

Lower Klamath Sub-Basin Coordination & Planning - FY 2011

Final Report



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Agreement Numbers:
81333AG019 – FY 10
81333BG015 – FY 11

Project Accomplishments to Date

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 June 1, 2011 – July 31, 2012.

- **Assessments**

During the project period, YTFP continued conducting geomorphic assessments and monitoring salmonid populations throughout the Lower Klamath River Sub-Basin. YTFP and our restoration specialist Rocco Fiori (Fiori GeoSciences - FGS) have been using these studies and results from the Klamath River Coho Salmon Ecology Study, led by YTFP and the Karuk Tribe, to plan, prioritize, implement, and assess restoration in the sub-basin. YTFP and FGS have been focused on several high priority Lower Klamath tributaries: Hunter Creek, Terwer Creek, McGarvey Creek, Tectah Creek, Waukell Creek, Blue Creek, Salt Creek, and Hoppaw Creek.

Instream Restoration Planning

YTFP and FGS continued updating the Lower Klamath River Sub-basin Restoration Plan (Gale and Randolph 2000). YTFP and FGS created a Lower Klamath River Habitat Restoration Planning Database. This database includes descriptions of restoration techniques and a set of prioritized Lower Klamath restoration projects (ongoing and future). Restoration priorities and techniques were based on current fisheries research conducted by YTFP and other basin partners (e.g. Karuk Tribe & Mid-Klamath Watershed Council) and more up to date physical habitat data. The database is a living document that YTFP continues to modify and/or update regularly.

YTFP and FGS continued developing wetland, stream, and floodplain enhancement strategies in the Salt Creek and Waukell Creek watersheds. Salt Creek and Waukell Creek both drain to the Klamath River estuary. Fisheries research conducted in these 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). Restoration objectives include improving hydrologic, geomorphic, and riparian function to increase juvenile salmonid rearing capacity and productivity in these priority tributaries.

YTFP and the Yurok Tribe Environmental Program (YTEP) worked with FGS, several resource agencies, and stakeholders to help assess the feasibility of enhancing wetland habitats to increase juvenile salmonid rearing capacity in the Salt Creek watershed (Beesley et al. 2012). The study summarized the results of soil sampling efforts conducted at a retired wastewater treatment facility located within the project area and wetland condition assessments.

In Waukell Creek, YTFP and FGS continued working with Aldaron Laird (Environmental Planner), landowners, and resource agencies to develop and permit restoration designs for the two proposed project reaches within Waukell Creek (Upper and Lower Treatment Reaches) (Figure 1). YTFP and FGS continued trying to coordinate with the Resighini Rancheria regarding their proposed road improvement project that includes replacing the Klamath Beach Road (KBR) stream crossing. The KBR project has been delayed for at least two years and due to uncertainties regarding how their design will function as well as affect the Upper Treatment Reach, we have had to put our design efforts for this reach on hold temporarily. We hope to move forward on refining the designs for the Upper Treatment Reach over the next 3-6 months.

YTFP survey crews repeated topographic surveys through the 2009 Waukell Creek wood loading reach to document post-restoration conditions, and through the Lower Treatment Reach (including the KBR stream crossing) to document baseline conditions and to assist restoration design and permitting efforts for this reach. Currently, YTFP is working with state and federal resource agencies to permit a wood loading and riparian planting project in this reach.

YTFP survey crews conducted detailed topographic surveys of lower Hoppaw Creek to document baseline conditions and begin assessing the feasibility of improving winter rearing habitat for juvenile salmonids. Hoppaw Creek enters the north side of the Klamath River estuary ~2.9 miles upstream of the Pacific Ocean. Potential restoration strategies include creating off-channel wetlands and installing constructed wood jams within the lower reaches of the creek.

Instream Restoration Effectiveness Monitoring

Crews continued conducting topographic surveys of fluvial habitats within the Lower Klamath Sub-basin to document baseline conditions and to assess habitat changes associated with implementation of instream enhancement efforts. Topographic monitoring data allows us to quantitatively assess channel changes and project effectiveness, and to guide future restoration.

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

- Post-project surveys of wood loading reaches in McGarvey Creek and Alcove I (Constructed in summer 2010). Baseline surveys of the phase II and III project reaches located in lower McGarvey Creek (To be implemented in summer 2012-13).
- Baseline and post-project surveys of the 2011 enhancement reach in Terwer Creek. Post-winter surveys of the project reach prior to 2012 enhancement activities.
- Baseline surveys of Salt and Waukell project areas to assist restoration planning. Post-project survey of 2009 wood loading reach in Waukell Creek.

- Post-project surveys of the 2011 wood loading reach in East Fork Hunter Creek. Baseline surveys of three project reaches in Hunter Creek: CDFG wood loading, USFWS wood loading, and USFWS Off-channel reach (Figure 2) (To be implemented in summer 2012-13).



