

## Western Native Trout Initiative

### Final Progress Report for 2012-2014

#### Little Kern Golden Trout Population Assessment and Post-fire Monitoring/Habitat Assessment Project

Recipient: Trout Unlimited, California Council

Agreement Number: F12AP00665

December 22, 2014

During the summer of 2011 the Lion Fire burned more than 20,000 acres within the drainage of the Little Kern River in the Sequoia National Forest. The Little Kern River is located at the southern end of the Sierra Nevada mountain range in the Golden Trout Wilderness (Figure 1). The Lion Fire burned intensely in an area that supports the Willow/Sheep lineage of Little Kern golden trout (LKGT), one of four remaining ancestral lineages of this native trout that is listed as Threatened under the Endangered Species Act. The location and intensity of the fire raised concerns of resource managers for this important LKGT lineage. An initial post-fire survey conducted in October, 2011, found extensive sedimentation, evidence of fish kills, other fire impacts and a paucity of live fish observed within the Willow and Sheep Creek area.

Concerned partners (Table 1) developed a post-fire assessment project and applied for 2012 WNTI funding to accomplish the following objectives:

1. Conduct assessments for LKGT population density and structure, genetics status, and post-Lion Fire habitat effects. These assessments to be conducted collaboratively with participating agencies, NGO's and academic partners.
2. Evaluate effectiveness of fish migration barriers, including reduced effectiveness due to post-fire sedimentation or damage and develop/pursue possible mitigation measures if needed.
3. Develop plans for refuge populations of the stocks (lineages) at highest risk if warranted; implement refuge actions if feasible.
4. Develop population and habitat/barrier status information that will be key to recovery plan revision.

Based on the conditions observed in the fall of 2011 there was significant concern that further sedimentation and other post-fire impacts during 2012 spring run-off could jeopardize survival of the Willow/Sheep lineage of LKGT. Contingencies for rescuing at-risk Willow/Sheep LKGT and possible refuge establishment were developed.

Subsequently, surveys conducted in August, 2012 determined that the Willow/Sheep lineage had survived these impacts of the Lion Fire. Direct observation surveys

determined presence of multiple size/age classes, including young-of-the-year. Delineation of LKGT distribution in Willow, Sheep, No Name, Tamarack and Lion Creeks was then determined. Fish migration barriers that protect these populations from downstream hybridized trout had remained intact and functioning.

With the urgency of concern for possible rescue and refuge efforts for LKGT relieved by status determined in the summer of 2012, the focus of the project shifted to assessing the status of LKGT and habitat throughout the Little Kern basin. A comprehensive population assessment for LKGT has not been available previously and managers have expressed the value of having a scientifically-supported status assessment for developing and planning future recovery efforts. Past efforts at population assessment were largely visual estimates, angling, or single-pass or ad hoc electrofishing surveys.

For this status assessment, the goal is to survey ten percent of the watershed using a stratified random sampling design. Baseline fisheries data are gathered including species distribution, size-class structure and abundance. Population estimates, using depletion electrofishing and a maximum likelihood removal estimator are conducted at randomly selected sites for each tributary in the basin (Figure 2). Fish distribution may also be determined through direct observation and/or single pass electrofishing surveys.

Stream mapping includes location and assessment of fish migration barriers. Habitat conditions are also measured. Presence/absence visual surveys for mountain yellow-legged frogs are included. Genetic samples for LKGT populations are being collected throughout the Little Kern basin and through the 2014 field season 604 samples have been collected. A Genetics Management Plan for LKGT has been prepared by University of California, Davis, Genomics Variation Laboratory, completed in 2014.

After surveys during the 2013 field season about 40 percent of the tributaries had been sampled by electrofishing with most of the effort concentrated in the tributaries and the main stem Little Kern in the lower half of the basin. These surveys are located within the Golden Trout Wilderness and WNTI project funds have been used to secure pack stock services to transport necessary gear and supplies in and out of the wilderness. Forest Service funding was also applied for pack trips. Additionally, WNTI funds were used to acquire additional electrofisher batteries and field gear.

