

**State of California  
Department of Fish and Wildlife**

## **M e m o r a n d u m**

**Date:** June 10, 2014

**To:** Kevin Thomas  
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**From:** Kenneth N. Kundargi  
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**Subject: Bowman Reservoir Gillnet Survey April 17-18, 2014**

Bowman Reservoir, located in Nevada County, is a 750 surface acre 68,510 acre foot reservoir located at 5566 feet elevation in the Tahoe National Forest north of Highway 80 (Figure 1). Bowman Lake Dam impounds Canyon and Jackson Creeks which are part of the South Yuba River drainage. These tributaries provide the primary spawning habitat for salmonid species.

The California Department of Fish and Wildlife (Department) stocked Bowman Reservoir from 1930-2014, primarily with rainbow trout (*Oncorhynchus mykiss*) and kokanee salmon (*Oncorhynchus nerka*), to provide recreational angling opportunities and supplement natural production. Currently, the Department employs a put-and-grow stocking strategy utilizing rainbow trout fingerling plants of approximately 20,000 fish. This stocking strategy has not been evaluated in recent years. Kokanee salmon plants were discontinued after 2012 due to overpopulation and stunting. Kokanee were not captured nor expected to be captured due to their pelagic nature. Other methods such as spawning surveys are more utilitarian for evaluating their population status and were employed to make the decision to discontinue kokanee stocking. Brown trout (*Salmo trutta*) were stocked intermittently since 1930 and last stocked in 2000.

On May 7<sup>th</sup> fisheries biologist Kenneth N. Kundargi and scientific aides Mike Mamola, Nick Hood, and Kassie Hickey conducted a first phase general fish survey via gillnet. The purpose of this first phase sampling effort is to gather basic fisheries information at low cost, an effort which will guide fisheries managers in making management decisions if information is adequate or guide further research and assessment efforts if necessary. Two variable mesh gillnets were set in the eastern end of the lake in 2014 in order to conduct a general fish survey (Figure 1). These nets sets were

perpendicular to the shoreline for a distance of approximately 100 feet. Set time was approximately 15:00 on May 7, 2014 and pull time was approximately 11:00 on May 8, 2014. Water temperature was 10 degrees Celsius. Fish captured were identified to species and measured to the nearest millimeter total length.

Three species of fish were collected during the survey. Brown trout dominated the salmonid catch with 13 specimens collected, three rainbow trout and twenty-eight Lahontan redbreast (*Richardsonius egregius*) were also collected (Table 1). The low number of salmonids captured prevents robust statistical analysis; however, basic conclusions can be drawn.

Assessment of brown trout data indicates that brown trout are self-sustaining and contributing to the fishery with a mean size of 349 mm  $\pm$  28 mm total length at the 95% confidence level with a range of 263 to 421 mm (Table 2, Figure 2). Because brown trout were last stocked in 2000 it is unlikely that these brown trout were from the 2000 fingerling plant. While these wild brown trout are contributing to fishing opportunity the approximate ten year interval of 20,000 brown trout historic stocking would be beneficial to the fishery to hedge against periodic drought and subsequent poor spawning conditions.

Three rainbow trout were sampled and were 94, 286, and 301 mm total length (Table 1, Figure 2). The basic conclusions that can be drawn from these limited data are that rainbow trout are present in the water and part of the fishery although it is impossible to distinguish whether these fish were the result of fingerling planting or wild production. In order to evaluate the success of the rainbow trout fingerling stocking allocation these fish would need to be marked then sampled when they reach catchable size. This could be accomplished through creel survey and/or gillnetting but the expense and time commitment of fin-clipping and further sampling is prohibitive and largely unnecessary because the fishery is not reported to be poor or otherwise lacking.

Lahontan redbreast appear abundant in Bowman Lake as indicated by the 27 specimens captured in the gillnet sets (Table 1, Figure 3). This species is native to the eastern Sierra Nevada and introduced into the Yuba River drainage. While this species provides forage for adult salmonids they are also competitors for 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. The overall number of rainbow trout stocked annually (20,000 fingerlings) is relatively low compared to surface acreage (750 acres) at 27 fingerlings/surface acre. Generally, in a mesotrophic lake such as Bowman Lake a fingerling stocking rate of 200 fingerlings/surface acre would be considered appropriate and not excessive. This would equate to a stocking allocation of 150,000 fingerling rainbow trout. While stocking at this rate would likely result in compensatory and competitive interactions with wild rainbow trout, brown trout, and kokanee salmon; Bowman Lake could absorb increased fingerling rainbow trout planting as excess fingerlings become periodically available in the Department's

hatchery system at a rate of 150,000 annually. The recommendation for this fishery is to utilize a conservative stocking strategy of 100 fingerlings/surface acre. This would result in an annual stocking allocation of 75,000 fingerling brown and rainbow trout total.

