Trout Creek 2013 summary report

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State of California

Department of Fish and Wildlife

Heritage and Wild Trout Program

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Introduction

Trout Creek, tributary to Edson Creek (Siskiyou County), is located approximately 15 miles northeast of McCloud, CA within the McCloud River basin (Figure 1). Trout Creek contains a self-sustaining wild population of McCloud River redband trout (*Oncorhynchus mykiss stonei;* MRRT) within its native range. MRRT are native to the upper McCloud River and tributaries above Middle Falls and are designated as both a U.S. Forest Service (USFS) Sensitive Species and California State Species of Special Concern (Moyle et al. 1995). In 1994, MRRT were listed as a Category 1 species under the Endangered Species Act of 1973 due to concerns regarding introgression with hatchery fish, habitat reduction during an extended drought and potential hydropower development (Federal Register, Vol. 219, Nov. 15, 1994, page 58982). A subsequent Conservation Agreement for MRRT was signed by federal, state and private entities in 1998. This agreement identified threats to the persistence of MRRT, defined conservation actions to be taken to prevent listing (including the delineation of a refugium area and development of a watershed improvement plan) and developed a monitoring strategy for grazing and timber practices (USFS 1998). In 1999, due to the implementation of the conservation agreement, MRRT were removed from the Candidate list (Federal Register, Vol. 65, October 20, 2000, page 63044). Brown trout (*Salmo trutta*) were recently documented in Trout Creek and, if present in the system, may impact the MRRT population through predation and/or competition.

In 2013, the California Department of Fish and Wildlife Heritage and Wild Trout Program (HWTP) conducted single-pass electrofish surveys in Trout Creek to determine the presence or absence and potential distribution of brown trout.

Methods

Single-pass electrofish surveys were conducted at two locations in Trout Creek (Sections 113-213) on October 22nd and 23rd, 2013 (Figures 2-3). Surveys were conducted using Smith Root backpack electrofishers. In each section, one shocker and one netter targeted habitat with water depths conducive to backpack electroshocking. HWTP personnel captured fish opportunistically at accessible locations in each section. Prior to electrofishing, physical measurements of the stream and environmental conditions were taken, including air and water temperature (ºC) and conductivity (specific and ambient in microsiemens). These factors were used to determine appropriate electrofisher settings. 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 processing. All captured fish were identified to species and trout were measured to the nearest inch using a calibrated landing net (total length). Tissues for genetic analyses were acquired from a subsample of MRRT captured in both sections and a representative photo was taken of each trout sampled. Any observed dry stream segments were documented and geo-referenced.

Upstream distribution of fish was determined and barriers to upstream fish migration were documented. Brown trout captured during the survey effort were euthanized and dispatched (buried or dispersed in dense vegetation).

Results

In Section 113, 40 brown trout and 155 MRRT were captured; of the latter 15 were sampled for genetic tissue (Figure 4). In Section 213, zero brown trout and 63 MRRT were captured; surveyors collected 22 genetic tissue samples from a subset of the captured MRRT (Figure 4). Captured brown trout ranged from two to ten inches in total length with an average of 3.6 inches (Figure 5). Captured MRRT ranged from one to nine inches in total length with an average of 3.9 inches (Figure 6). Mean water and air temperature were 3 and 11.5 ºC, respectively. Two first-order tributaries form the headwaters of Trout Creek. On the South Branch, upstream MRRT distribution was determined to be approximately one tenth of mile upstream of the confluence with the North Branch (Figures 2-3). Farther upstream, flow was extremely low and habitat was likely the limiting factor to fish presence. No water was observed in the North Branch. No permanent barriers to fish passage were identified; however, a few small log jams that were likely seasonal low-flow barriers were observed. Signs of cattle grazing and timber harvest were observed in both sections. In Section 113, there were areas too deep or wide to effectively electrofish with one backpack shocker.

