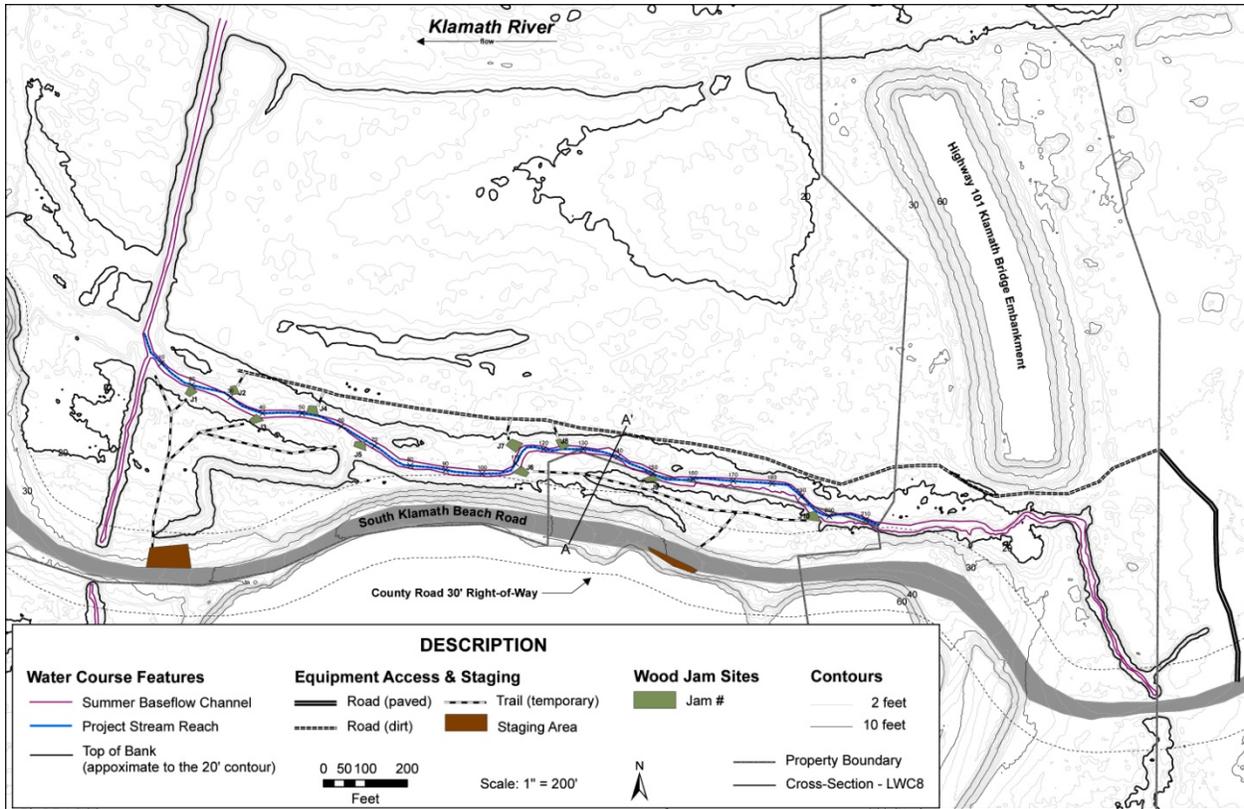


Figure 3. Restoration design for the Lower Treatment Reach of Waukell Creek (Fiori 2013).



Figure 4. A constructed wood jam (Bar Apex Jam #4) in Hunter Creek during construction (Left - 09/18/14) and during the first flows following construction (Right - 10/23/14).



Figure 5. A constructed wood jam (Bar Apex Jam #3) in Hunter Creek during construction (Left - 09/18/14) and during the first flows following construction (Right - 10/23/14).

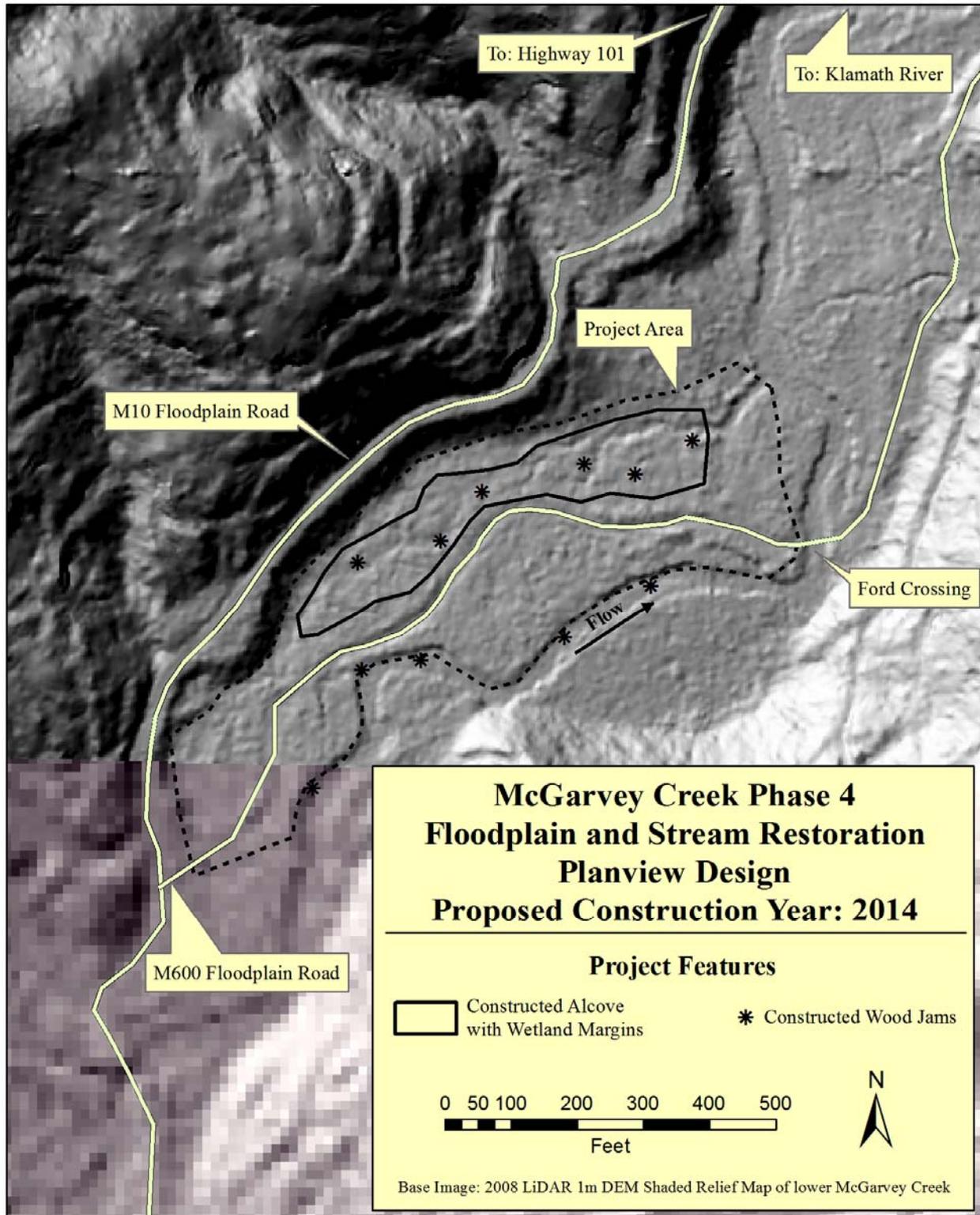


Figure 6. Map depicting the 2014 restoration design implemented in Lower McGarvey Creek.