State of California
Department of Fish and Wildlife

M e m o r a n d u m

Date: July 11, 2014

To: Kevin Thomas
Senior Environmental Scientist (Supervisor)
Department of Fish and Wildlife

From: Kenneth N. Kundargi
Environmental Scientist

Subject: Meadow Lake Gillnet Survey April 17-18, 2014

Meadow Lake, located in Nevada County, is a 232 surface acre reservoir located at 7289 feet elevation in the Tahoe National Forest north of Highway 80 in the Canyon Creek area (Figure 1). Meadow Lake impounds several small unnamed streams and flows to Fordyce Reservoir which is part of the South Yuba River drainage. These tributaries provide limited spawning and rearing habitat for salmonid species.

The California Department of Fish and Wildlife (Department) has stocked Meadow Lake since 1938 with brook trout (*Salvelinus fontinalis*), with rainbow trout (*Oncorhynchus mykiss)*, and Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) to provide recreational angling opportunity and to supplement natural production. Currently, the Department employs a put-and-grow stocking strategy utilizing annual Lahontan cutthroat fingerling plants of approximately 5,000 fish though plants of 20,000 to 25,000 occurred from 1993-2000. No stocking occurred between 2001 and 2008. The Lahontan cutthroat fingerling stocking has not been evaluated in recent years. Rainbow trout were last stocked in 1993 and brook trout were last stocked in 1978.

On June 18, 2014 scientific aides Kevin Langham and Shawn Cox conducted a first phase general fish survey via gillnets. The purpose of this first phase sampling effort was to gather basic fisheries information at low cost, an effort which will guide fisheries managers in making management decisions if adequate; or guide further research and assessment efforts if necessary. Two variable mesh gillnets were set in the northeastern end of the lake in 2014 in order to conduct the general fish survey (Figure 1). These nets sets were made set perpendicular to the shoreline for a distance of approximately 100 feet. Set time was approximately 17:00 on May 18, 2014 and pull time was approximately 12:00 on May 19, 2014. Water temperature was 19 degrees

Celsius. Fish captured were identified to species and measured to the nearest millimeter total length.

Three species of fish were collected and Lahontan cutthroat trout dominated the salmonid catch with 34 specimens collected. Four rainbow trout and thirteen bullheads (*Ameiurus nebulosus*) were also collected. The number of salmonids captured prevents robust statistical analysis; however, basic conclusions can be drawn.

Assessment of Lahontan cutthroat trout data indicates that fingerling Lahontan cutthroat trout stocked under a put and grow strategy are indeed growing to trophy size with a mean size of 389 mm ± 32 mm total length at the 95% confidence level with a range of 132 to 521 mm (Table 2, Figure 2). Generally, a fishery with specimens larger than 18 inches (457 mm) is considered to have a trophy component and stocked Lahontan cutthroat trout are reaching these proportions in Meadow Lake (Figure 2)

The four rainbow trout sampled were 300, 303, 326, and 326 mm total length (Figure 3). Because catchable size rainbow trout were last stocked in 1993 these fish appear to be the result of natural production. There are indications that these fish are hybridized with Lahontan cutthroat trout. The degree of natural reproduction and hybridization could be evaluated by fin-clipping all stocked fish in conjunction with further sampling; however, the cost is prohibitive and the effort largely unnecessary because the purpose of stocking if to provide recreational angling rather than establishing a population of pure strain Lahontan cutthroat trout.

Brown bullhead appear to be common in Meadow Lake as indicated by the 13 specimens captured in the gillnet sets. They do not appear to be overpopulating the lake and reducing angling opportunity for stocked trout (Figure 3). While this species may provide forage for adult salmonids they are also competitors with fingerling and juvenile salmonids.

Overall, the results of this general fisheries survey indicate that the fishery is viable in the context of recreational fishing opportunity and that the stocking allocation is providing a trophy component. The overall number of Lahontan cutthroat trout stocked annually (5000 fingerlings) is relatively low compared to surface acreage (232 acres) at approximately 22 fingerlings/surface acre. Generally, in an oligotrophic high elevation lake such as Meadow Lake a fingerling stocking rate of 100 fingerlings/surface acre would be considered appropriate and not excessive[1]. This would equate to a stocking allocation of 23,000 fingerling Lahontan cutthroat trout which is approximately what the lake received from 1993-2000. Stocking at this rate would likely result in higher catch rate at the expense of the trophy component in the fishery. While Meadow Lake could absorb increased fingerling planting to 25,000 fingerlings per year, the recommendation for this fishery is to maintain the 5,000 fingerling Lahontan cutthroat trout fingerling stocking allocation with periodic increased stocking as surplus cutthroat are available.

[1] Rainbow Trout Stocking In Inland Lakes and Streams: An Annotated Bibliography and Literature Review, S.J. Kerr and T.A. Lasenby, Fish Section Fish and Wildlife Branch, Ontario Ministry of Natural Resources. August 2000, Pages 9-11.

