

Lower Klamath Sub-Basin Coordination & Planning - FYs 2013-2014

Annual & Final Progress Report: 10/01/14 – 09/30/15



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Agreement Numbers:
F13AP00720 – FY 13 – **Final Progress Report** (Yurok Project 5116)
F14AP00345 – FY 14 – **Interim Progress Report** (Yurok Project 5356)

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, 2014 through September 30, 2015 (Agreements F13AP00720 & F14AP00345).

• 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.

West Fork Blue Creek

YTFP and FGS worked with YTWRD and staff from Green Diamond Resource Company (GDRC - current landowner) to develop a coordinated road decommissioning and stream habitat enhancement project in West Fork Blue Creek (Figure 1). Although considered a salmon stronghold, the Blue Creek watershed has experienced channel widening, sedimentation and loss of riparian forests due to large floods, historic logging and road building practices, and livestock grazing (Gale and Randolph 2000; Beesley and Fiori 2007 & 2008). Rehabilitating West Fork Blue Creek is a high priority because the system provides valuable spawning and rearing habitat for Chinook, coho, steelhead, and coastal cutthroat and vital cold water inputs to Blue Creek.

Specific treatments planned:

- Decommission 2.1 miles of legacy logging roads, including removal of ~ 8,980 yd³ of sediment saved and a total volume of 14,389 yd³ of fill from 22 sites composed of stream crossings, mass movements, unstable side-cast fill and crossroad drains;
- Install 21 constructed wood jams (CWJs) and whole trees within the project reach and rehabilitate floodplains currently impacted by abandoned timber roads; and
- Plant 500 native conifers in riparian habitats to enhance existing forest conditions and promote long-term benefits including increased channel stability and wood recruitment.

McGarvey Creek

YTFP and FGS coordinated with GDRC staff to plan the next phase of fisheries habitat restoration in McGarvey Creek. To date, YTFP and FGS have installed numerous CWJs within in lower McGarvey Creek and constructed four off-channel wetlands (Alcoves I-IV) (Figure 2). Based on published research, Yurok led coho ecology studies in the Lower Klamath, and the increased need for the ecosystem services that beaver dams provide, YTFP and FGS requested landowner permission to install beaver dam analogues (BDAs) in two key locations within lower McGarvey Creek. Anticipated benefits of the proposed BDAs include 1) increasing the amount of summer rearing habitat by storing surface waters and recharging ground water tables, 2) improving winter rearing conditions in mainstem McGarvey Creek by increasing the amount of slow velocity refuge areas, and 3) increasing rearing habitat resiliency to environmental perturbations such as seasonal and/or /pro-longed drought and potential future climate change impacts. Performance assessments and outreach proposed as part of this project will be essential contributions to ongoing coho salmon ecology studies and regional salmonid recovery efforts.

Lower Klamath Land Acquisition Planning – Phase II

YTFP worked with several Yurok departments and Western Rivers Conservation to develop a DRAFT Management Plan (the Plan) for the area known as the Phase II Land Acquisition (Figure 3). A portion of the Phase II lands will be managed as a Yurok Tribal Community Forest while the lower portion of Blue Creek is proposed as a Salmon Sanctuary focused on species recovery. The Plan provided extensive background information on the resources of the area, goals/objectives/management strategies for the Community Forest and the Salmon Sanctuary, and listed future actions such as environmental studies and habitat restoration efforts.

Prior to drafting the Plan, YTFP and FGS developed the next phase of fisheries and watershed restoration planning for lower Blue Creek. With funding from the U.S. Bureau of Indian Affairs (BIA), U.S. Bureau of Reclamation (BOR), and Department of Water Resources (DWR), YTFP and FGS will be conducting a number of physical habitat assessments to characterize historic and existing conditions, factors currently limiting ecosystem function and resiliency, and hydrologic/hydrogeologic conditions. The objective of this project is to develop feasible and effective restoration designs and a prioritized strategy for enhancing coastal resources within the Blue Creek watershed. Another critically important aspect of the project will be coordinating with multiple tribal departments, Yurok leadership, and various stakeholders to facilitate an integrated and transparent design process to help build support for the future restoration actions.

