

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

Summary Report of Roving Creel Surveys (2012 - 2013) and 2015 - 2017 Angler
Survey Box Analysis at Lower Bear River Reservoir, Amador County



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March 2018

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 (Ca. Dept. of Water Resources (DWR) 2012). Water levels at Lower Bear are managed by the Pacific Gas and Electric Company (PG&E) for hydroelectric uses (DWR 2018). A dam divides an upper and lower reservoir. Upper Bear Reservoir (Upper Bear) is much more isolated and access requires a significant hike, boat ride from Lower Bear, or access through an adjacent Boy Scout camp. The easier access results in Lower Bear receiving the majority of the fishing pressure.

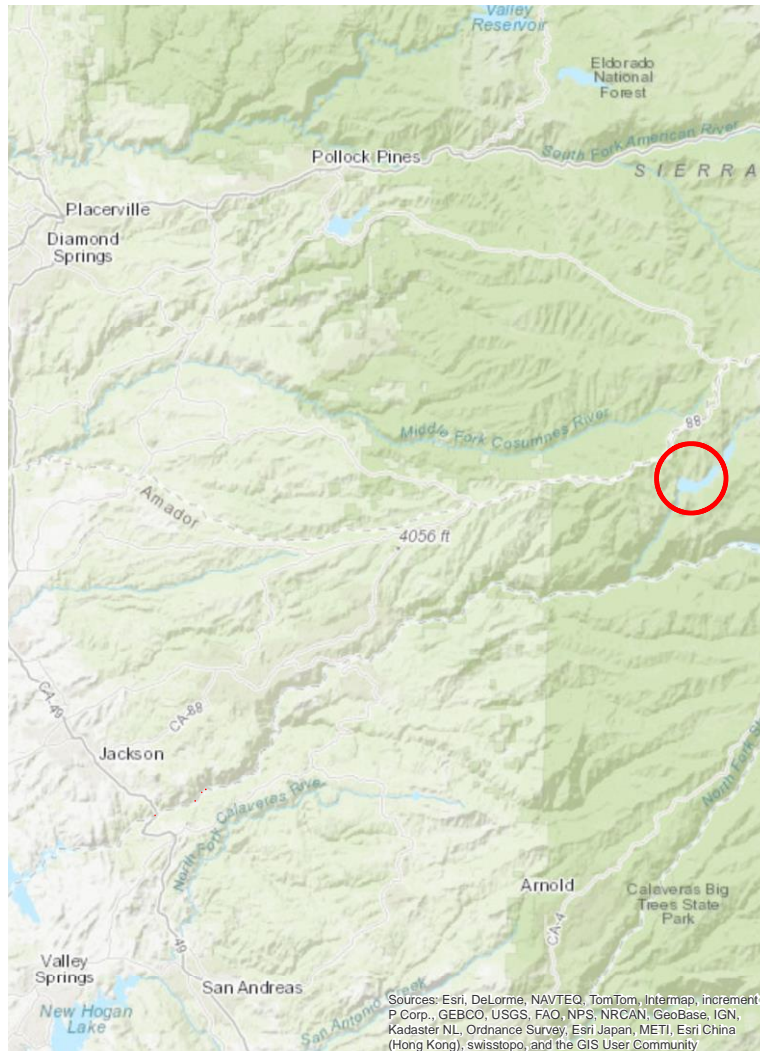


Figure 1. Lower Bear River Reservoir (Amador County).

There are two angler survey boxes (ASB) at Lower Bear. One is located at the main boat launch at the Bear River Lake Resort while the second is by the west side of the outlet dam (Figure 2). Campgrounds and cabins are located around the reservoir, which makes Lower Bear ideal for multi-day usage.