Seven field trips were conducted during 2014 season to continue the status assessment for the Little Kern watershed. After these surveys about 85 percent of the basin's tributaries had been surveyed by electrofishing (Figure 3). Along with surveys on the main stem Little Kern, surveys were conducted on Clicks Creek, North Fork Clicks Creek, Mountaineer Creek, South Mountaineer Creek, Jacobsen Creek, Pecks Canyon Creek and two of its unnamed tributaries, Trout Meadow Creek, Deep Creek, and Soda

Spring Creek. The three Maggie Lakes were sampled by gill netting and 30 genetic samples were collected.

During 2014, nearly 2,000 LKGT were captured during electrofishing surveys; 160 scale samples and 312 genetic samples were collected. Fish population estimates were conducted for 25 stream segments on 10 tributary streams. Reconnaissance surveys were conducted on tributaries on the northwest side of the basin. East side tributaries Tamarack, Willow, No Name, Sheep and Lion Creeks, for which surveys were completed in 2013, were revisited in 2014 to monitor drought-affected habitat conditions.

The remaining WNTI project funds were spent and the grant has closed at the end of 2014. However, the basin wide status assessment is not fully complete. The California Department of Fish and Wildlife is planning surveys to complete the assessment in the 2015 field season.

Table 1. WNTI Little Kern Golden Trout Assessment and Post-Lion Fire Assessment Project Partners.

Partner/Agency	Lead Participants/Contacts
California Department of Fish and Wildlife	D. Lentz, S. Hogan (Mehalick)
Sequoia National Forest	N. Hemphill, R. Galloway
Trout Unlimited, California Council	D. Irby, H. Kern
California Trout	M. Drew
U. C. Davis Genomics Variation Lab	M. Stephens, B. May

