

State of California
California Department of Fish and Wildlife
North Central Region

Summary Report of Roving Creel Surveys (2012 - 2013) and 2015 - 2020 Angler
Survey Box Analysis at Lower Bear River Reservoir, Amador County



By
Ben Ewing
District Fisheries Biologist
Alpine, Amador, Calaveras, and Lake Counties

October 2020

Introduction

Lower Bear River Reservoir (Lower Bear) is located in Amador County and situated in the Eldorado National Forest. Lower Bear is off Highway 88 (Carson Pass) and is approximately 40 miles northeast of Jackson (**Figure 1**). Lower Bear covers an area of 710 surface acres with approximately nine miles of shoreline, has a storage capacity of 48,750 acre-feet of water, and is 5,824 feet above mean sea level (California Department of Water Resources [DWR] 2019). Pacific Gas and Electric Company (PG&E) manages Lower Bear water for hydroelectric generation (DWR 2019). A dam divides Upper Bear River Reservoir (Upper Bear) from Lower Bear. Upper Bear is more remote and access requires a significant hike, boat ride from Lower Bear, or access through an adjacent Boy Scouts of America camp. The easier access results in Lower Bear receiving most of the fishing pressure.

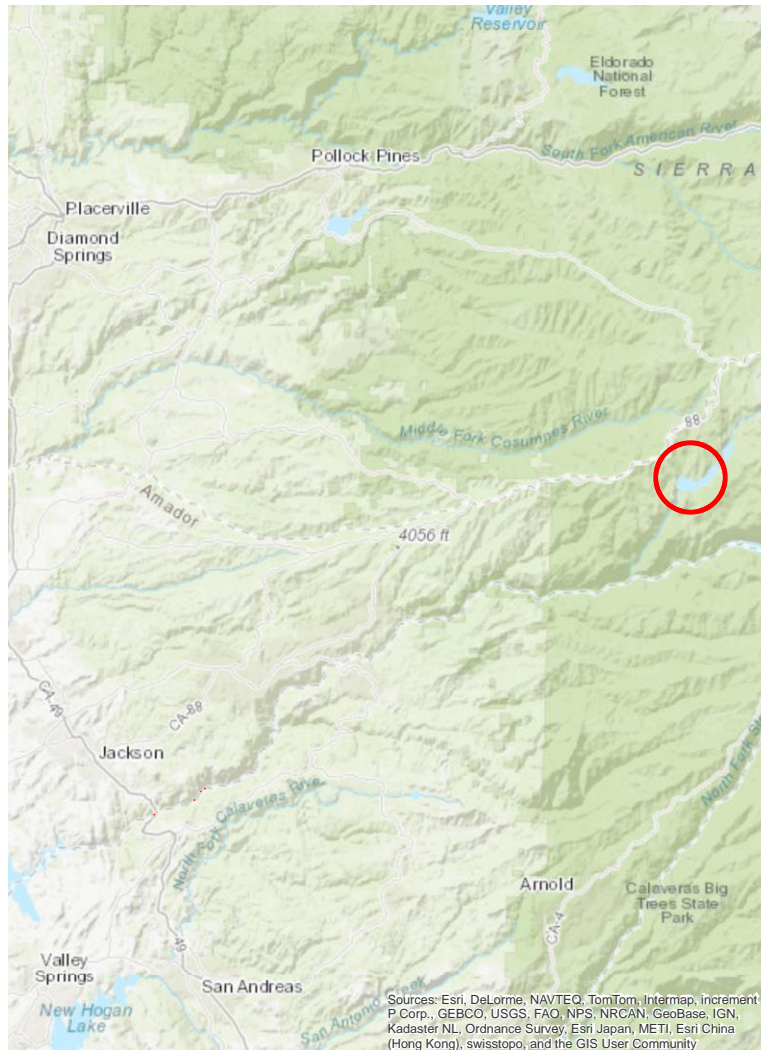


Figure 1. Lower Bear River Reservoir (Amador County).

There are two angler survey boxes (ASB) at Lower Bear. One is located at the main boat launch at the Bear River Lake Resort and the second is near the west side of the outlet dam (**Figure 2**).