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 2014 restoration reach in Hunter Creek (Fall 2014)

- Post-project surveys of the 2014 restoration reach in Hunter Creek (Winter & Spring 2015)
- Baseline survey of the 2015 restoration reach in Hunter Creek (Summer 2015)

Terwer Creek

- Baseline surveys of the 2015 restoration reach in Hunter Creek (Fall 2014 & Summer 2015)

McGarvey Creek

- As-built survey of the 2043 restoration reach in McGarvey Creek (Fall 2014)
- Post-project survey of the 2014 restoration reach in McGarvey Creek (Summer 2015)

Waukell Creek

- Baseline survey of the Lower Treatment Reach of Waukell Creek (Summer 2015)

Hoppaw Creek

- Baseline survey of the Lower Treatment Reach of Hoppaw Creek (Summer 2015)

Off-Channel Habitat Monitoring

YTFP continued assessing habitat conditions, water quality, and fish use in newly constructed off-channel habitats (i.e. alcoves) 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 2014). Coordinating 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 detailed case studies for the alcoves constructed in Lower Klamath tributaries. During February 2015, YTFP monitored water quality in McGarvey Creek alcoves III and IV.

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 March 2015, Sarah Beesley (YTFP) and Rocco Fiori (FGS) gave presentations at the 33rd Annual Salmonid Restoration Federation Conference in Santa Rosa, California. One of the presentations provided an overview of Yurok fisheries restoration in the Lower Klamath and the second provided a more detailed discussion of the implementation techniques (i.e. wood loading, off-channel wetland construction) being employed by YTFP and FGS in the Lower Klamath.

YTFP participated in a meeting with PacificCorp and the National Fish and Wildlife Foundation (NFWF) which focused on off-channel habitat enhancement efforts in the Klamath River. YTFP

presented a summary of the off-channel habitat construction and monitoring work conducted by YTFP and our restoration consultant Rocco Fiori in priority Lower Klamath tributaries.

YTFP gave a presentation to the North Coast Regional Water Quality Control Board as part of a panel comprised of organizations conducting water quality improvement activities in the Klamath Basin. The presentation highlighted the water quality and fisheries protection, conservation, and watershed restoration work being conducted by the Yurok Tribe Environmental Program (YTEP), YTFP, and YTWRD in the Lower Klamath River Sub-basin.

- **Fisheries Restoration Implementation**

- **Stream and Floodplain Enhancement**

During summer-fall 2015, YTFP and FGS conducted the following restoration activities in priority Lower Klamath tributaries: 1) installed 17 CWJs in Hunter Creek (East Fork to SubDivision CWJ Reach – Figures 4-5); 2) installed 30 CWJs in Terwer Creek (Terwer Gage CWJ Reach – Figures 6-7); and 3) installed 10 CWJs in lower Waukell Creek (Figure 8).

- **Riparian Forest Restoration**

YTFP continued operation of the Yurok Tribal Native Plant Nursery (YTNPN) 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 YTNPN currently provides hundreds of native conifer and deciduous saplings and shrubs each year for Lower Klamath watershed restoration projects. During this reporting period crews conducted the following activities: 1) maintained the nursery stock, 2) transplanted seedlings into larger containers, and 3) constructed a French drain around the greenhouse as well as a planting shed and covered work area.

In December 2015, YTFP planted over 100 native trees in riparian habitats of Hunter Creek. All of the trees planted in Hunter Creek were obtained from the YTNPN. In summer 2015, YTFP restoration crews installed and watered numerous willow baffles in the 2015 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.

- **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, YTWRD, and other organizations to obtain whole tree materials from local projects. In summer 2015, 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 199 logs with rootwads (35-25 ft length) attached and an additional 238 manufactured logs (35-15 ft length). The trees were harvested from a GDRC timber harvest unit located in the Lower Klamath.