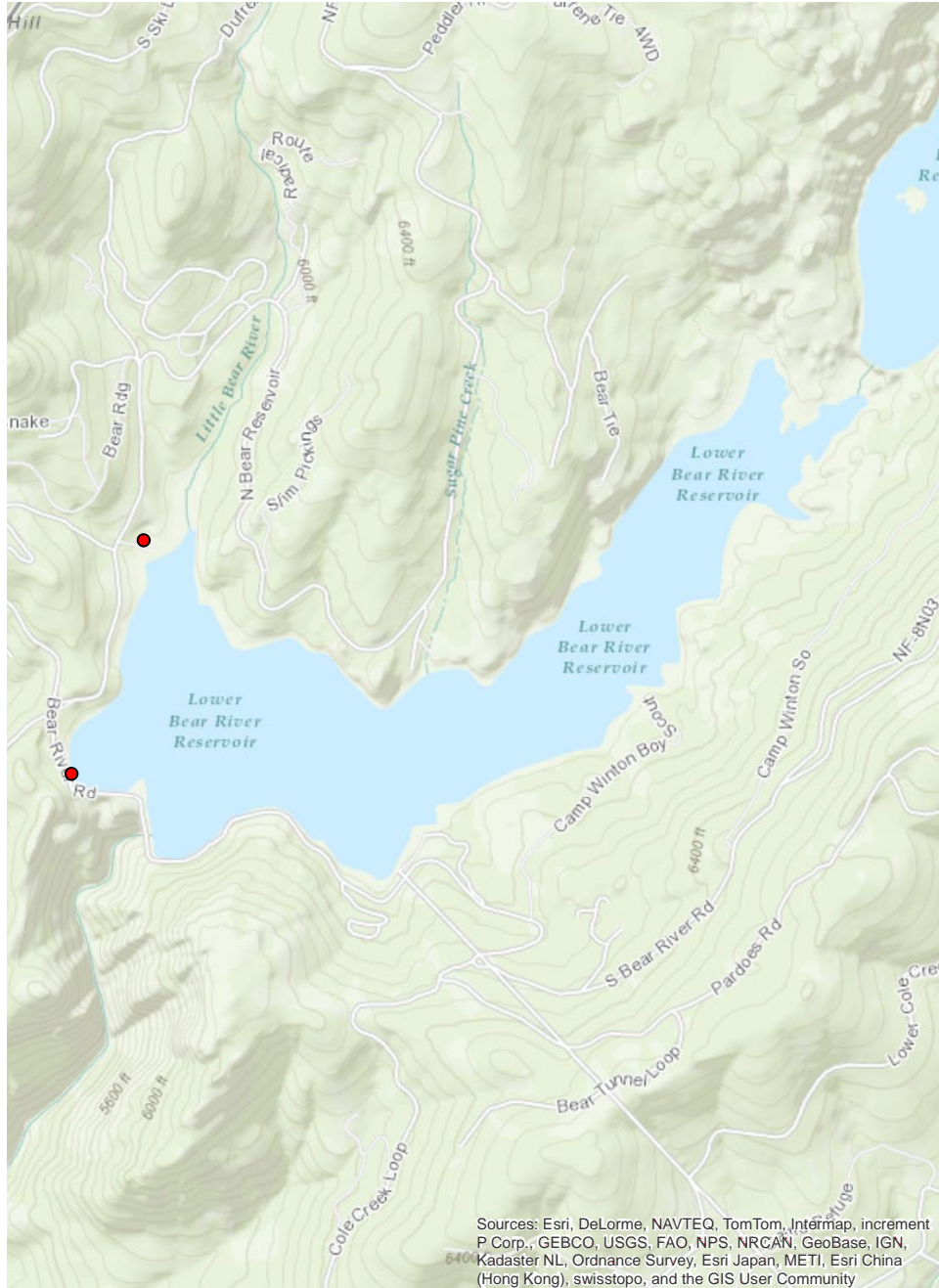


Figure 2. Lower Bear River Reservoir ASB locations (Amador County).

In addition to fishing, the area surrounding Lower Bear supports recreational activities including hiking, hunting, boat and all-terrain vehicle rentals, 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), rainbow trout (*Oncorhynchus mykiss*) (RT), and lake trout (*Salvelinus namaycush*) (LT). Lower Bear is regularly stocked by California Department of Fish and Wildlife (CDFW), PG&E, and the Bear River Lake Resort, with trout ranging in size from fingerling (2.5 to 5 inches) to trophy (> 18 inches).

Methods

Anglers were asked to fill out a voluntary 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, anglers were asked 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 included space for anglers to provide any additional comments. The 2012 and 2013 data used for comparison in this report was gathered using the roving creel survey (RCS) technique (Hickey 2013 and Richardson 2014). The 2015 – 2017 data were collected via ASB.

