

Heenan Creek 2013 summary report

June 6-7 and August 5, 19 and 20, 2013

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*), which are listed as threatened under the Federal 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 2009) 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) conducted manual fish removal in Heenan Creek since 2008 (Weaver et al. 2008-2010 and Hogan et al. 2012). The ongoing effort to eradicate the stream population was continued in

2013 by the HWTP using backpack electrofishers. This report summarizes the results of this survey effort.

Methods

Manual removal efforts were conducted on June 6th and 7th and August, 5th, 19th and 20th, 2013 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 efforts and fish densities in discrete portions of the drainage (Figure 2). Efforts in 2013 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 effort to dislodge eggs and limit recruitment.

Results

Two trout were captured during the 2013 removal effort; one on June 6th (nine inches total length) and the other on August 19th (11 inches). Both were captured approximately 0.4 miles upstream of the weir in Heenan Creek (Figure 3). Zero young-of-year were observed or captured. Since 2008, there has been a large reduction in the number of fish captured in each subsequent year (Figure 4).

Discussion

Manual fish removal in Heenan Creek has required considerable time and effort. However, the reduction in the number of trout captured each year since project implementation, coupled with only two fish captured in 2013 indicate that manual removal efforts have successfully reduced the number of introgressed trout in Heenan Creek, potentially limiting the influx of rainbow trout alleles into the lake population. Young-of-year have neither been observed nor captured since 2011, which indicates recruitment in Heenan Creek was either limited or did not occur in those years. It is presumed the spawning cycle has been disrupted as a result of this ongoing project.

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. It is unclear whether the two larger-sized trout captured in 2013 evaded capture during previous removal efforts or came from the lake population (including the possibility of being small enough to ascend past the fish weir).

Conclusion

The HWTP has conducted manual removal efforts in Heenan Creek for six consecutive years; the results show a strong downward trend in the number of fish captured in each subsequent year which indicates successful capture of fish. The HWTP recommends continued removal efforts until zero trout are captured over a consecutive three year period.

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 2009), 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