Figure 2. Lower Bear River Reservoir ASB locations. One ASB is located at Bear River Resort while the second ASB is located by the dam. Inset map shows Lower Bear River Reservoir in relation to California.

Campgrounds and cabins are located around the reservoir, which makes Lower Bear ideal for multi-day usage. In addition to fishing, the area surrounding Lower Bear supports recreational activities including hiking, hunting, boating, all-terrain vehicle trails, kayaking, canoeing, and swimming. Depending on road conditions, Lower Bear also provides terrain for snowmobiling, cross-country skiing, and ice fishing in the winter. Lower Bear is a well-known trout fishery, containing Brown Trout (*Salmo trutta*) (BN), Brook Trout (*Salvelinus fontinalis*) (BK), Rainbow Trout (*Oncorhynchus mykiss*) (RT), and Lake Trout (*Salvelinus namaycush*) (LT). California Department of Fish and Wildlife (CDFW), PG&E, and the Bear River Lake Resort regularly stock Lower Bear with trout ranging in size from fingerling (2.5 to 5 inches [in.]) to trophy (> 18 in.).

Methods

Anglers voluntarily filled out a survey form about their fishing experience at Lower Bear. The survey asks anglers for information regarding hours fished, fishing method, type of gear used, the number, and species of landed fish. Anglers were also asked the size of the fish landed and whether they kept or released their catch. Lastly, the survey asked anglers three questions pertaining to satisfaction with their overall angling experience, size, and number of fish. Answers were recorded on a scale of -2 to +2, with "+2" representing most satisfied and "-2" representing least satisfied. The back of the survey form provides space for additional comments. The 2012 and 2013 data used for comparison in this report was gathered using the roving creel survey (RCS) technique (Hickey 2013; Richardson 2014). The 2015 – 2020 data were collected via ASB. In July of 2020, CDFW removed both ASBs in order to move them to another fishery. Due to the ASBs being at Lower Bear for only half of 2020, total angler use and total catch data will not be compared to previous years.

Results

In 2020, twenty-four fish were reported caught. Average catch per hour for the eight-year average was 0.56. The catch per hour also decreased from a pre-2020 average of 0.62 to 0.17 in 2020 (**Table 1**). However, the catch per angler increased from a pre-2020 average of 2.60 to 3.00 in 2020.

Table 1. Collection of average effort and catch statistics recorded from the roving creel surveys in 2012 - 2013 and the 2015 - 2020 angler survey box (ASB) at Lower Bear River Reservoir, Amador County.

<u>Year</u>	<u>Catch per Hour</u>	<u>Catch per Angler</u>
2012	0.21	0.55
2013	0.28	0.77
2015	0.16	0.80
2016	0.57	2.37
2017	0.66	3.46
2018*	1.46	5.43
2019*	1.00	4.80
2020*	0.17	3.00
Overall Average	0.56	2.65
ASB only	0.67	3.31
Creel only	0.25	0.66

*From 2018 - 2020, a portion of ASB sheets did not have an area for the angler to record their time spent fishing, thus the number of hours from 2018 - 2020 is lower than expected. However, the catch per hour may still be an accurate representation of the 2018 - 2020 seasons. The 2020 Catch per Hour and Catch per Angler values may or may not be accurate since the entire 2020 season was not included.

Similar to 2017 and 2019, in 2020, lure anglers caught the greatest number of fish (n = 14) (**Table 2**). In 2018, both lure and bait anglers caught the greatest number of fish (n = 44), each. In 2012 and 2016, bait anglers caught the greatest number of fish (2012, n = 180; 2016, n = 50). In 2013 and 2015 multiple gear types caught the greatest number of fish (2013, n = 189; 2015, n = 4) (**Table 2**).

Table 2. The number of fish landed by the type of gear used from 2012 -2013 (Creel method) and 2015 - 2020 (Angler Survey Box method).