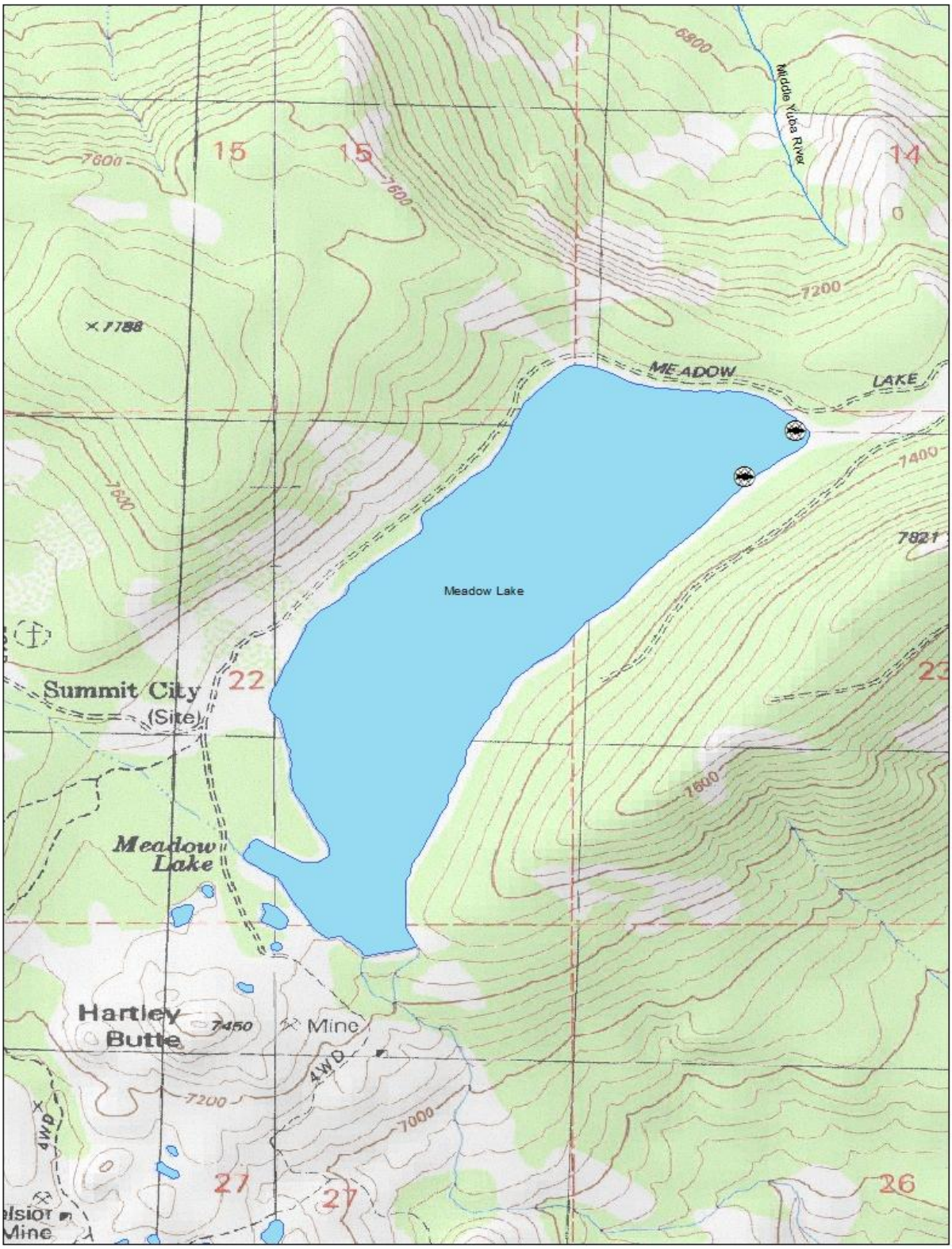

Figure 1. Meadow Lake and location of gillnet sets Meadow Lake gillnet survey June 18, 2014.

Table 1 Descriptive statistics for Lahontan cutthroat trout total lengths (mm) Meadow Lake Gillnet Survey June 18, 2014.