Results

In 2017, the number of anglers and number of fish reported caught was more than in 2015, but less than any other previous survey. In 2017, 13 anglers responded to the ASB form. In 2016, 35 anglers responded while only five anglers responding in 2015 (Table 1). The five-year survey average, including anglers who responded to the 2012 and 2013 roving creel surveys was 207 (Hickey 2013 and Richardson 2014) (Table 1). Cumulatively, these anglers landed an average of 157 fish annually and averaged 569.7 hours of fishing. Average catch per hour for the five-year average was 0.38. The catch per angler increased from a pre-2017 average of 1.12 to 3.46 in 2017. The catch per hour also increased from a pre-2017 average of 0.31 to 0.66 in 2017.

Table 1. Collection of average effort and catch statistics recorded from the roving creel surveys in 2012 - 2013 and the 2015 - 2017 angler survey box at Lower Bear River Reservoir, Amador County.

<u>Year</u>	<u>Respondents</u>	<u>Hours Fished</u>	<u>Fish Landed</u>	<u>Catch per Hour</u>	<u>Catch per Angler</u>
2012	447	1176.2	247	0.21	0.55
2013	533	1433.5	408	0.28	0.77
2015	5	25.0	4	0.16	0.80
2016	35	146.0	83	0.57	2.37
2017	13	68.0	45	0.66	3.46
Average	207	569.7	157	0.38	1.59

In 2017, for the first time in the five years’ of surveys, the gear method that caught the greatest number of fish was lures (n = 33) (Table 2). In 2016 and 2012, bait anglers caught the

greatest number of fish (2016, n = 50; 2012, n = 180). In 2015 and 2013 multiple gear types caught the greatest number of fish (2015, n = 4; 2013, n = 189) (Table 2). No anglers reported fishing using multiple gear types or flies in 2017.

Table 2. The number of fish landed by the type of gear used from 2012 -2013 (Creel method) and 2015 - 2017 (Angler Survey Box method).

Angling method	2012	2013	2015	2016	2017
Bait	180	160	0	50	7
Lure	14	53	0	12	33
Fly	4	6	0	6	0
Multiple	49	189	4	5	0
Not recorded	NA	NA	NA	10	5
Total	247	408	4	83	45

Twenty-three RT caught in 2017 were in the 10.0 – 11.9 inch length class, which was also the length class with the greatest number (Figure 3). In comparison 31 RT caught in 2016 were in the 6.0 – 7.9 inch length class, which was the length class with the greatest number (Figure 3). Two BK caught in 2017 were in the 6.0 – 7.9 in. length class, which also was the length class with the greatest number. The 2012 – 2013, and 2015 length classes of fish caught at Lower Bear can be found in the 2013 and 2015 survey studies (Richardson 2014, Ewing 2016).