- **Watershed Restoration Implementation**

During winter 2014-2015, YTWRD road crews conducted storm inspections and cleaned inboard ditches and culverts to prevent sedimentation of tributaries on the Yurok Tribe's Phase I property and on other roads within the Yurok Reservation. Maintaining Yurok roads during storm events is a critically important land stewardship and resource and community protection measure.

During summer-fall 2015, YTWRD conducted road decommissioning work in several priority locations in the Hunter Creek watershed. During the 2015 season, YTWRD decommissioned 1.74 miles of road, removed 14 stream crossings, and treated seven mass wasting sites for a total of 28,340 cubic yards of sediment saved. This work is scheduled to continue in 2016.

YTWRD also worked closely with the Trinity River Division of YTFP, BOR, and several other partners to implement the Limekiln Restoration Project on the Trinity River in Lewiston, California. YTWRD also helped supply the whole tree materials for this project as well as implemented the annual Salmonid Spawning Gravel Augmentation Project in the Trinity River.

- **Proposals Submitted**

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

Sarah Beesley (YTFP) and our restoration consultant Rocco Fiori (FGS) provided technical support to Western Rivers Conservation on two California Proposition 1 grant applications that were requesting funds to support Phase II land acquisition in the Lower Klamath.

Department of Water Resources – California Proposition 84 Grant Fund (**Award Pending**):

- Yurok Watershed Restoration and Drinking Water Security - \$702,463

This proposal was a coordinated effort between the Yurok Planning Department, YTFP, and YTWRD and requested funding to accomplish watershed restoration planning and implementation in Terwer Creek and Blue Creek as well as funding to provide water storage tanks for five Tribal member households to improve drinking water security to folks currently relying on tributary surface flows for domestic use. The tanks will allow tribal members to store water during winter and thereby reduce summer drafting in vital cold water tributaries.

U.S. Bureau of Reclamation Native American Affairs Funding (NAAP) (**Secured August 2015**):

- Restoration and Planning for the Lower Klamath River Sub-basin - \$144,875

U.S. Bureau of Reclamation – Yreka Area Office (**No Funding Available**):

- Lower Klamath Sub-Basin Restoration Assistance - \$150,000

Pacific Coastal Salmon Recovery Fund FY 2015 (**Secured Spring 2015**):

- Lower Klamath Tributary Outmigrant Trapping - \$80,000
- Instream and Riparian Restoration of Terwer Creek - \$13,000

U.S. Fish & Wildlife Service (USFWS) Partners for Fish & Wildlife Program (**Secured Fall 2014**):

- Restoring Off-Estuary Habitat in Hoppaw Creek, Klamath River - \$46,329

- Enhancement of Off-Channel Rearing Habitats of Hunter Creek: Phase II - \$90,000

U.S. Fish & Wildlife Service (USFWS) CFDA Program Funds (**Secured Summer 2015**):

- Lower Klamath Sub-basin Coordination and Planning - \$20,000

U.S. Bureau of Indian Affairs Tribal Climate Change Adaption Fund:

- Yurok Coastal Resource & Climate Adaptation Workshop - \$52,054 (Not Funded)
- Coastal Resource Restoration Planning in Blue Creek - \$198,000 (**Secured June 2015**)
- Coastal Resource Planning within the Klamath Estuary - \$232,000 (**Secured June 2015**)

CA Department of Fish and Wildlife (CDFW) Fisheries Restoration Grant Program (**Not Funded**):

- Long-Term Monitoring of Coho Response to Off-Channel Habitat Restoration - \$114,525
- Turwar Road Decommissioning & Large Wood Gathering Project - \$455,228
- West Fork Blue Creek Sediment Reduction and Road Removal Project - \$246,786

National Oceanic and Atmospheric Administration (NOAA) Coastal Habitat Restoration Fund:

- Restoration of Lower Klamath River Fisheries and Riparian Habitats - \$512,125
(**Partial Year 3 Funding Secured \$222,360 – Summer 2015**)

- **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.

YTWRD coordinated with the NRCS regarding management and enhancement of Phase I lands.