Progress report by: D. Lentz, CDFW

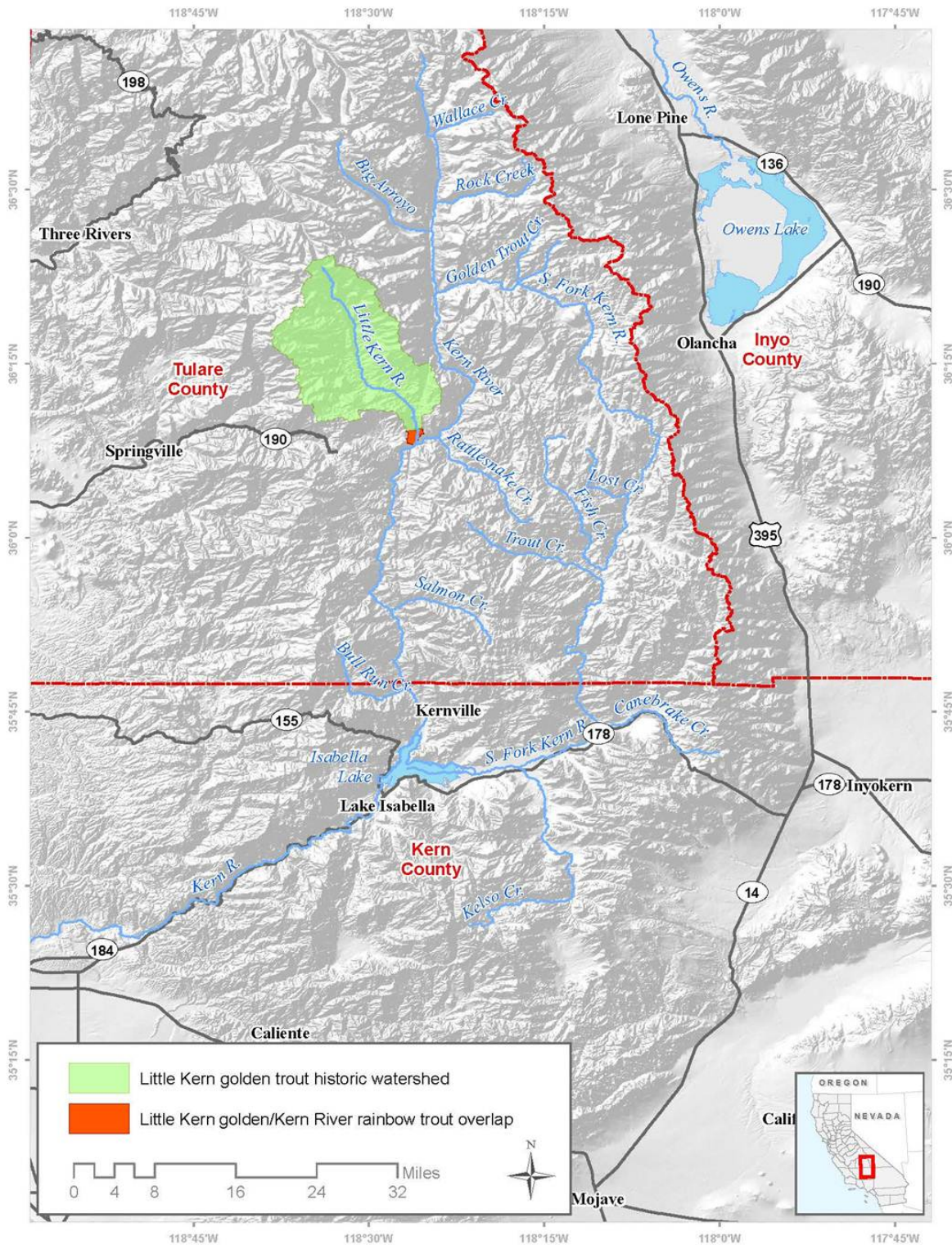


Figure 1. Little Kern River watershed within the Kern River basin, southern Sierra Nevada, California

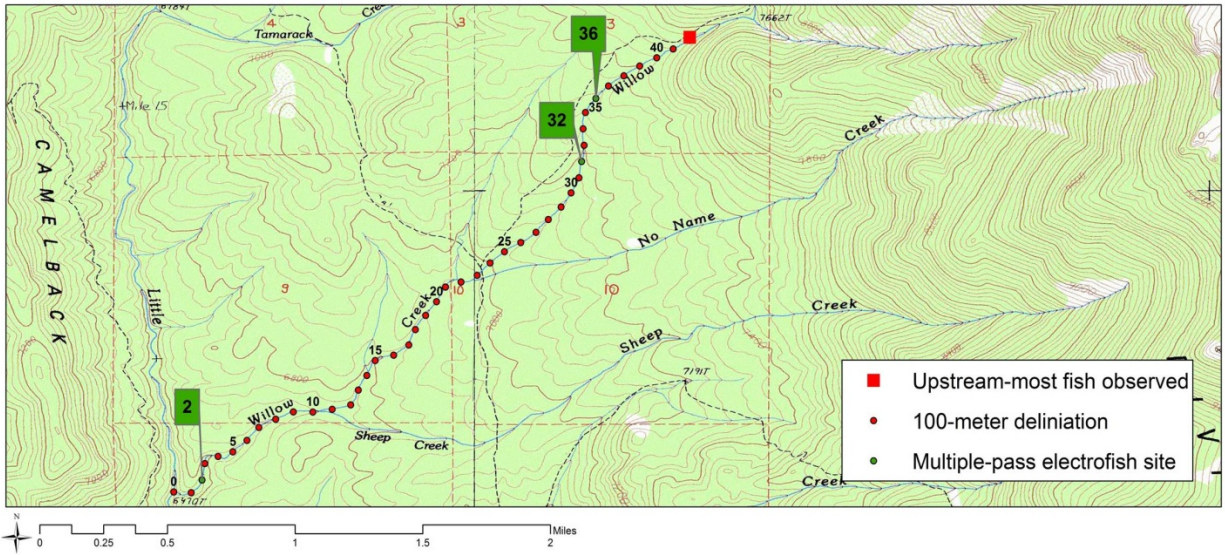


Figure 2. Map of stratified random sampling design, 100m delineations, Willow Creek