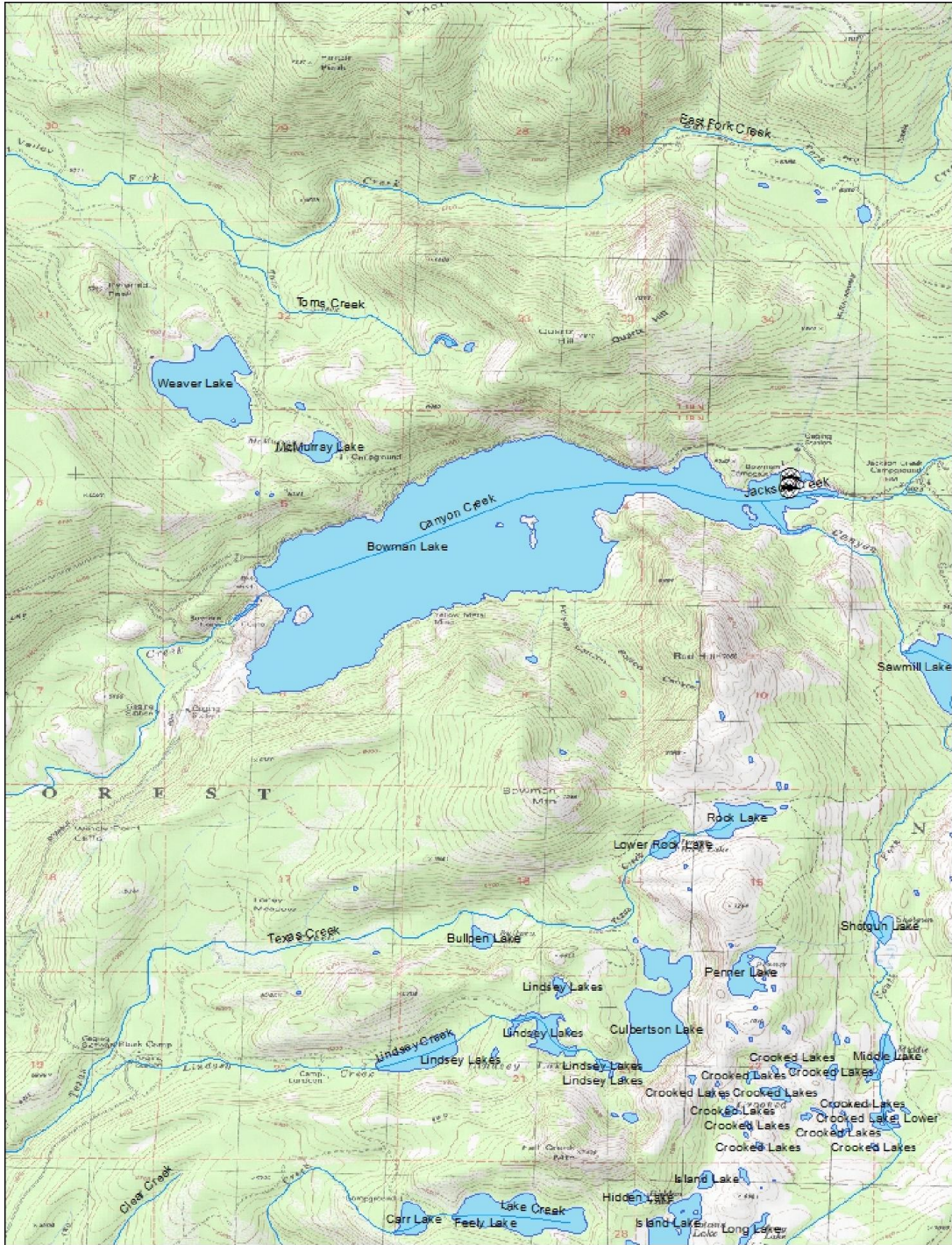


Figure 1 Bowman Lake and location of gillnet sets May 7, 2014 gillnet survey

**Table 1 Summary net set, species and total length for Bowman Lake gillnet survey May 7-8, 2014.**

<b>Net Set</b>	<b>Species</b>	<b>Total length (mm)</b>
1	BN	375
1	BN	408
1	BN	295
2	BN	371
2	BN	300
2	BN	350
2	BN	421
2	BN	326
2	BN	320
2	BN	356
2	BN	263
2	BN	400
2	BN	359
2	RT	301
2	RT	286
2	RT	94
1	LRS	87
1	LRS	87
1	LRS	86
1	LRS	92
1	LRS	88
2	LRS	90
2	LRS	90
2	LRS	87
2	LRS	89
2	LRS	87
2	LRS	84
2	LRS	105
2	LRS	95
2	LRS	93
2	LRS	89
2	LRS	85
2	LRS	93
2	LRS	101
2	LRS	85
2	LRS	96
2	LRS	87
2	LRS	93
2	LRS	86
2	LRS	88
2	LRS	97
2	LRS	99
2	LRS	91
2	LRS	85