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

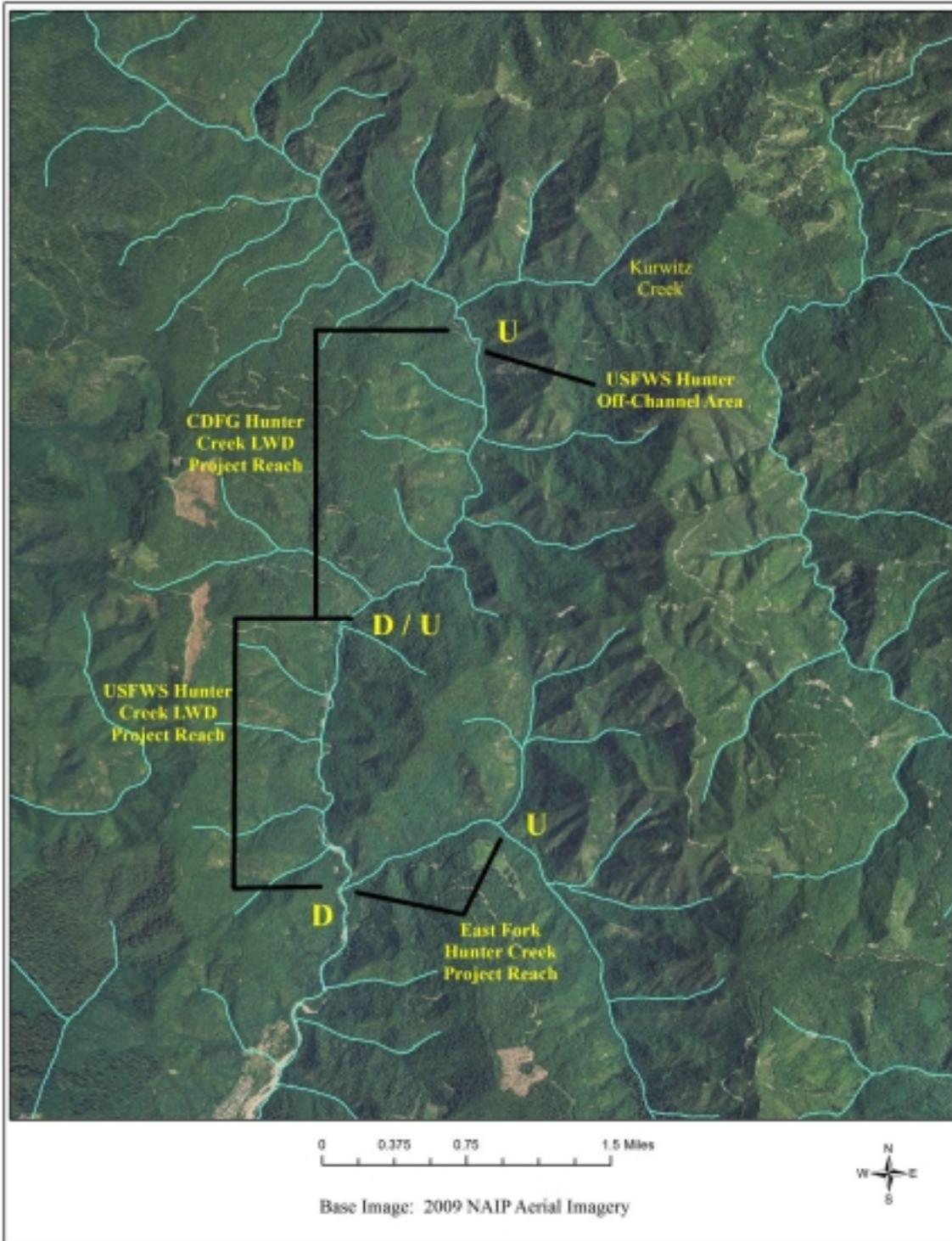


Figure 2. Map depicting several restoration reaches in Hunter Creek, Lower Klamath River.

YTFP survey crews continued assessing water quality parameters in McGarvey Creek Alcove I to document post-restoration conditions in this constructed habitat feature. Crews also monitored water quality conditions during spring in an existing off-channel habitat feature to document conditions prior to enhancement efforts planned for summer 2012. Fisheries crews have also continued to conduct juvenile salmonid population assessments in these and other Lower Klamath off-channel habitats to characterize use by juvenile salmonids, especially coho salmon (Silloway 2010; Silloway and Beesley 2011; Hiner et al. 2011; YTFP 2012).

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.