Little Kern golden trout

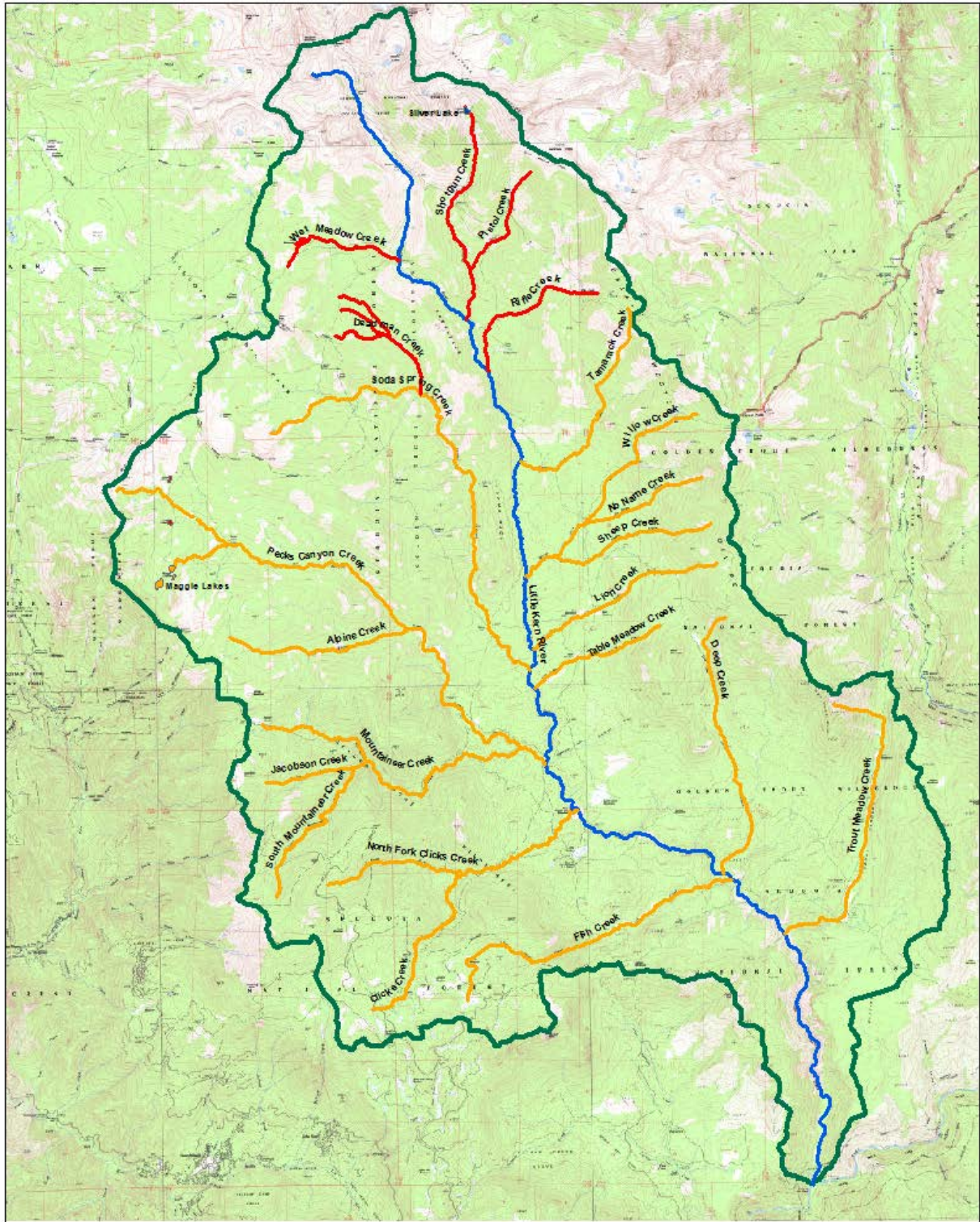


Figure 3. Little Kern River watershed showing stream survey progress through 2014.



Alpine Creek





Little Kern golden trout



Maggie Lakes, Pecks Canyon Creek drainage





2011 Lion Fire, Little Kern River drainage. Photos from August, 2012.



2013 Lion Creek electrofishing and LKGT genetic sampling





Little Kern golden trout



Barrier Assessment