

Independence Creek 2012 summary report

June 14, 2012

State of California

Department of Fish and Wildlife

Heritage and Wild Trout Program



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Introduction

Independence Lake (Nevada County) is located approximately 11 miles to the northwest of Truckee, CA and is within the Truckee River basin. Independence Lake contains a self-sustaining wild population of lake-form Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*) within its native range. Lahontan cutthroat trout are a Federally-listed species (threatened) under the Endangered Species Act of 1973 (16 USC § 1531 et seq.). Independence Lake is a natural lake which has been dammed to increase water storage capacity and provide water to the State of Nevada. The fish assemblage in the lake includes a variety of species, both native and non-native.

The upper portion of Independence Creek, a perennial tributary flowing into Independence Lake, provides spawning and rearing habitat for trout in the lake, including both Lahontan cutthroat and non-native brook trout (*Salvelinus fontinalis*). The population of Lahontan cutthroat trout in this system is believed to be of pure genetic stock and has been used by the California Department of Fish and Wildlife (CDFW) to develop a brood-stock population that supports stocking of Lahontan cutthroat trout throughout the Sierra Nevada Mountains (Somer 2008). This area is also the site of a restoration project to protect and conserve Lahontan cutthroat trout through a joint effort by multiple agencies, including the US Geological Survey (USGS), US Forest Service (USFS), The Nature Conservancy (TNC) and CDFW.

Non-native trout are also present in lower Independence Creek, from Independence Lake downstream to the confluence with the Little Truckee River. In 2011, the CDFW and TNC constructed barriers to upstream fish migration on both the dam and spillway channel to prevent an influx of non-native trout into the lake.

The lower portion of Independence Creek (Sierra County) flows for approximately five miles (Figure 1) and was surveyed at four locations by the HWTP in 2012. Single-pass electrofishing was utilized in order to gather data on fish distribution, species composition, relative abundance and to assess potential threats from non-native trout to Lahontan cutthroat trout in Independence Lake.

Methods

Single-pass electrofishing surveys were conducted at three locations in the lower portion of Independence Creek (Sections 112, 212, and 412) and at one location in an unnamed tributary to Independence Creek (Section 312) on June 14th, 2012 (Figure 2). Main-stem section locations spanned from the confluence with the Little Truckee River upstream approximately three miles. Section 312 was located approximately 0.2 miles upstream of the confluence with Independence Creek. Survey locations were selected based on access points and specific section boundaries were determined by distinct breaks in habitat type and/or stream gradient.

Surveys were conducted using Smith Root backpack electrofishers. In each section, one shocker and multiple netters targeted shallow-water habitat with water depths conducive to backpack electrofishing. Surveyors captured fish opportunistically at accessible locations in each section and did not attempt to collect all fish within a given section. Prior to electrofishing, physical measurements of the stream and environmental conditions were taken, including air and water temperature (°C) and conductivity (specific and ambient in microsiemens). These factors were used to determine appropriate electrofisher settings. Representative photographs were taken and coordinates were recorded for the section boundaries using Global Positioning System hand-held units (North American Datum 1983). Surveys proceeded in an upstream direction, with netters capturing fish and placing them in five-gallon buckets to be held until processed. All captured fish were identified to species, trout were measured to the nearest inch using a calibrated landing net (total length) and all fish were returned live to the creek. Non-salmonids were tallied by species.

Results

The portion of Independence Creek downstream from Independence Lake consisted mainly of flatwater habitat (pocket water) with substrate dominated by cobble and gravel. Mean water and air temperature were 19 and 20 °C, respectively (measured twice during the survey effort).

A total of 23 rainbow trout (*Oncorhynchus mykiss*), 11 brook trout, 46 brown trout (*Salmo trutta*) and 98 sculpin (*Cottus* sp.) were captured among all four sections (Figure 3 and Table 1). Based on species distribution, the sculpin were likely Paiute sculpin (*Cottus beldingi*) but were not identified to species. Captured trout ranged from one to ten inches in total length. The majority of brook trout were captured in the unnamed tributary to Independence Creek (Section 312); only one brook trout was captured in the main-stem (Section 212). Rainbow and brown trouts were captured in all sections and brown trout were the primary species captured in the main-stem Independence Creek.