<u>Angling Method</u>	<u>2012</u>	<u>2013</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
Bait	180	160	0	50	7	44	21	10
Lure	14	53	0	12	33	44	25	14
Fly	4	6	0	6	0	8	NA	0
Multiple	49	189	4	5	0	29	2	0
Not recorded	NA	NA	NA	10	5	NA	NA	NA
Total	247	408	4	83	45	125	48	24

In 2020, 13 BK caught were in the < 6 in. length-class, comprising the most individuals in a single length class (**Figure 3**). In 2019, the 12.0 – 13.9 in. length-class

had the greatest numbers (**Figure 4**). In 2018, the 10.0 – 11.9 in. length-class had the greatest numbers (**Figure 4**). In comparison, 31 RT caught in 2016 were in the 6.0 – 7.9 in. length-class, which was the length class with the greatest number. The four BN caught in 2020 ranged between 8.0 – 15.9 inches (**Figure 3**). The one LT caught in 2020 was less than 6 inches (**Figure 3**). The RT caught in 2020 ranged between 6.0 – 9.9 inches (**Figure 4**). The 2012 – 2013, and 2015 – 2017 length-classes of fish caught at Lower Bear can be found in the 2013, 2014, and 2017 survey studies (Hickey 2013; Richardson 2014; Ewing 2018).

