

**Heenan Creek 2012 summary report**  
***June 6-8; October 30; and November 1, 2012***

**State of California**  
**Department of Fish and Wildlife**  
**Heritage and Wild Trout Program**



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## Introduction

The California Department of Fish and Wildlife (CDFW) Heenan Lake Wildlife Area is southeast of Markleeville, CA (Alpine County; Figure 1) and contains Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*), a federally-listed species (threatened) under the Endangered Species Act of 1973 (16 USC § 1531 et seq.). Heenan Lake was designated by the California Fish and Game Commission as a Wild Trout Water in 1983 and was further designated as a Heritage Trout Water in 1999 for the population of lake-form Lahontan cutthroat trout within their native drainage. Wild Trout Waters are those that support a self-sustaining wild trout fishery, are aesthetically pleasing and environmentally productive, provide adequate catch rates in terms of numbers, size, or species of trout, and are open to public angling (Bloom and Weaver 2008). Wild Trout Waters may not be stocked with catchable-sized hatchery trout. Heritage Trout Waters are a sub-set of Wild Trout Waters that highlight wild populations of California's native trout within their historic drainages.

Heenan Lake contains two strains of Lahontan cutthroat trout. One strain, originally from Independence Lake, near Truckee, CA, is believed to be of pure genetic stock (Independence-strain); these fish are marked with an adipose fin clip and are an important brood-stock source used to support hatchery stocking efforts throughout California. The second strain was translocated into Heenan Lake in 1935 (Somer 2009) and is hybridized with rainbow trout (*Oncorhynchus mykiss*) of unknown origin (Heenan Lake-strain). These fish are identified by the presence of an adipose fin and are not used in brood-stock management. Naturally spawning Independence Lake-strain Lahontan cutthroat trout may also have an intact adipose fin; however, no trout with an adipose fin is used in brood-stock management. A fish weir is in place near the mouth of Heenan Creek and a ladder structure directs adult spawners into raceways constructed by the CDFW for the purpose of spawning Independence-strain Lahontan cutthroat trout on an annual basis.

Hybridized Heenan Lake-strain Lahontan cutthroat trout are present in Heenan Creek and a goal of the Heenan Lake Fishery Management Plan (Somer 2008) is to remove these fish from Heenan Creek to avoid potential hybridization with Independence-strain brood stock. This population of introgressed fish poses an ongoing threat to the genetic integrity of Independence-strain Lahontan cutthroat trout in Heenan Lake. It is possible for these hybridized fish to move downstream from Heenan Creek into the lake and spawn with lake-dwelling fish in the inlet below the fish weir. Although these offspring would have an intact adipose fin and, therefore, would not be spawned in subsequent years, the continual influx of rainbow trout alleles into the lake population should be minimized and, if possible, eliminated.

The CDFW Heritage and Wild Trout Program (HWTP) has conducted manual removal of fish in Heenan Creek since 2008 (Weaver and Mehalick 2008, 2009, 2010; Hogan and Weaver 2011). In an ongoing effort to continue to eradicate the

stream population, the HWTP continued Heenan Creek fish removal efforts in 2012 using backpack electrofishers. This report summarizes the results of this removal effort.

## **Methods**

Manual removal was conducted on June 6<sup>th</sup>-8<sup>th</sup>; October 30<sup>th</sup>; and November 1<sup>st</sup>, 2012 using Smith Root backpack electroshockers. All captured fish were measured to the nearest inch (total length) using a calibrated landing net and were euthanized and dispatched (buried or dispersed in dense vegetation). In 2008, Heenan Creek was subdivided into four sections from the fish weir upstream approximately one mile (Sections 1-4) for the purpose of monitoring removal success and associated fish densities in discrete portions of the drainage (Figure 2). Efforts in 2012 were focused in Sections 1 and 2. In all areas of the creek where gravel was observed, HWTP surveyors actively trampled the streambed in an attempt to dislodge eggs and limit recruitment.

## **Results**

The 2012 removal captured two stream-resident trout, both of which were six inches in total length. The capture locations were approximately 0.3 miles apart (Figure 3). Zero young-of-year were either observed or captured, indicating that spawning and/or recruitment was limited or did not occur in 2012. Since 2008, there has been a large reduction in the number of fish captured in each subsequent year (Figure).

## **Discussion**

Heenan Creek fish removal has been ongoing since 2008 and has required substantial time and resources, including manual thinning of extensive thickets of willows to allow physical access to large portions of the stream channel. The marked reduction in the number of trout captured each year since project implementation, coupled with only two fish captured in 2012, indicate manual removal efforts were successful at reducing the number of introgressed trout in Heenan Creek, potentially limiting the influx of rainbow trout alleles into the lake population. Young-of-year were neither observed nor captured in both 2011 and 2012 and may indicate that recruitment in Heenan Creek was either limited or did not occur in either year. It is presumed that the spawning cycle has been disrupted.