Discussion

In 2012, the HWTP conducted a survey to evaluate brown trout distribution and in Trout Creek (Hogan et al. 2012). Surveys were limited in geographic scope and zero brown trout were captured. The 2013 surveys increased the length of sampling and found brown trout in less than one mile of habitat downstream of the USFS Trout Creek Campground. No physical barriers to upstream fish migration were present to limit the upstream distribution of brown trout and lack of suitable upstream habitat may be the limiting factor. In 2007 and 2008, genetic analyses identified two distinct populations of MRRT within Trout Creek, one of which was believed to have low levels of introgression with rainbow trout (Stephens et al. 2013). This putative population was identified in the upper portion of the creek and no barriers to upstream migration were identified that might explain genetic variance between the populations. In 2013, the HWTP increased the geographic extent of tissue collection to include areas downstream and upstream of previous samples in an effort to better understand the distribution of putative and introgressed MRRT. These samples are pending analysis.

Trout Creek is a popular fishery, particularly for anglers targeting MRRT in their native drainage. A USFS campground provides access and recreational opportunities. Land use includes timber harvest on private land as well as Shasta-Trinity National Forest grazing allotments. The USFS has been

conducting manual removal efforts of brown trout in Trout Creek using backpack shockers and the HWTP recommends a collaborative effort of increased frequency and intensity to remove the threat of non-native fish in the designated MRRT refugium area. In addition, the HWTP recommends continued fisheries and habitat assessments in Trout Creek to monitor the MRRT population and evaluate angler use.

References

Hogan, S. and C. Zuber. 2012. Trout Creek 2012 summary report. State of California. Natural Resources Agency. Department of Fish and Wildlife. Heritage and Wild Trout Program. Rancho Cordova, CA.

Moyle, P. B., R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayake. 1995. Fish species of special concern in California, 2nd edition. Prepared for the California Department of Fish and Game, Rancho Cordova, CA.

Stephens, M., B. Erickson, M. Finger, R. Simmons, and B. May. 2013. Final report: Genetic analysis of Native California Trout (Phase 6). Genomic Variation Laboratory, University of California, Davis.

U.S. Fish and Wildlife Service. 1994. Endangered and threatened wildlife and plants: animal candidate review for listing as endangered or threatened species. Federal register 219: (15 November 1994): 58985.

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USFS. 1998. Redband trout habitat conservation management plan 1980. Shasta-Trinity National Forest. Redding, CA.