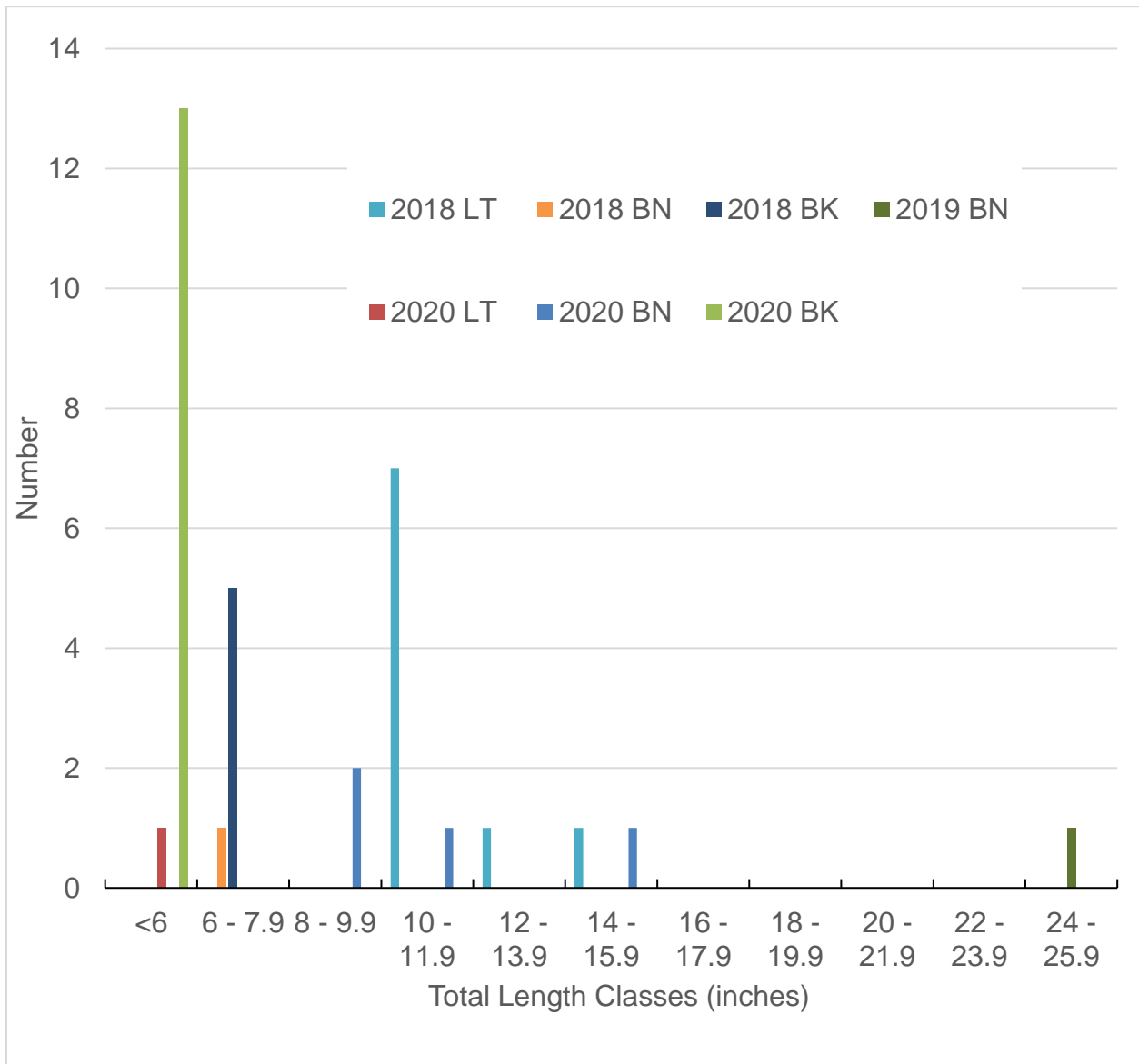


Figure 3. Frequency of measured LT, BK, and BN in each length class that anglers reported landing at Lower Bear River Reservoir (January, 2018 – July, 2020).