**Table 2 Descriptive statistics for the brown trout total lengths (mm) Bowman Reservoir gillnetting.**

<b>Statistic</b>	<b>Value</b>
Mean	349.5385
Standard Error	13.07161
Median	356
Mode	N/A
Standard Deviation	47.13034
Sample Variance	2221.269
Kurtosis	-0.66035
Skewness	-0.23513
Range	158
Minimum	263
Maximum	421
Sum	4544
Count	13
Largest(1)	421
Smallest(1)	263
Confidence Level (95.0%)	28.48058

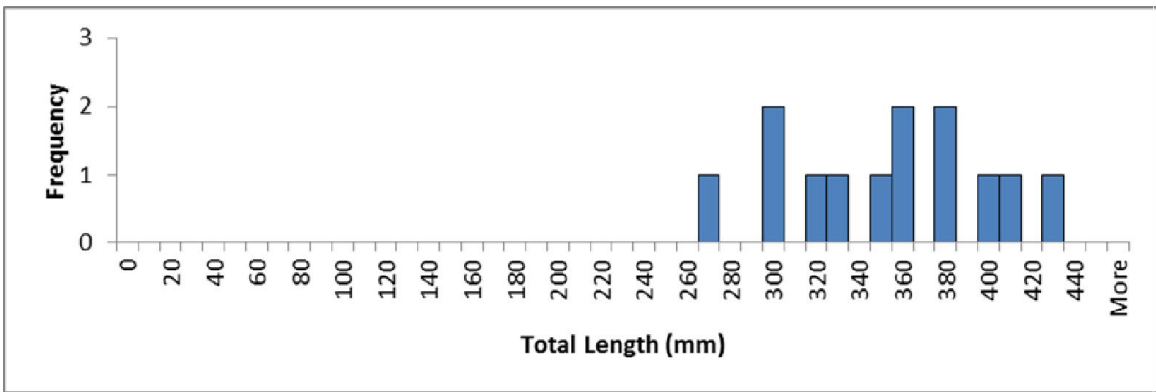


Figure 2 Length frequency for brown trout Bowman Lake gillnet survey May 7, 2014

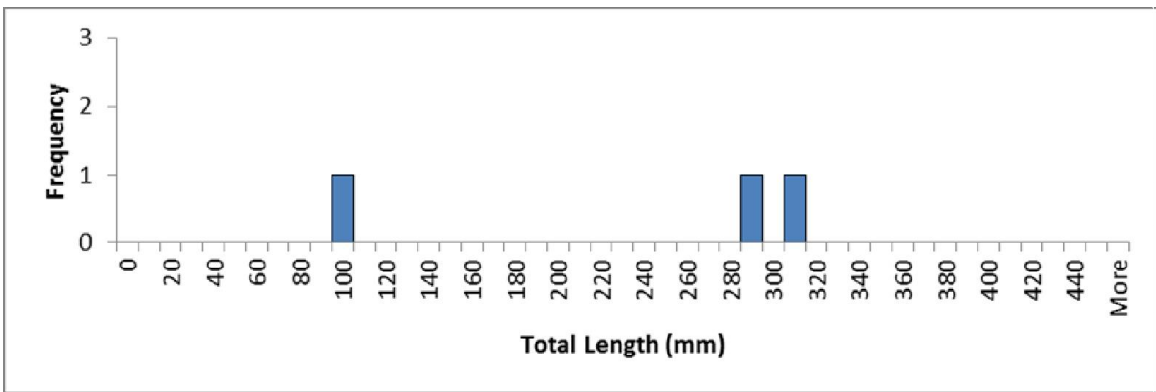


Figure 3 Length frequency rainbow trout Bowman Lake gillnet survey May 7, 2014

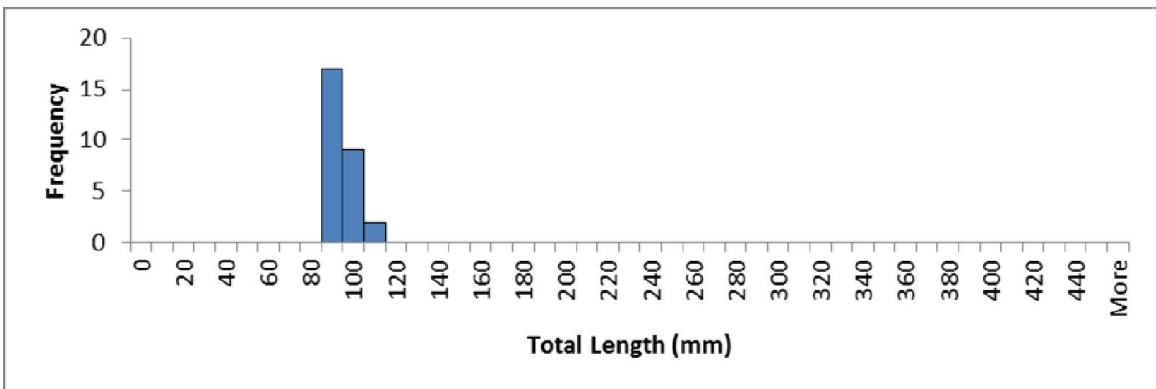


Figure 4 Length frequency Lahontan reddsides Bowman Lake gillnet survey May 7, 2014