- **Fisheries Restoration Implementation**

- Stream and Floodplain Enhancement*

- In summer 2011, YTFP and FGS installed 16 constructed wood jams (CWJs) in East Fork Hunter Creek (Figures 2-4). Crews planted 710 native conifers within the project reach during winter 2011. In July 2012, YTFP and FGS installed two additional CWJs and completed project monitoring activities. Project objectives included immediately improving spawning and rearing habitat for salmonid populations and other native fish, and promoting the development and maintenance of complex and resilient stream and riparian habitats.

- In summer 2011, YTFP and FGS enhanced an existing engineered log jam (ELJ) in lower Terwer Creek and constructed an additional ELJ in the reach (Figures 5-8). The objective was to increase roughness elements in the project reach to reduce bank erosion and to help protect and maintain valuable slow velocity habitats (deep pools, side channels, off-channel ponds).

- Riparian Forest Restoration*

- YTFP continued operation of the Yurok Tribal Native Plant Nursery (YTNPN) at the Yurok Fisheries office in Klamath. The nursery and recently constructed 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. In winter 2011-2012, YTFP planted 710 native trees in East Fork Hunter Creek, 1,779 native trees and shrubs in Waukell Creek, 3,066 native trees in Den Creek (tributary to lower Terwer Creek), and 556 native trees in lower McGarvey Creek. Many of the trees and shrubs planted last winter were provided (grown and/or maintained) by the YTNPN.



Figure 3. Photographs looking upstream at a constructed wood jam in East Fork Hunter Creek prior to construction (Top – August 2011), following construction (Middle – November 2011), and during spring flows (Bottom – March 2012), Lower Klamath River (Photo Site: M-2).



Figure 4. Photographs looking upstream at a constructed bar apex jam in East Fork Hunter Creek prior to construction (Top – April 2012), during construction (Middle – July 2012), and following construction (Bottom – July 2012), Lower Klamath River (Photo Site: D).



Figure 5. An engineered log jam (ELJ1) in lower Terwer Creek following construction (Top – Fall 2009) and two years post-construction (Bottom – Fall 2011), Lower Klamath River.



Figure 6. Photographs of ELJ1 (initially constructed in 2009) prior to modification (a) and during modification in 2011 (b – d), Terwer Creek, Lower Klamath River (Photo date: 10/7/11).



Figure 7. Photographs of ELJ2 constructed during 2011 in Terwer Creek, Lower Klamath River (Photo dates: a) 10/6/11, b) 10/8/11, c) 10/8/11, d) 10/14/11, e) 3/29/12).



Figure 8. Photograph of ELJ1-ELJ2 during a relatively high flow event, Terwer Creek (3/29/12).

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 Green Diamond Resource Company (GDRC - local timber company/primary landowner), YTWRD, 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 2011, FGS worked with YTFP crews to harvest 231 whole trees from a GDRC timber harvest unit to use in 2011 and 2012 fisheries restoration projects in the Lower Klamath (Figure 9).



Figure 9. Whole tree materials being used to construct ELJ1-ELJ2, Terwer Creek (10/9/11).

- **Proposals Submitted**

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

California Department of Fish and Game (Fisheries Restoration Grant Program - FRGP):
Submitted in spring 2011

- Stream and Floodplain Enhancement of Lower McGarvey (Phase III) - \$89,308
(Secured Spring 2012)
- Terwer Creek Off-channel Habitat Restoration Feasibility Study - \$65,529
(Secured Spring 2012)
- Monitoring Natal and Non-natal Salmonids in McGarvey Creek - \$173,021
(Secured Spring 2012)

Submitted in spring 2012

- Enhancement of Lower Terwer Creek - \$13,060 **(Secured Spring 2012)**
- Instream and Off-Channel Restoration Designs for Lower Blue Creek - \$194,633
- Monitoring Natal and Non-natal Salmonids in McGarvey Creek - \$244,121

U.S. Bureau of Reclamation Native American Affairs Funding (NAAP):

- Water Quality Restoration and Planning for the Lower Klamath River Sub-basin - \$100,000 **(Secured Fall 2011)** & \$110,000 **(Secured Spring 2012)**

National Fish and Wildlife Foundation Funding:

- Lower Klamath Coho Enhancement Implementation and Monitoring - \$90,024
(Secured Spring 2012)
- Monitoring Coho Salmon Response to Habitat Restoration - \$27,413
(Secured Summer 2012)

Pacific Coastal Salmon Recovery Fund FY 2011:

- Klamath River Estuary Restoration Planning, Nursery Maintenance, and Riparian Planting - \$35,000 **(Secured Spring 2012)**

- **Meetings Attended**

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

YTFP and YTWDRD 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 YTWDRD 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 – California Licensed Geologist & Timber Operator) during the project period to plan ongoing and future restoration, assessment, and monitoring projects in the Lower Klamath River Sub-basin.