YTFP continued participating in CDFW's Coho Recovery Team (CRT) which is comprised of numerous California stakeholder groups. Sarah Beesley (YTFP) and our restoration consultant Rocco Fiori (FGS) attended a CRT meeting in Sacramento. The meeting focused on several

coho recovery actions occurring throughout the state. Mr. Fiori gave a presentation focused on the habitat restoration work currently being implemented in Lower Klamath tributaries.

YTFP met with Yurok Wildlife staff to plan for a coordinated wetland enhancement and wood duck project. Yurok staff led our USFWS grant manager on a tour of Lower Klamath wetland restoration areas and discussed placement of wood duck nesting boxes. Yurok Wildlife will be installing and monitoring wood duck nest boxes in several priority restoration areas.

YTFP coordinated with the California Department of Transportation (CalTrans) regarding their proposal to replace the U.S. Highway 101 bridges over Panther Creek and Hunter Creek. CalTrans is required to replace the existing structures to meet earthquake safety standards. YTFP is providing fisheries and habitat information for the area, reviewing the designs and environmental documents associated with the project, and providing input to help ensure resource impacts are avoided and/or minimized and adequately mitigated if deemed necessary.

Sarah Beesley (YTFP) attended a Project Development Workshop for Tribal staff interested in seeking funding for water resource related projects. The workshop was put on by DWR's Integrated Regional Water Management grant managers and was focused on identifying challenges and potential solutions, Tribal project development, and project ranking.

YTFP continued participating in the Pacific Marine and Estuarine Fish Habitat Partnership (PMEP). PMEP is one of 19 nationally recognized partnerships whose mission is to work with partners to protect, enhance, and restore ecological processes and habitats within California, Oregon, and Washington estuaries and nearshore marine environments to sustain healthy native fish communities and support sustainable human uses that depend on healthy fish populations. Sarah Beesley (YTFP) has served on the PMEP steering committee since 2010. During this reporting period, Sarah Beesley (YTFP) attended the annual steering committee meeting in Long Beach, Washington. The meeting focused on PMEP's large-scale, coordinated effort to assess estuarine and near-shore marine habitats and compile/analyze fisheries information to help identify priority protection and restoration actions along the Pacific coast.

Dave Hillemeier (YTFP), Sarah Beesley (YTFP), and our consulting restoration specialist Rocco Fiori (FGS) met with staff from Six River's National Forest (USFS) to discuss their plans to develop comprehensive fisheries restoration plans for the forest. Sarah and Rocco also led a field tour of restoration work currently being implemented in Hunter Creek to demonstrate the types of strategies that are being implemented in the Lower Klamath.

Sarah Beesley (YTFP-LKD) attended the Tribal California Proposition 1 Funding meeting in Sacramento, California on June 9-10. The meeting was facilitated by DWR and consisted of informational presentations by the agencies who will be administering Proposition 1 funding. The goal was to provide an overview of all the various funding programs available.

YTFP staff and our restoration consultant Rocco Fiori (FGS) participated in a collaborative fisheries restoration exchange which consisted of leading a tour of restoration sites in the Lower Klamath and then attending similar restoration focused tours in the Mid-Klamath and Scott River. Participants included staff from the Karuk and Hoopa Tribes, Salmon River Restoration

Council, Mid-Klamath Watershed Council, YTFP-Trinity, USFS, Scott Valley Resource Conservation District, Larry Lestelle, and the Watershed Research & Training Center-SF Trinity River. The goals included sharing knowledge and lessons learned in an interactive manner.

Sarah Beesley (YTFP) attended the North Coast Resource Partnership (NCRP) Technical Peer Review Committee (TPRC) Proposition 84 Proposal Ranking Meeting in Eureka, California on June 25-26. YTFP coordinated with the Yurok Planning Department and YTWDRD to submit a watershed restoration and drinking water security proposal to this funding source. The TPRC reviewed, scored and then set funding recommendations for consideration by the NCRP Policy Review Panel (PRP) on July 2, 2015. The Lower Klamath Watershed Restoration and Drinking Security proposal was ranked 5 of 57 with full funding recommended (\$702,463). This proposal was approved by the PRP and was thus included in the Final proposal application to DWR.