Statistic	Value
Mean	389.5882353
Standard Error	15.64798357
Median	414.5
Mode	427
Standard Deviation	91.24263944
Sample Variance	8325.219251
Kurtosis	0.036907608
Skewness	-0.651002621
Range	389
Minimum	132
Maximum	521
Sum	13246
Count	34
Largest(1)	521
Smallest(1)	132
Confidence Level (95.0%)	31.83606194

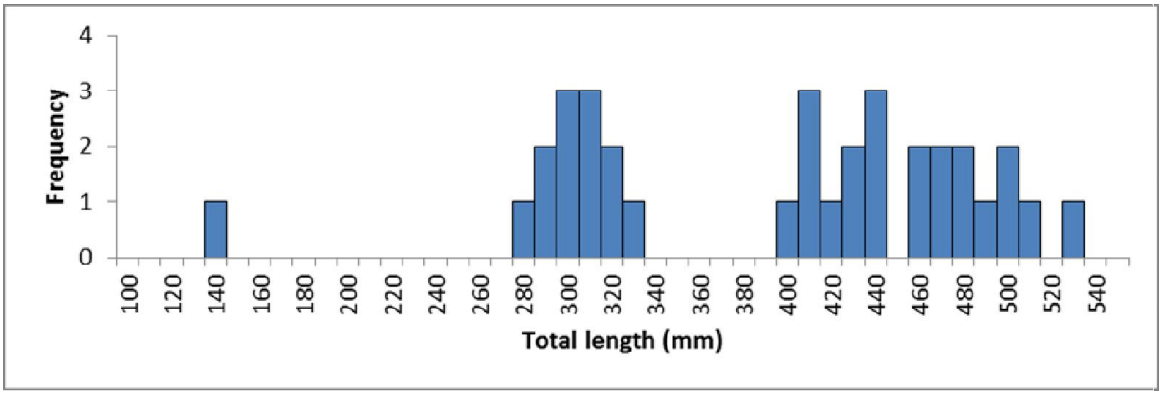

Figure 2. Length frequency Lahontan cutthroat trout Meadow Lake gillnet survey June 18, 2014.

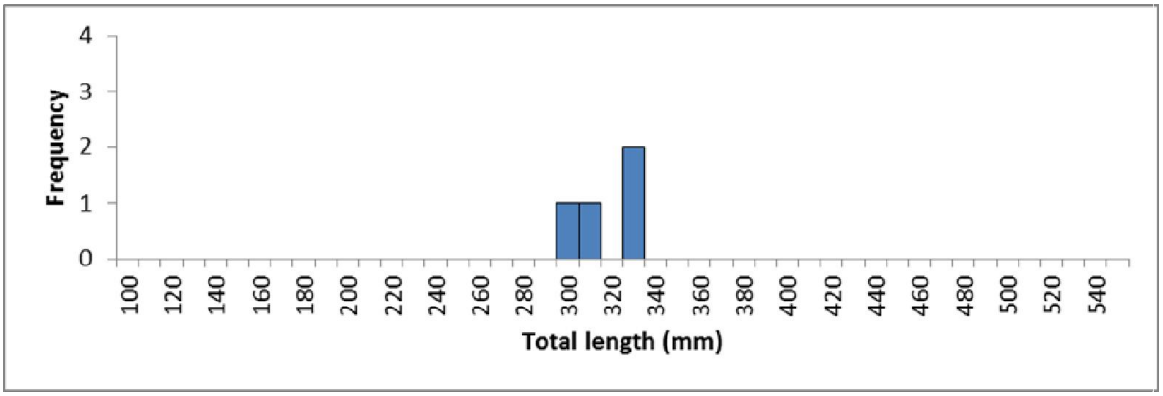

Figure 3. Length frequency rainbow trout Meadow Lake gillnet survey June 18, 2014.

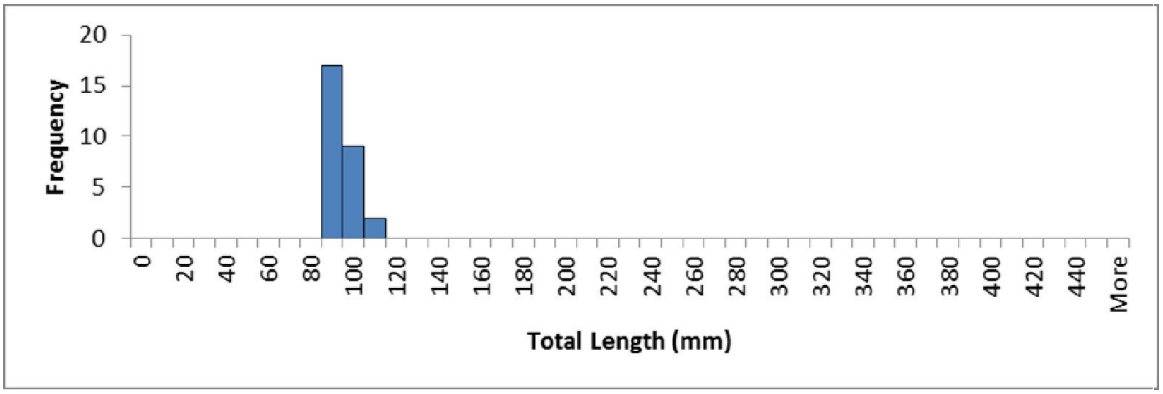

Figure 4. Length frequency brown bullhead Meadow Lake gillnet survey June 18, 2014.