State of California
Department of Fish and Wildlife

M e m o r a n d u m

Date: 12/28/2017

To: Sarah Mussulman
Senior Environmental Scientist (Supervisor)
North Central Region

From: Isaac Chellman
Environmental Scientist – High Mountain Lakes
North Central Region

Cc: Region 2 Fish Files

Subject: Fisheries monitoring in Alpine County – Highland Lakes (15187 and 15206).

On August 16–17, 2016, California Department of Fish and Wildlife (CDFW) conducted fisheries monitoring surveys at Highland Lakes (Lower Highland Lake, CA Lakes ID 15187, Figure 1; Upper Highland Lake, CA Lake ID 15206, Figure 2; Figure 3) in Alpine County. One overnight gill net was set in Lower Highland Lake for 14.5 hours and returned 44 brook trout (*Salvelinus fontinalis*). One overnight gill net was set in Upper Highland Lake for 13 hours and returned 44 brook trout. Due to the number of brook trout captured, CDFW will not resume plants in Highland Lakes. CDFW will manage both Highland Lakes as self-sustaining brook trout fisheries.

Figure 1: Lower Highland Lake (15187), looking northeast, on 8/17/2016 (CDFW).

Figure 2: Upper Highland Lake (15206), looking northeast, on 8/17/2016 (CDFW).

INTRODUCTION

Highland Lakes are relatively large lakes located between Folger and Hiram Peaks in south-central Alpine County. CDFW stocked both lakes with fingerling brook trout during most years between 1950 and 2000. In addition, CDFW stocked rainbow trout (*Oncorhynchus mykiss*) in Lower Highland Lake from 1967–1970 and fingerling Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) in 1977. CDFW also stocked rainbow trout in Upper Highland Lake from 1976–1979 and Lahontan cutthroat trout in 1976.

Gill net fishery surveys conducted in 2001 suggested brook trout might persist in Highland Lakes (Figures 4 and 5), but because trout stocking occurred in both lakes until 2000, an additional survey was necessary to determine the status of the fishery.

As directed by the Hatchery Operations EIS/EIR (Jones and Stokes 2010) CDFW is currently evaluating the location and status of stocked and formerly stocked backcountry fisheries. All data gathered as part of this study will be incorporated into the High Mountain Lakes database and made available to both federal and state agencies. Data from this memorandum will benefit CDFW in future efforts for fish stocking and wild trout management in the North Central Region.