YTFP and YTWRD staff met regularly with the California Department of Fish and Game (CDFG), U.S. Bureau of Reclamation (BOR), National Oceanic and Atmospheric Administration (NOAA), and U.S. Fish and Wildlife Service (USFWS) during the project period to discuss ongoing and future restoration projects/proposals, and to conduct pre- and post-project reviews.

YTFP met several times with the Resighini Rancheria Tribal Council and Rob Cozens (Resighini EPA Director) to discuss their proposed KBR project and restoration in Waukell Creek.

YTFP worked closely with staff from the BOR, Karuk Tribe, Larry Lestelle, U.S. Geologic Survey, and CDFG to plan and implement the Klamath River Coho Salmon Ecology Study.

YTFP restoration staff continued participating in professional committees and programs such as the Peer Review Committee for CDFG's FRGP, the California Coho Salmon Recovery Team, the Pacific Marine and Estuary Fish Habitat Partnership, and the North Coast Integrated Resource Regional Water Management Plan.

YTFP met with NOAA to discuss our comments/recommendations to their recovery plan for Southern Oregon / Northern California Coast coho salmon and then provided NOAA with additional comments on the public draft of the recovery plan.

YTFP continued coordinating with YTEP as part of their Lower Klamath Wetland Program and to further develop restoration strategies for the Salt Creek watershed.

YTFP and FGS met with CDFG staff to discuss 2012 stream alteration agreements and potential strategies for obtaining these permits in a more timely manner in future years.

Sarah Beesley (YTFP-LKD) provided testimony to the California Assembly Joint Committee of Fisheries and Aquaculture at the State Capitol Building. The hearing was titled "Coho Salmon on the Brink: Understanding the Depth of the Crisis and Recovery Strategies". The background materials (agenda, documents, presenter links, news links and resource links) may be accessed via Assemblyman Wesley Chesbro's web site:

<http://www.asmdc.org/members/a01/hearing-coho-salmon-on-the-brink/item/2981-hearing-coho-salmon-on-the-brink>

YTFP-LKD lead staff led Assembly Member Wesley Chesbro and his staff person Tom Weseloh on a tour of the restoration work that we (YTFP-LKD & FGS) have been implementing in lower Terwer Creek. As the Chair of the Joint Committee on Fisheries and Aquaculture, Mr. Chesbro is very interested in recovery of California coho salmon.

FGS and YTFP led a field tour of lower Terwer Creek as part of the Salmonid Restoration Federation's Coho Salmon Confab. The objectives were to present an overview of the

enhancement efforts implemented in the watershed and to discuss use of the constructed off-channel wetlands by juvenile coho salmon and other native fish.

Sarah Beesley (YFTP-LKD) gave a formal presentation to the Trinity River Restoration Program and partners as part of their “Large Wood Informational Meeting”. The presentation focused on the wood loading projects being implemented in tributaries of the lower river.

Sarah Beesley (YFTP-LKD), FGS, and staff from the USFWS led a field tour of recently constructed off-channel habitats in Salt Creek, Panther Creek, Terwer Creek, and McGarvey Creek to geologist and fisheries staff of CDFG. The following day we toured similar sites located in Humboldt Bay watershed tributaries. Discussions focused on site selection, project design, construction, and monitoring. CDFG is developing criteria for off-channel habitat design and implementation to help guide and evaluate funding opportunities through the FRGP.

YTFP attended CDFG’s FRGP 2012 proposal solicitation notice (psn) workshop in Fortuna, and the 2012 psn workshop for the Klamath Coho Enhancement Fund in Yreka.

YTFP met with CDFG, BOR, USFWS, YTEP, and Rosie Clayburn (Yurok Cultural Dept.) on several occasions to discuss environmental and cultural compliance for 2011-2012 projects.

YTFP staff attended the 30th annual Salmonid Restoration Federation conference held in Davis during April 2012. YTFP coordinated with NOAA staff to present a poster that highlighted the fisheries data collected in two off-channel habitats enhanced in Terwer Creek during 2010.

Sarah Beesley (YFTP-LKD) began participating with the California Beaver Management Group and attended a meeting sponsored by the Occidental Arts and Ecology Center in winter 2012. Meeting attendees included beaver experts and other folks interested in developing new management strategies for beavers in California. Beavers provide vitally important functions such as creating high quality rearing habitat for juvenile salmonids. In addition, their ability to store water and recharge water tables is essential as California faces effects of climate change.

YTFP-LKD restoration staff and FGS coordinated with YTEP and other Tribal departments to host a group of college students interested in sustainable land management. The day included presentations from the various Tribal natural resource programs and field visits to the Klamath River overlook and to a restoration site in lower Terwer Creek. Discussions focused on Yurok culture and long-term, sustainable resource management and habitat restoration.

YTFP staff led a tour of the Yurok Tribal Native Plant Nursery for staff from the U.S. Department of Agriculture and Beijing Forestry University.

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

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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.

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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.

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.

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