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

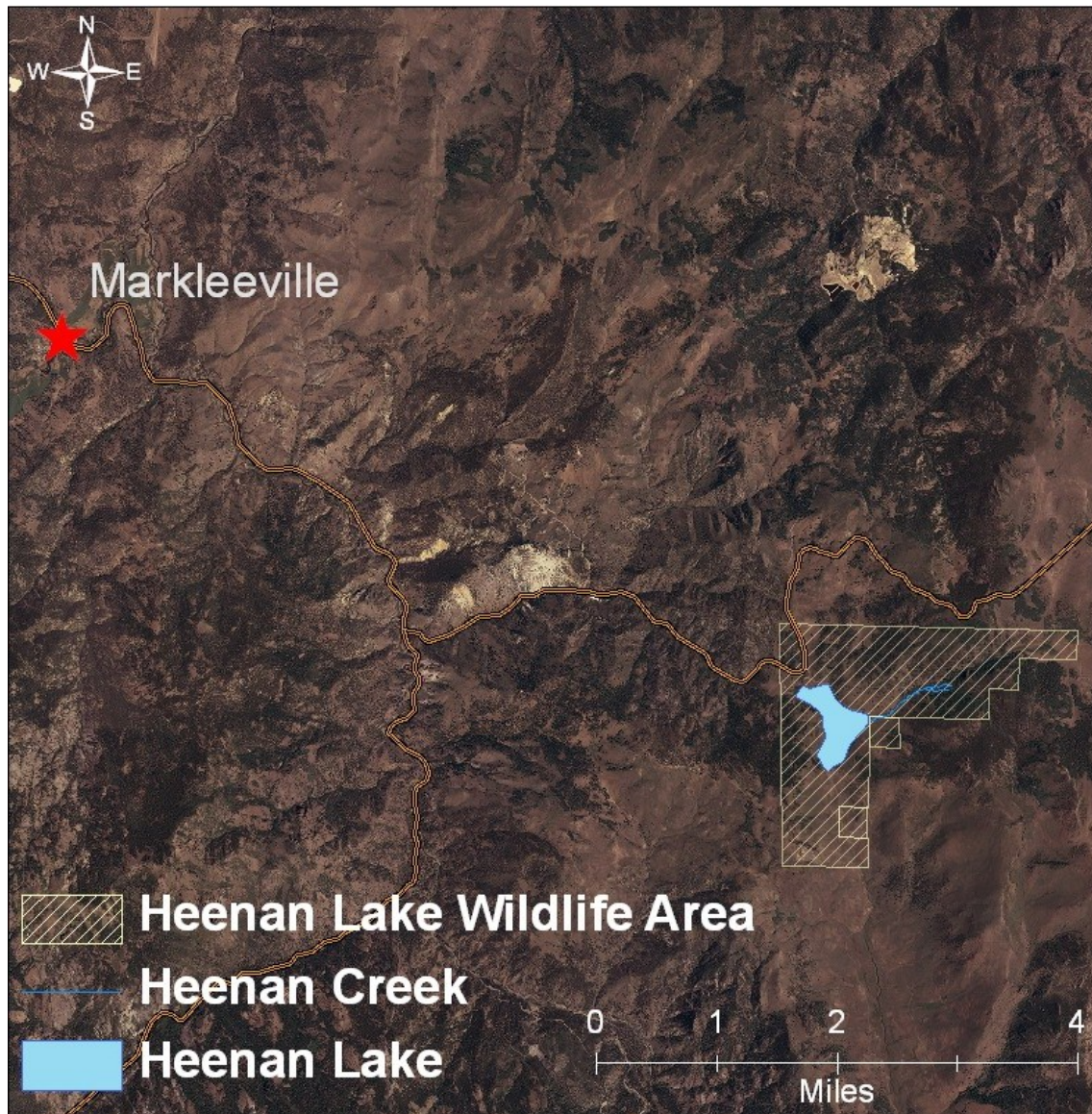


Figure 2. Map of Heenan Creek section locations

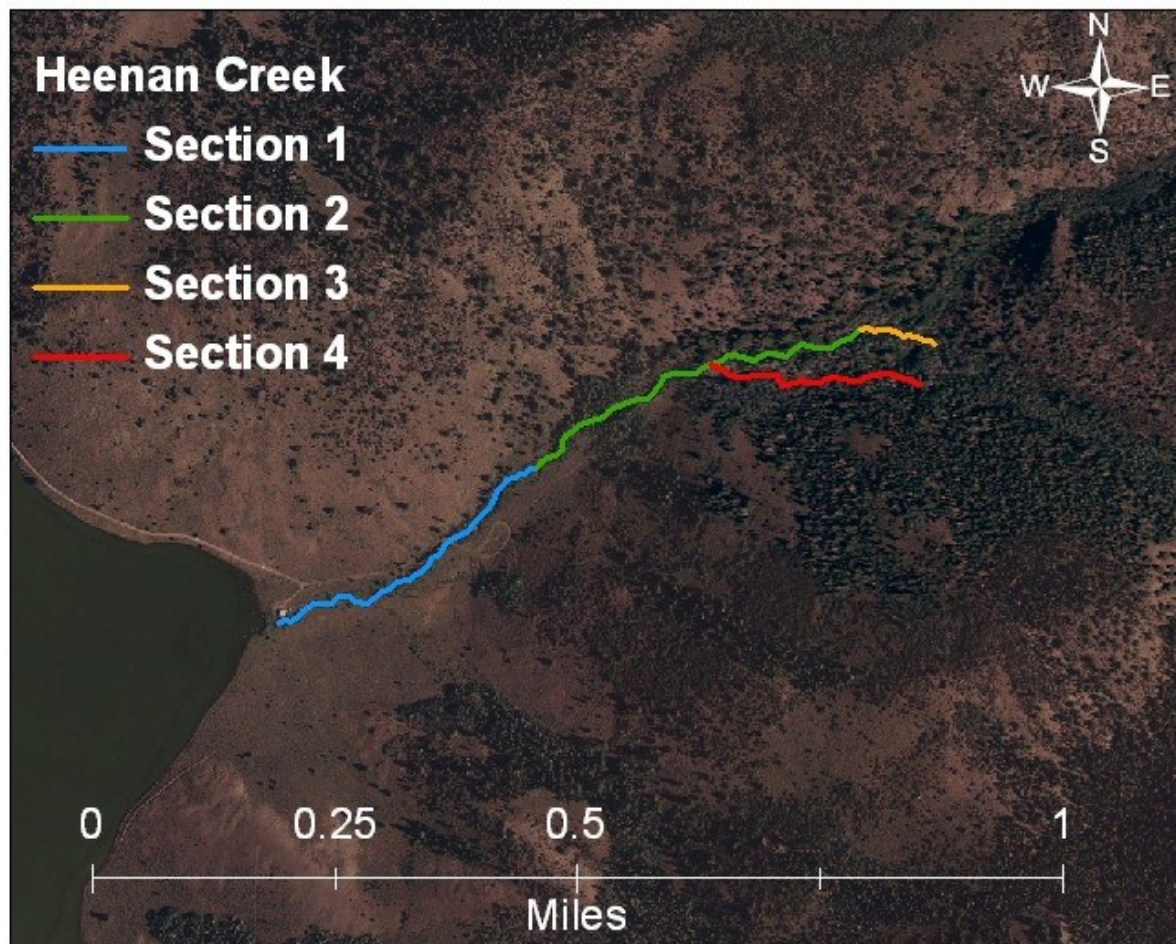