Figure 1. Vicinity map of Trout Creek 2013 survey locations

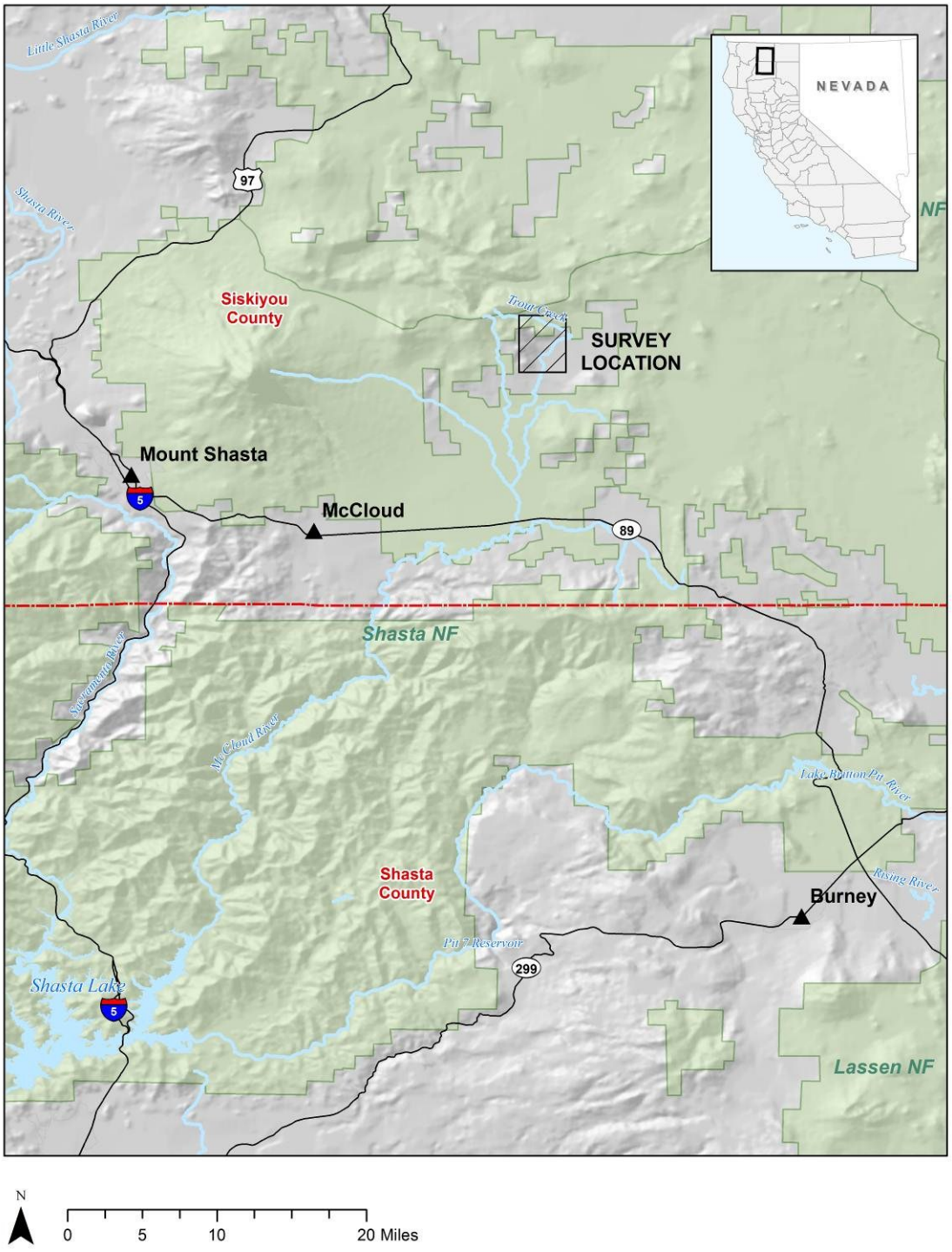

Figure 2. Detail maps of 2012 and 2013 Trout Creek electrofish survey locations, observed brown trout distribution, and upstream fish distribution