In 2010, structural damage to the fish weir occurred, allowing passage of lake-form Lahontan cutthroat trout into Heenan Creek (Weaver and Mehalick 2010). The HWTP captured and relocated these fish back into Heenan Lake and repairs were made to the fish weir to prevent further passage. The HWTP continues to annually monitor the efficacy of the fish weir as a barrier, particularly during high spring flows. In 2012, no larger-sized fish were observed nor captured in Heenan

Creek and, presumably, the fish weir was properly functioning as a barrier to upstream fish migration.

## **Conclusion**

The HWTP has conducted manual removal efforts in Heenan Creek for five consecutive years; the results show a strong downward trend in the number of fish captured in each subsequent year which indicates successful reduction of the population to near zero. It is likely that reproduction and/or recruitment of the stream population did not occur in either 2011 or 2012 and few fish appear to remain in the system. The HWTP recommends continued removal efforts in 2013. Removal efforts will be deemed successful when zero trout are captured over a consecutive three year period. In order to maximize the chances of halting a spawning event in 2013, it is recommended that a removal effort be conducted as early as possible in the spring before spawning occurs. However, due to high elevation, possibility of snow, and corresponding road closures in the area, access may be limited during the ideal timeframe (April to May).

In addition, it is of value to better understand the proportion of hybridized fish found within the lake population. As outlined in the Heenan Lake Fishery Management Plan (Somer 2008), long-term project success will be accomplished with the removal of all hybridized fish (in both Heenan Creek and Heenan Lake) and removal of the fish weir to allow fish passage and natural spawning of Independence-strain Lahontan cutthroat trout in Heenan Creek. Due to the presence of hybridized fish in the lake, these objectives will likely not be met until a chemical treatment is performed. Manual removal efforts in Heenan Creek have been successful at limiting the population and should continue to occur until the creek is deemed fishless. In addition, the HWTP recommends monitoring the proportion of Heenan Lake-strain fish observed during the annual spring spawning event and continue to remove these from the population.

## **References**

Bloom, R., and J. Weaver. 2008. The California Heritage and Wild Trout Program Handbook (Draft). State of California Resources Agency. Department of Fish and Game. Heritage and Wild Trout Program.

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Weaver, J. and S. Mehalick. 2008. Heenan Creek 2008 Summary Report. State of California. Resources Agency. Department of Fish and Game. Heritage and Wild Trout Program. Rancho Cordova, CA.

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Figure 1. Vicinity map of Heenan Lake Wildlife Area including Heenan Lake and Heenan Creek