Discussion

During the survey, three species of non-native trout were captured along with one native non-game species. Zero Lahontan cutthroat trout were captured; however, the surveys were limited in geographic scope and did not include all habitat throughout the lower reach of Independence Creek and tributaries. Multiple size classes were observed and, based on outward appearance, all captured trout appeared to be of wild origin (based on fin condition). Previous surveys indicate this portion of Independence Creek was dominated by brown trout, posing little genetic risk to the lake-form Lahontan cutthroat trout population. Rainbow trout, on the other hand, are able to hybridize with Lahontan cutthroat trout.

Conclusion

The HWTP is dedicated to protecting and enhancing the Lahontan cutthroat trout population in Independence Lake and will continue to monitor the efficacy of the fish barrier and non-native species distribution. If resources allow, the HWTP recommends more comprehensive surveys in lower Independence Creek and tributaries, including habitat and barrier assessments to determine whether portions of this watershed would meet criteria for restoration of Lahontan cutthroat trout.

The HWTP will continue to collaborate with and provide support to the USGS, USFS, TNC and other entities in a commitment to protect and conserve this heritage trout resource.

References

Somer, W. 2008. Heenan Lake Fishery Management Plan. State of California. Resources Agency. Department of Fish and Game. North Central Region. Rancho Cordova, CA.