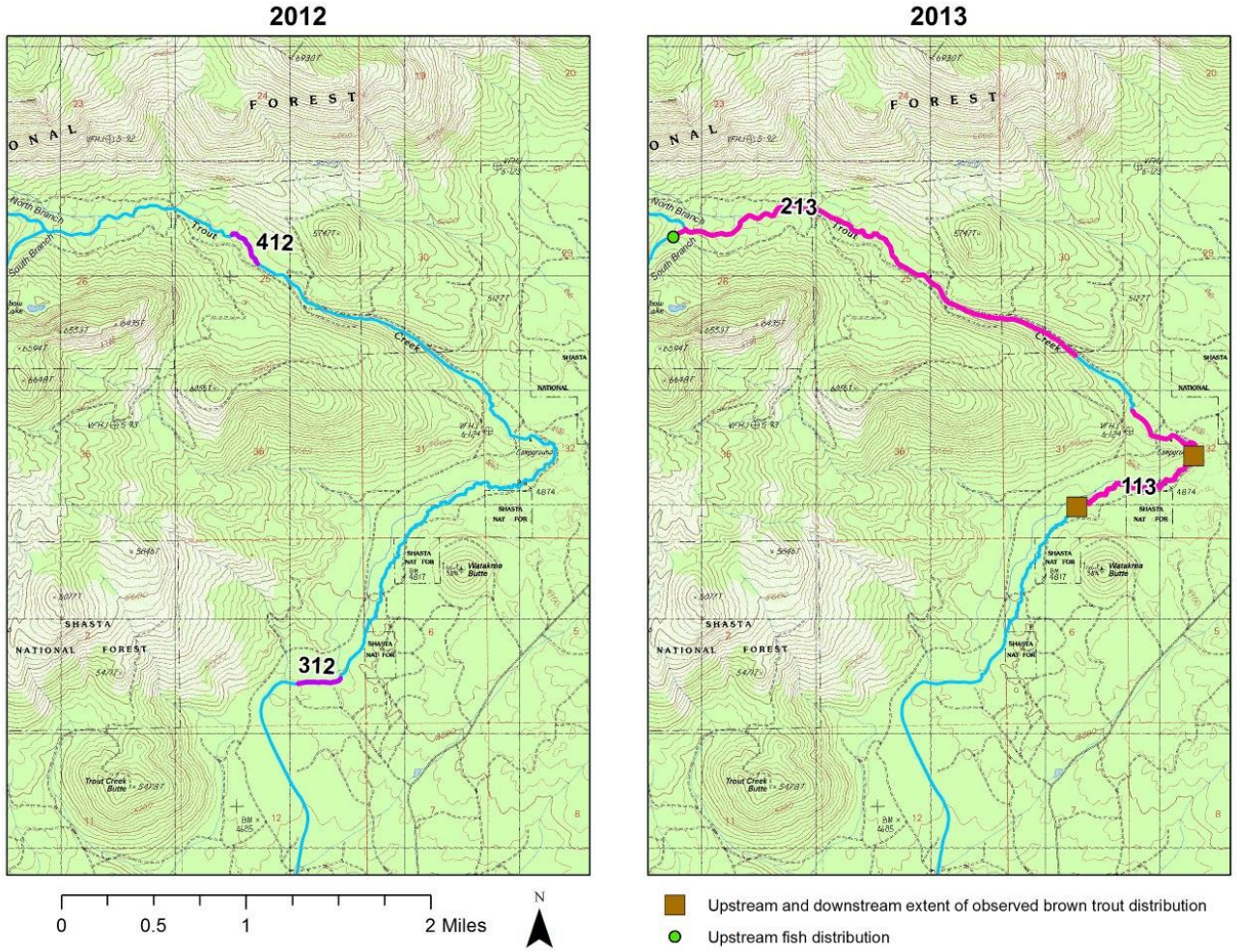

Figure 3. Aerial map of 2013 Trout Creek electrofish survey locations, observed brown trout distribution, and upstream fish distribution