Sarah Beesley (YTFP) attended a joint meeting of the Peer Review Committee (PRC) and the California Advisory Committee on Salmon and Steelhead in Sacramento. The role of the PRC is to review and score proposal applications for CDFW's Fisheries Restoration Grant Program (FRGP). The intent of the meeting was to introduce new PRC members and discuss issues regarding the FRGP process, learn about the new CDFW Watershed Restoration Grants Branch (i.e. organization, new roles of CDFW Fisheries Branch and grant program focuses). Sarah Beesley (YTFP) also participated in the annual PRC meeting to rank the 2015 FRGP proposals.

YTFP restoration staff met with various Yurok departments (YTWDRD, YTEP, Forestry, and Wildlife) and Western Rivers Conservation staff to coordinate development of the Phase II Land Acquisition Management Plan. A DRAFT plan was completed in December 2015.

Sarah Beesley (YTFP) coordinated with the Karuk Tribe and the Mid Klamath Watershed Council on a proposal they were putting together to help fund a multiple day workshop. The workshop was held in June 2015 and focused on the innovative restoration work being conducted in the Klamath Basin and consisted of field tours of various projects and facilitated discussions.

YTFP met several times with the Resighini Rancheria (RR's) Tribal Council and environmental staff to coordinate YTFP's restoration in Waukell Creek. YTFP was successful in obtaining access through RR lands to complete a habitat improvement project in lower Waukell Creek.

YTFP worked closely with staff from the BOR, Karuk Tribe, Larry Lestelle, Mid-Klamath Watershed Council to plan and implement the Klamath River Coho Salmon Ecology Study.

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

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

Antonetti, A. and E. Partee. 2014. Juvenile Chinook Outmigration Monitoring in Blue Creek, Lower Klamath River, California. Yurok Tribal Fisheries Program, Klamath, California.

Antonetti, A., J. Ray, E. Partee, and S. Silloway. 2014. Assessment and Monitoring of Non-Natal Rearing, Upstream Migration Patterns, and Life History Characteristics of Juvenile Coho and

other Salmonids Utilizing McGarvey Creek (Lower Klamath River Sub-Basin) during 2012 and 2013. Yurok Tribal Fisheries Program, Klamath, California.

Beesley, S. and R.A. Fiori. 2014. Stream & Floodplain Enhancement of Hunter Creek – Technical Memorandum – FY2013. Yurok Tribal Fisheries Program, Klamath, California.

Beesley, S. 2014. Lower Klamath Sub-basin Coordination & Planning – FYs 2012-2013. Yurok Tribal Fisheries Program, Klamath, California.

Beesley, S. 2015. Wood Acquisition for Restoration Projects: Lower Klamath Sub-basin. Yurok Tribal Fisheries Program, Klamath, California.

Partee, E. and S. Beesley. 2015. Monitoring Coho Salmon Response to Habitat Restoration. Yurok Tribal Fisheries Program, Klamath, California.

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Gale, D.B. and D.B. Randolph. 2000. Lower Klamath River Sub-basin Watershed Restoration Plan. Yurok Tribal Fisheries Program, Klamath, California.

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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.

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.