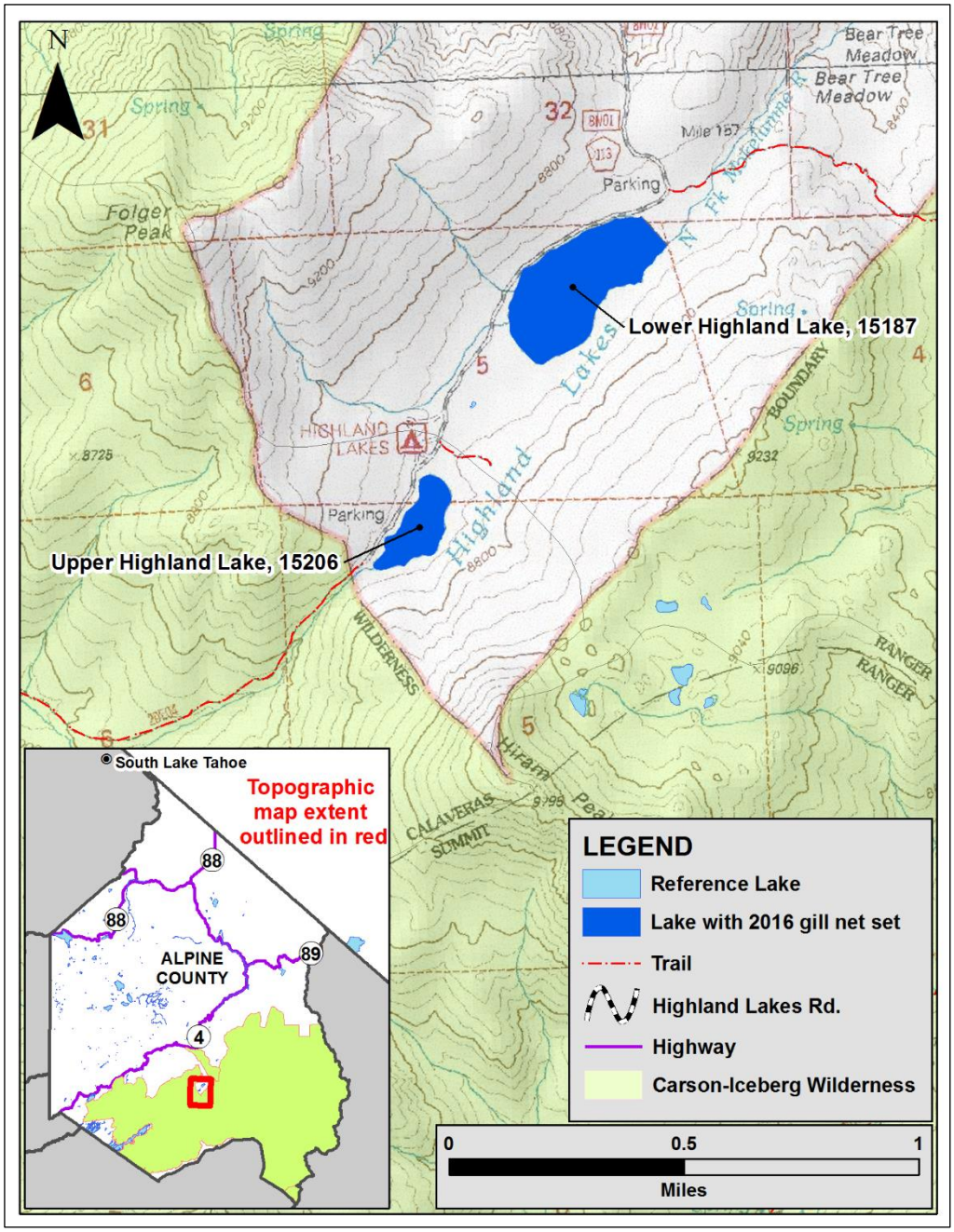

Figure 3: Location of the survey area in south-central Alpine County. Highland Lakes were surveyed on August 16–17, 2016.

ENVIRONMENTAL SETTING

Lower Highland Lake has a surface area of 14.3 hectares and a maximum recorded depth of 14.5 meters. Upper Highland Lake has a surface area of 4.1 hectares and a maximum recorded depth of 7.1 meters. Both lakes have littoral zone habitat consisting primarily of silt, sand, and gravel. Terrestrial habitat consists of mixed conifer forest, meadows, and rocky scree and talus slopes at an elevation of approximately 2620 meters above mean sea level.

In Lower Highland Lake, surveyors observed brook trout adults and fry near the inlet stream. In Upper Highland Lake, surveyors observed brook trout adults and fry near the outlet stream.

Access to Highland Lakes is via Highland Lakes Road, which connects to state Highway 4, just west of Ebbetts Pass. A campground is present between the two lakes and multiple anglers on pontoon boats were observed on Lower Highland Lake by CDFW crews during the 2016 survey. Although the lakes are located close together, each drains into a separate watershed. Lower Highland Lake marks the headwaters of the North Fork Mokelumne River. Upper Highland Lake flows into Highland Creek, which eventually drains to the North Fork Stanislaus River. Highland Lakes are set just outside the Carson-Iceberg Wilderness and Stanislaus National Forest manages the land in the watershed.

RESULTS

On August 16–17, 2016, one standard, variable mesh sinking gill net was set overnight for 14.5 hours near the inlet in Lower Highland Lake and returned 44 brook trout (Figures 6 and 8). During the same night, another gill net was set for 13 hours near the outlet in Upper Highland Lake and returned 44 brook trout (Figures 7 and 9). (The identical number of trout captured in each of the two gill net sets is coincidental).

Based on the number and size classes of brook trout captured during the 2016 surveys, CDFW expects that brook trout will persist in both lakes; therefore, fish stocking at Highland Lakes will not resume, and CDFW will manage these lakes as self-sustaining brook trout fisheries.