Figure 3. Detail map of 2013 trout captured location in Heenan Creek

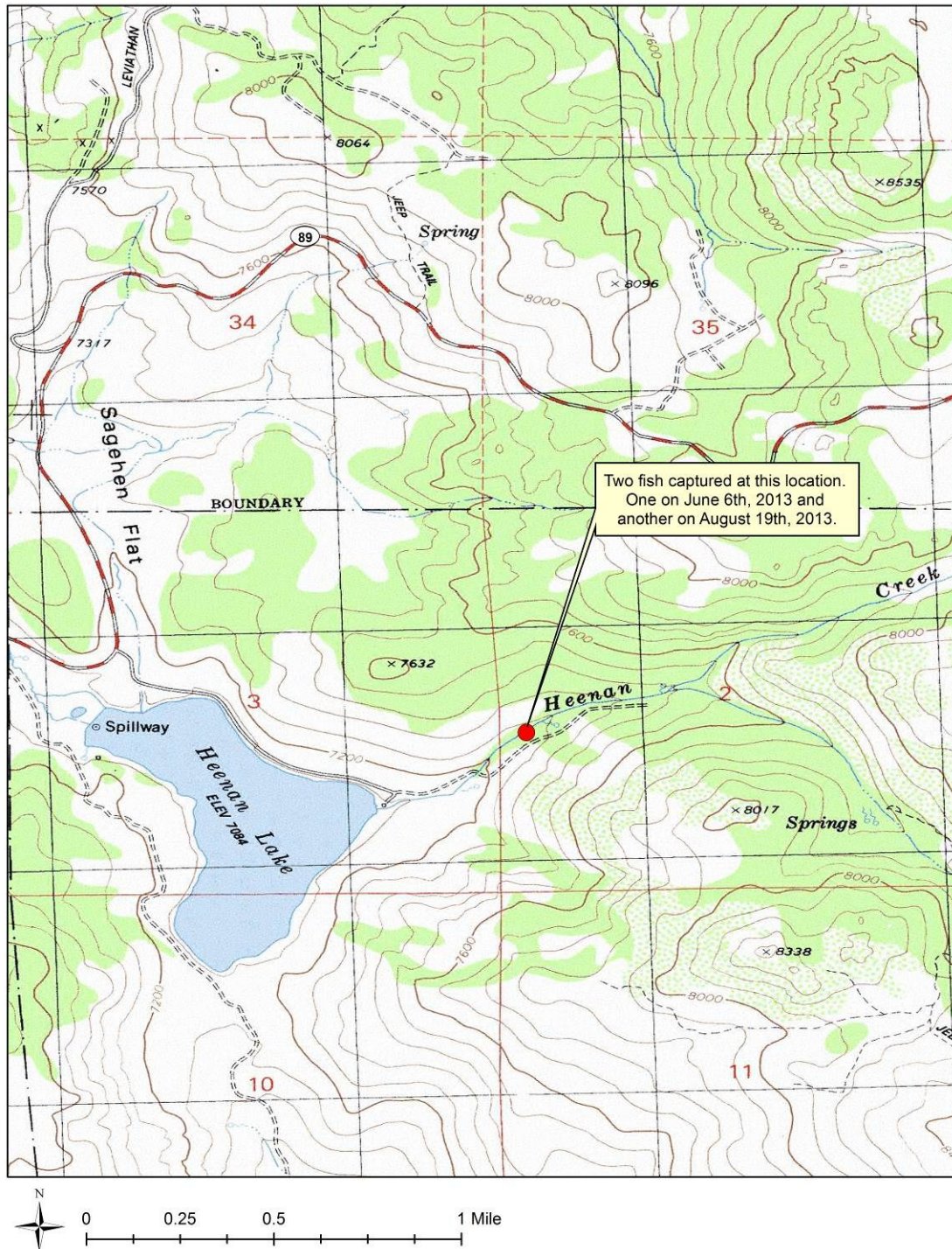


Figure 4. Length frequency histogram of stream-resident fish captured in Heenan Creek 2008-2013