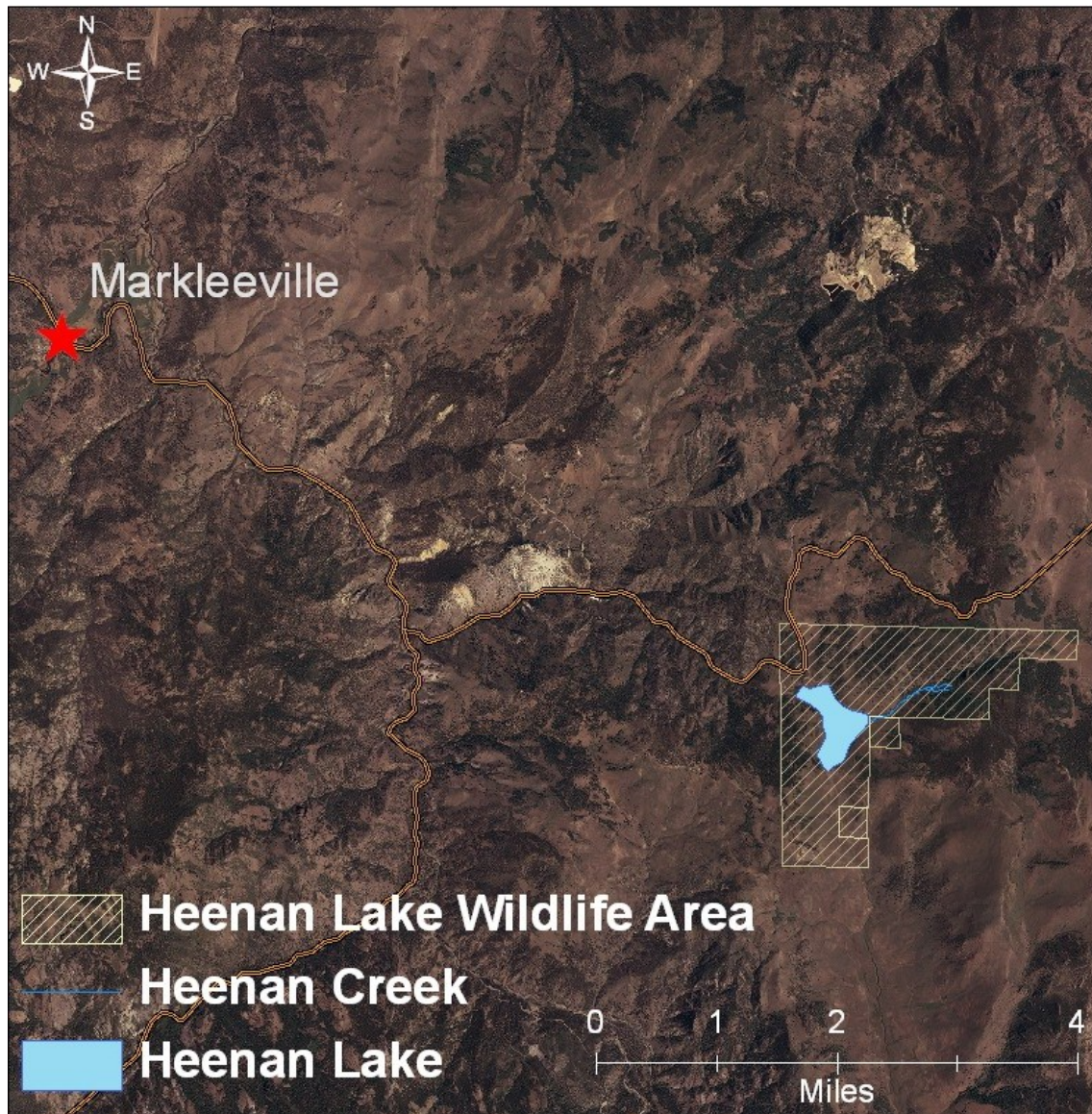




Figure 2. Map of Heenan Creek section locations

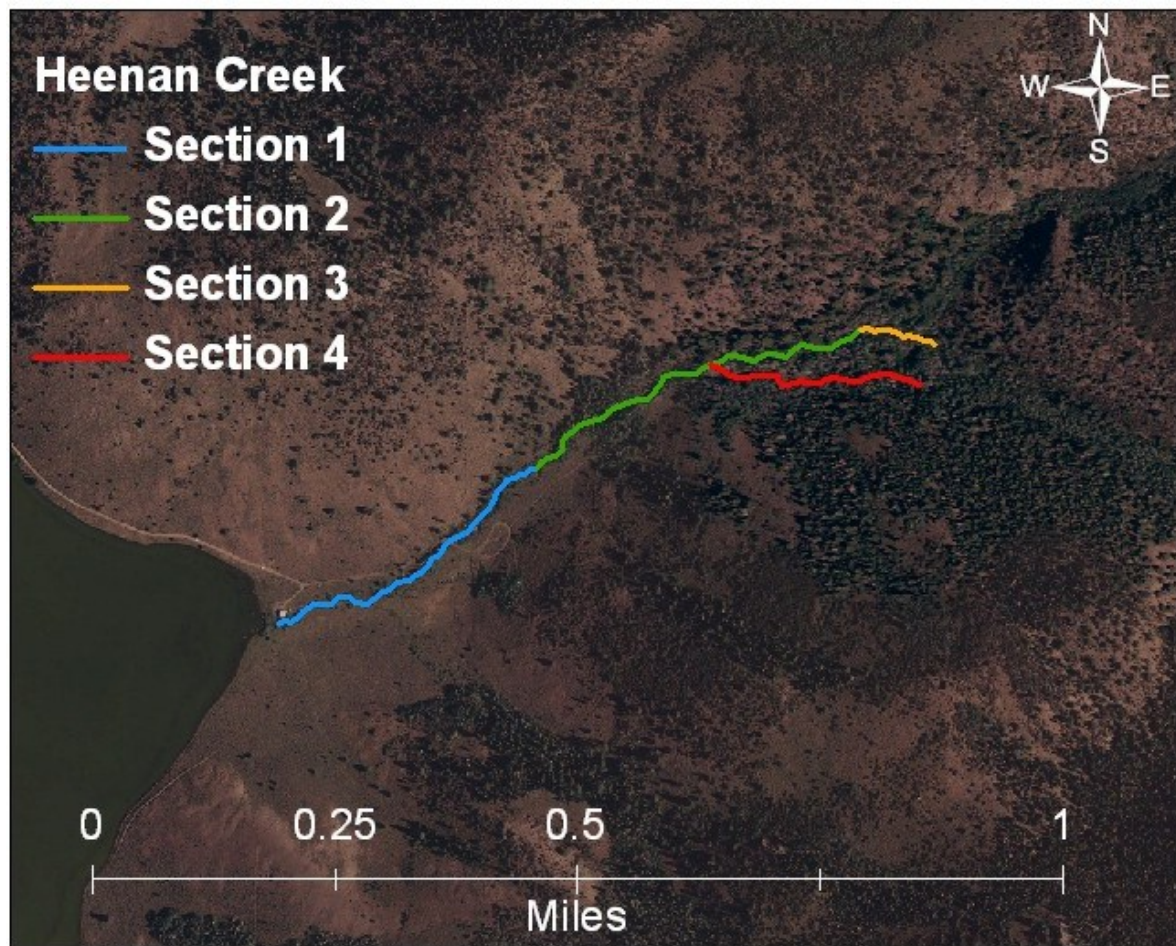




Figure 3. Detail map of 2012 trout