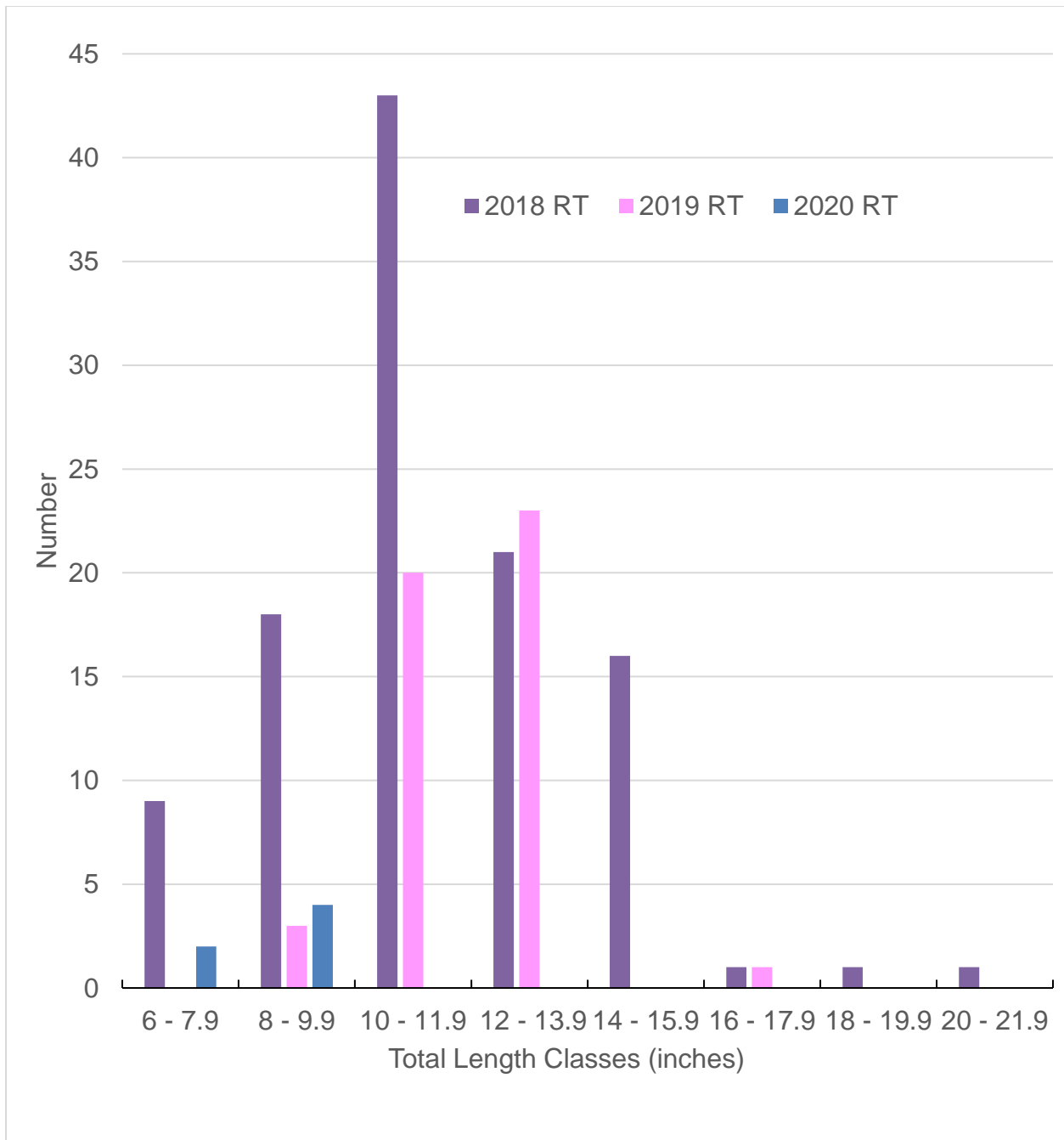


Figure 4. Frequency of measured RT in each length-class that anglers reported landing at Lower Bear River Reservoir (January, 2018 – July, 2020).

Six anglers (75.0%) reported fishing from shore/wading, which resulted in the best success in terms of catch per angler (4.00) in 2020 (**Table 3**). The shore/wading fishing method was also the most popular method of fishing in 2020 (n = 6). In 2020, boat/kayak had a 0.00 catch per angler value. In 2020, no anglers reported fishing from from a float tube.

Table 3. Number of anglers and catch per angler based on angling method at Lower Bear River Reservoir, 2018 - 2020.

Method	2018		2019		2020	
	Number of Anglers (%)	Catch per Angler	Number of Anglers (%)	Catch per Angler	Number of Anglers (%)	Catch per Angler
Not Recorded	3 (13.0%)	3.67	5 (50.0%)	4.40	0 (0.0%)	NA
Boat	6 (26.1%)	11.00	5 (50.0%)	5.20	2 (25.0%)	0.00
Shore/Wading	13 (56.5%)	3.08	0 (0.0%)	NA	6 (75.0%)	4.00
Float Tube	1 (4.3%)	8.00	0 (0.0%)	NA	0 (0.0%)	NA

In 2020, anglers reported being satisfied with their overall angling experience, size of the fish, and the number of fish caught (**Table 4**). This is the fourth consecutive year where all three satisfaction questions had a positive average response.

Table 4. Angler Satisfaction Response Averages for the Lower Bear River Reservoir Angler Survey Box, 2015 -2020 (Based on -2 to +2 Rating Scale).

Year	Overall Angling Experience	Size of the Fish	Number of Fish
2015	-0.75	0.00	-0.67
2016	-0.72	0.10	0.50
2017	0.36	0.60	1.20
2018	1.45	1.21	1.39
2019	1.00	1.71	1.57
2020	0.29	0.60	0.80

Discussion

The 2020 Lower Bear ASB results indicate anglers had the second lowest catch per hour rate compared to previous years. However, only three anglers reported their time spent fishing, with only two fish caught. It is possible the catch per hour rate would have been higher if the other five anglers recorded their time spent fishing. Although overall catch and catch per hour in 2020 was lower than the previous three years, the values may have been negatively influenced by removing the ASB before the end of the 2020 fishing season. Additionally, not all the RT that were stocked in 2020 by CDFW were stocked before July 15, the day both ASBs were removed. This would likely decrease the available trout for anglers to catch. Although the number of anglers who responded in 2020 was also the lowest in five years, CDFW attributes this to removing the ASBs early as well. Additionally, due to the COVID-19 pandemic, Bear River Resort reported record recreational usage on the lake (Bear River Resort Personal Communication). Leaving the ASBs for the entire season may have given CDFW a

larger respondent draw. Since CDFW surveyed hundreds of people each year with the roving creel and only 94 in six years with the ASB, the roving creel captured a more diverse group of anglers. However, using the ASB is less costly than creel surveys and able to collect information 24 hours a day, seven days a week.

The < 6 in. length-class had more fish than any other length class in 2020 for the first time in six years. Surprisingly, BK comprised 13 of the 14 in this length class. BK have not been stocked into Lower Bear since 1998, but appear to still be present.

Anglers were satisfied with both the number and size of fish they caught for a fifth straight year which suggests a productive fishery in recent years.

The overall fishing experience in 2020 for anglers was positive for the fourth consecutive year. It is likely the overall angling experience was positive from 2017 - 2020 because the number of fish and size satisfaction values have had high values for their respective years. The “satisfaction” trend may also be related to the “pounds stocked/year” trend.