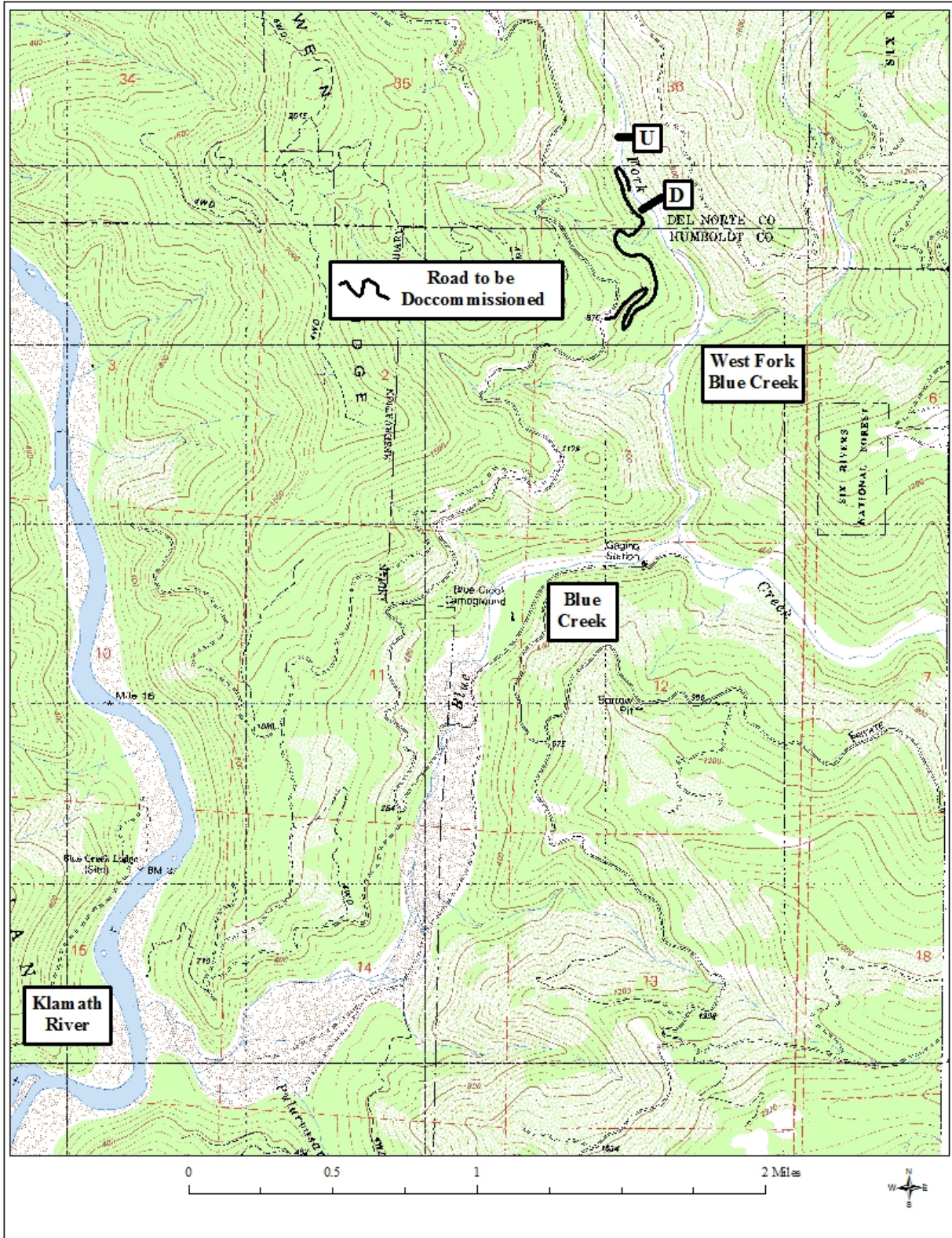


Figure 1. Map depicting the location of the proposed habitat enhancement project reach in West Fork Blue Creek (Phase I), Lower Klamath River, California (D: T13N, R2E, S ½ S 24 – NW ¼ S 1, HBM).