capture locations in Heenan Creek

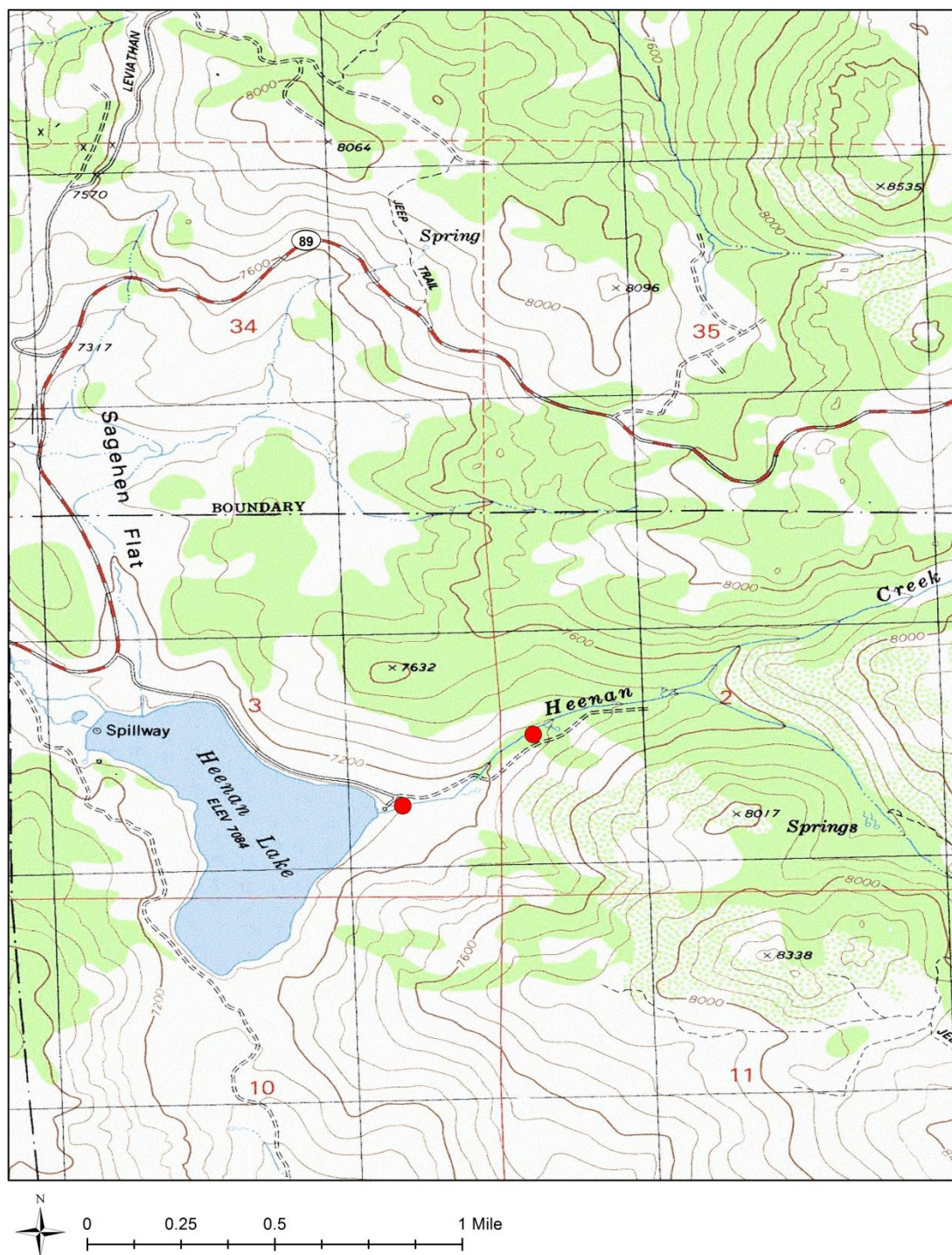




Figure 4. Length frequency histogram of stream-resident fish captured in Heenan Creek (2008-2012)