Figure 1. Vicinity map of 2012 Independence Creek survey locations

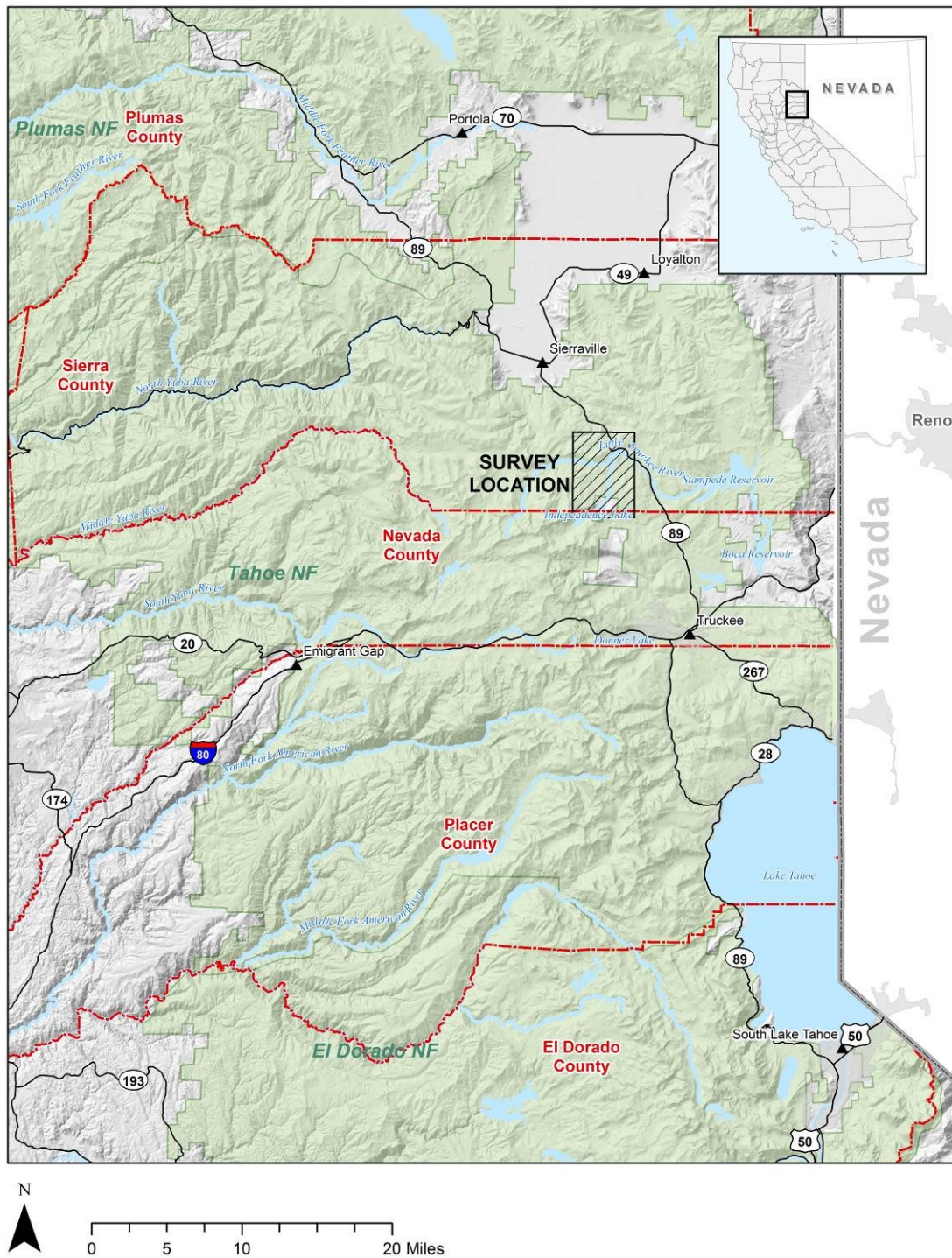


Figure 2. Detail map of 2012 Independence Creek single-pass electrofishing section locations



Figure 3. Graph of 2012 Independence Creek and unnamed tributary single-pass electrofishing data: captured trout length frequency

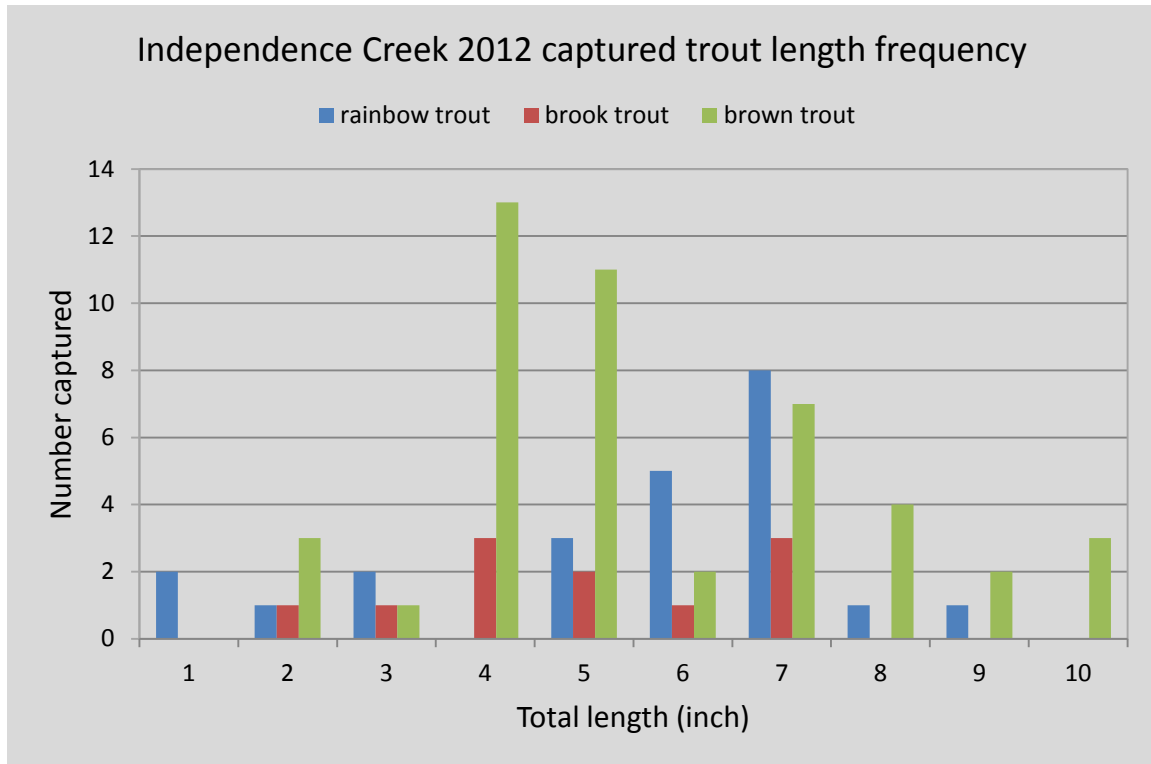


Table 1. Number of fish captured by species and section in Independence Creek and unnamed tributary in 2012

Section	Species	Total fish captured
112	rainbow trout	6
	brown trout	8
	sculpin	35
212	rainbow trout	8
	brook trout	1
	brown trout	14
	sculpin	33
312	rainbow trout	7
	brook trout	10
	brown trout	6
412	rainbow trout	2
	brown trout	18
	sculpin	30