CDFW, PG&E, and the Bear River Lake Resort stock RT at Lower Bear. The sizes of fish stocked included fingerling, sub-catchable, catchable, and trophy-size fish. Fingerling and sub-catchable trout are stocked under a put and grow management strategy, while catchable and trophy-size trout are stocked under a put and take management strategy. CDFW is now implementing a put and take strategy with the catchable RT and BN since it is likely most of the fingerling and sub-catchable size fish were not surviving to catchable sizes. Losee and Phillips (2017) found that RT in the 14 - 15 in. length-class were, on average, 12.5 times more likely to be caught by sport anglers than those in the smallest individual length-class (8 – 9 inch). Anglers may not be catching as many stocked fish as they could have due to the presence of large, predatory BN and LT in Lower Bear. CDFW is trying to transition over to a trophy-trout fishery (1 lb. and larger stocked RT) in the coming years to help survivability of RT stocked in Lower Bear. The number of pounds stocked will likely stay the same.

Lower Bear has a history of growing large RT, LT, and BN in the trophy-size (> 18 in.) length-classes. However, no trophy-size trout were caught in 2020 compared to only one trophy-size BN caught in 2019 and two trophy-size RT caught in 2018. Wiley et al. (1993) noted that larger trout are better able to avoid predators. This same hypothesis could be also happening in Lower Bear. The decrease in trophy-size RT caught may be due to the absence of trophy-size RT stocked by Bear River Resort in 2018 and 2019. Bear River Resort resumed stocking trophy-size RT in June of 2020, but none of these RT were seen in the ASB and few have been reported caught (Bear River Resort, Personal Communication). Gathering information on the trophy-sized component of fish populations can be challenging due to their rarity and their use of habitats unsuitable to traditional sampling techniques (Bayley and Austen 2002).

Four BN were caught in 2020 compared to only two the previous three years. Prior to the 2019 and 2020 stocking of BN, the most recent stocking of BN was 15,000 fingerlings in 2012. It is possible the two consecutive years of BN stocking, including

the catchable-size BN stocked in May of 2020, enhanced the BN fishery for anglers.

Although the 2020 ASB results were taken early, CDFW was satisfied with the number of respondents, especially since no report was originally planned for the 2020 season. It was easier to identify any overlying trends since the 2020 survey method was the sixth consecutive season of the ASB at Lower Bear. The 2020 survey year will be the last for at least a few years due to six years of surveys performed and informative data collected.

Recommendations

- Switch to stocking trophy-size RT.
- Switch to stocking catchable-size BN
- Keep stocking allotment weight the same for RT

References

1. Bayley, P. B., and D. J. Austen. 2002. Capture efficiency of a boat electrofisher. *Transactions of the American Fisheries Society* 131: 435 – 451.
2. California Department of Water Resources. 2019. Available from: http://cdec.water.ca.gov/cgi-progs/stationInfo?station_id=LWB
3. Ewing, B. 2018. Summary Report of Roving Creel Surveys (2012 - 2013) and 2015 - 2017 Angler Survey Box Analysis at Lower Bear River Reservoir, Amador County. California Department of Fish and Game. Available from: <http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=158954>
4. Hickey, K. 2013. 2012 Lower Bear River Reservoir Creel Census and Catchable Trout Evaluation Study. California Department of Fish and Wildlife. Region 2 Fish Files. Available from: <http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=62367>
5. Losee, J. P. and Phillips, L. 2017. Bigger is Better: Optimizing Trout Stocking in Western Washington Lakes. *North American Journal of Fisheries Management* 37:489 – 496. American Fisheries Society.
6. Richardson, L. 2014. 2013 Lower Bear River Reservoir Creel Census and Catchable Trout Evaluation Study. California Department of Fish and Wildlife. Region 2 Fish Files. Available from: <http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=155752>
7. Wiley, R. W., R. A. Whaley, J. B. Satake, and M. Fowden. 1993. Assessment of stocking hatchery trout: a Wyoming perspective. *North American Journal of Fisheries Management* 13: 160 – 17.