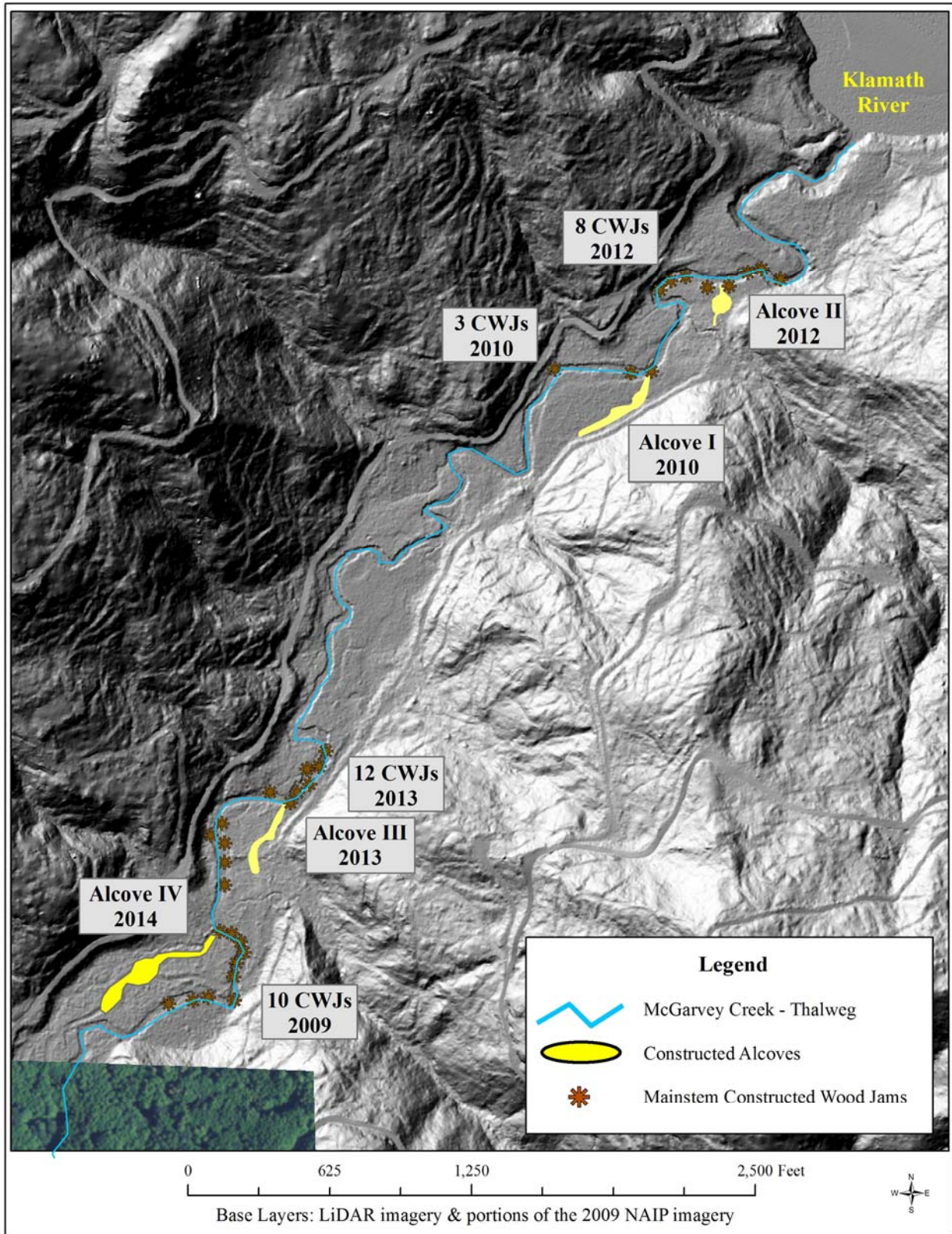


Figure 2. Map depicting a multi-phased approach to rehabilitating stream and floodplain habitats in lower McGarvey Creek, Lower Klamath River Sub-basin, California (Note: Alcove CWJs not depicted).