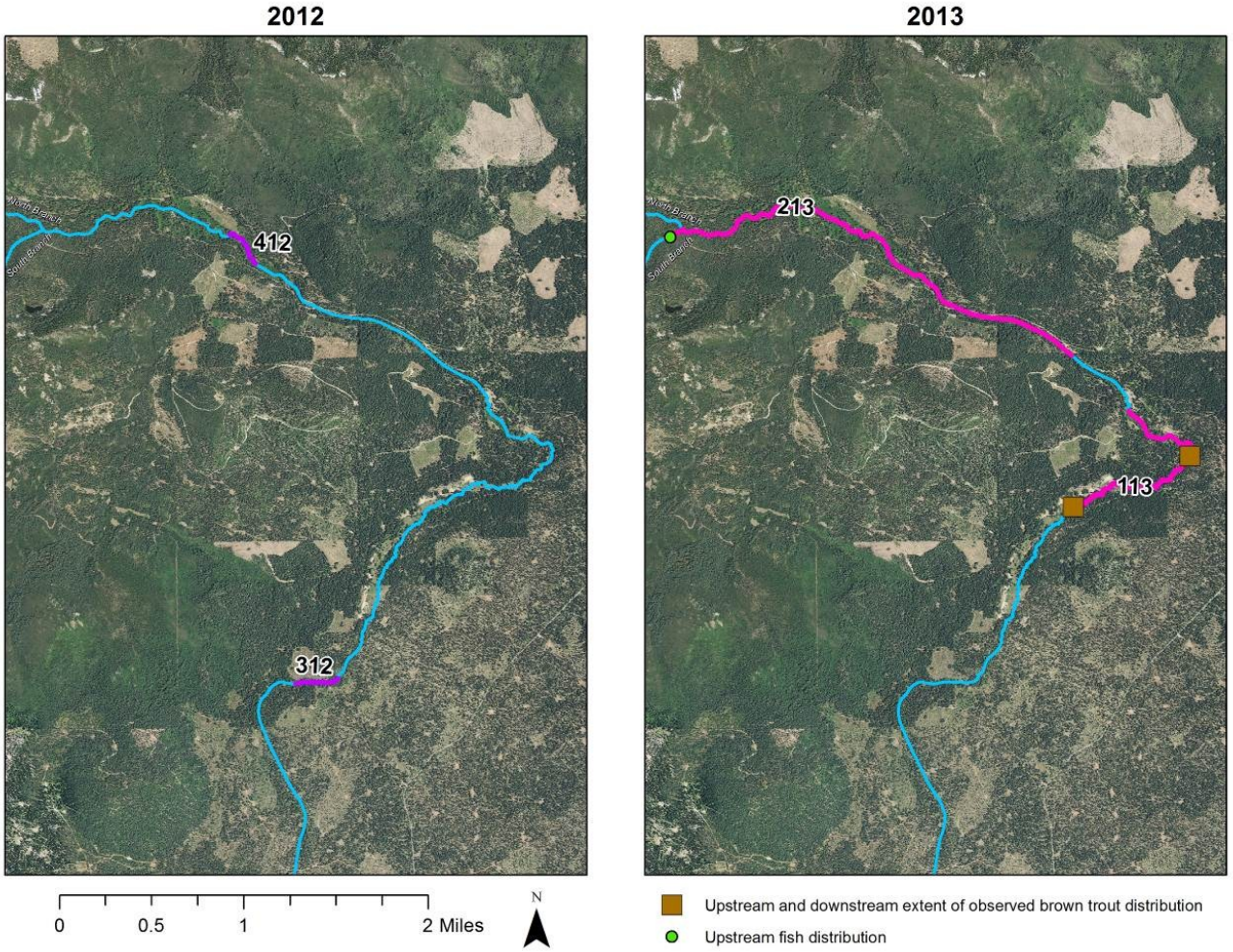

Figure 4. Representative photos of captured MRRT sampled for genetics from Section 113 (top) and Section 213 (bottom) in 2013

Figure 5. Length frequency histogram of brown trout captured in Trout Creek in 2013

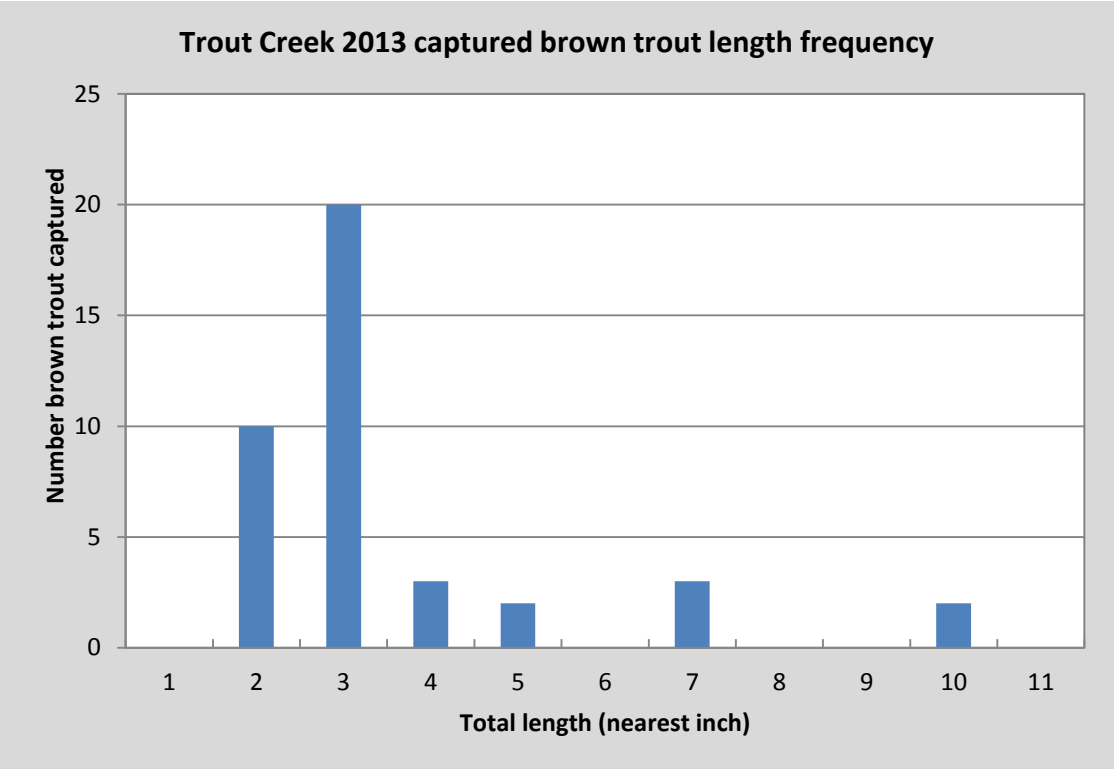

Figure 6. Length frequency histogram of MRRT captured in Trout Creek in 2013