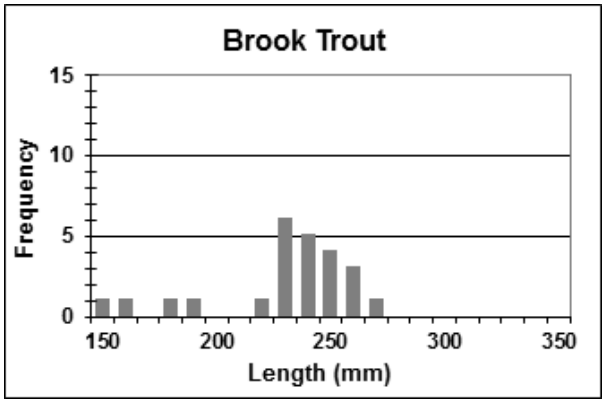

Figure 4: Brook trout histogram from August 1–2, 2001, gill net survey at Lower Highland Lake.

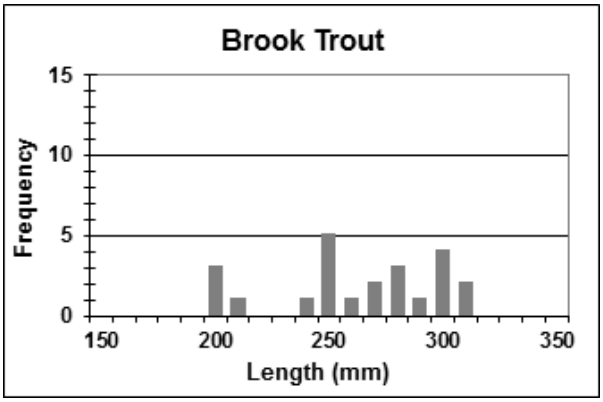

Figure 5: Brook trout histogram from July 31–August 1, 2001, gill net survey at Upper Highland Lake.

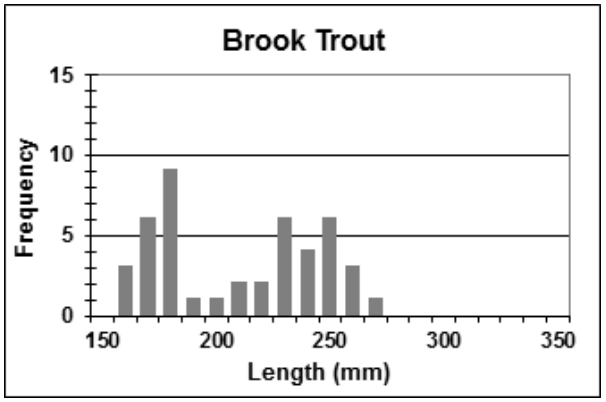

Figure 6. Brook trout histogram from August 16–17, 2016, gill net survey of Lower Highland Lake.

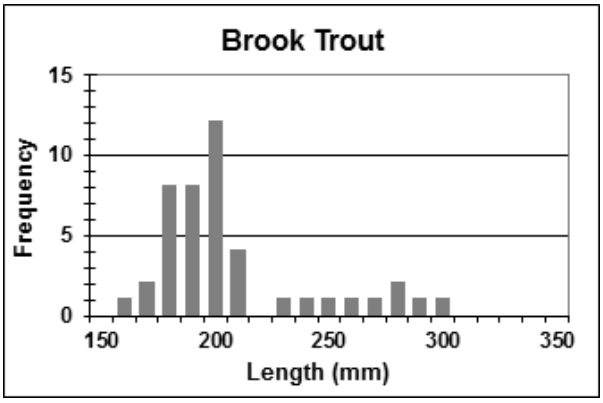

Figure 7. Brook trout histogram from August 16–17, 2016, gill net survey of Upper Highland Lake.


Figure 8. Brook trout captured during an overnight gill net set in Lower Highland Lake, Alpine County, CA on August 16–17, 2016.


Figure 9. Brook trout captured during an overnight gill net set in Upper Highland Lake, Alpine County, CA on August 16–17, 2016.

LITERATURE CITED: Jones & Stokes. 2010. Hatchery and Stocking Program Environmental Impact Report/Environmental Impact Statement. State clearinghouse #2008082025.