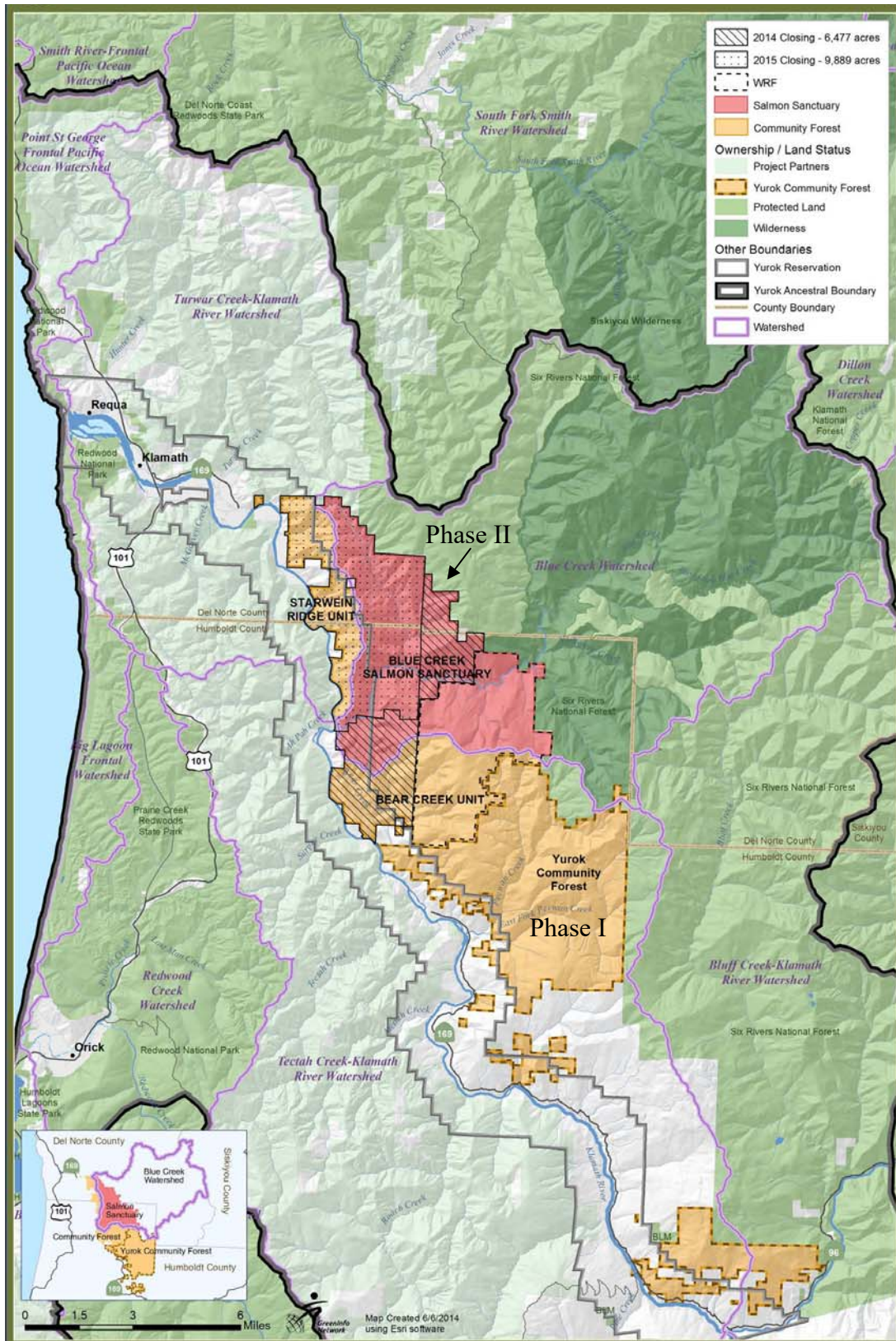


Figure 3. Land acquisition map depicting the proposed land management (Note: Lower Blue Creek, including most of West Fork Blue Creek is designated as a Salmon Sanctuary).



Figure 4. A constructed wood jam site in Hunter Creek prior to installation (Top – 01/18/15) and as-built (Bottom – 10/24/15).



Figure 5. Constructed wood jams in Hunter Creek during installation (October 2015).



Figure 6. Large bar apex jams constructed in Terwer Creek Gage Reach (October 2015).



Figure 7. A series of constructed wood jams along a stream bank in Terwer Creek Gage Reach.



Figure 8. A constructed wood jam in Waukell Creek during installation (Left) and as-built (Right - September 2015).