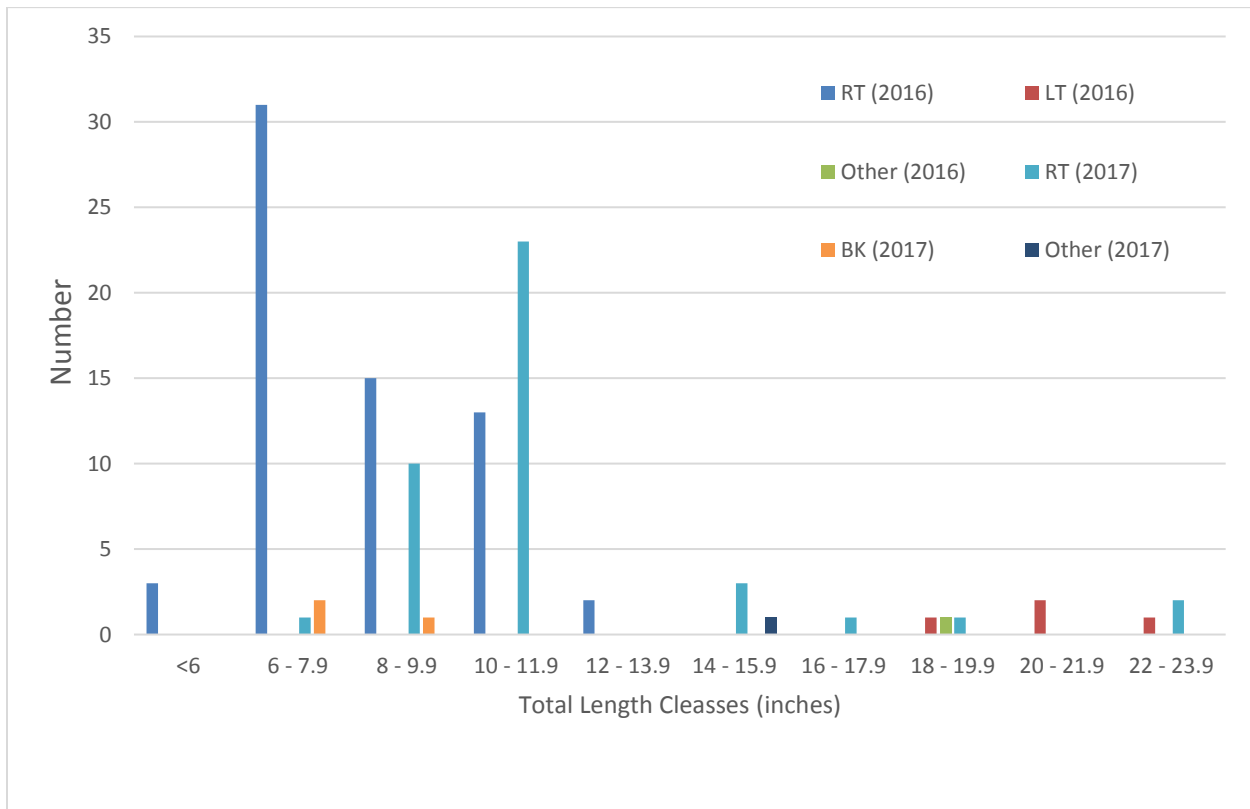


Figure 3. Frequency of measured fish in each size class that anglers reported landing at Lower Bear River Reservoir (2016 – 2017).

One angler (7.7%) reported no specific method of fishing, which resulted in the best success in terms of catch per angler (5.00) in 2017 (Table 3). Shore fishing was the most popular method of fishing in 2017 (n = 8) and had a 2.88 catch per angler value. Four anglers (30.8%) reported fishing from boat, which resulted in the highest success for an identified method of angling (4.25 catch per angler). No anglers recorded float tubing as a method of fishing.

Table 3. Number of anglers and catch per angler based on angling method at Lower Bear River Reservoir, 2017.

Method	Number of Anglers (%)	Catch per Angler
Not Recorded	1 (7.7 %)	5.00
Boat	4 (30.8 %)	4.25
Shore/Wading	8 (61.5 %)	2.88
Float Tube	0 (0.0 %)	NA

In 2017, anglers reported being satisfied with their overall angling experience, size of the fish, and the number of fish caught (Table 4). This is the first time in the three years’ of ASB surveys 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 - 2017 (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

Discussion

The 2017 Lower Bear ASB results indicate anglers had the highest catch per angler rate compared to any prior years. Overall catch in 2017 was the second lowest in the five years’ worth of surveys. CPUE in 2017 was greater than any other survey year. This increase may be the result of the larger allotment of catchable-size RT stocked in Lower Bear in 2017 compared to 2016 and 2015. It is also possible the fish caught were from the large RT fingerling stocking from 2015, which grew into larger-size classes. It is also possible that the low number of responses to the ASB survey disproportionately represented the more successful anglers. Since CDFW surveyed hundreds of people each year with the roving creel and only a few dozen with the ASB, the roving creel may have captured a more diverse group of fishing experiences.

The 10.0 – 11.9 inch length size class had more RT than any other length class in 2017. These fish may have been the 2016, 6.0 – 7.9 inch length size class, which had more RT than any other that year. Some of these RT may also have been the sub-catchable RT stocked in 2015. This may correspond to why anglers were more satisfied with the “size” compared to any previous year since it is likely anglers would prefer catching 10 inch RT compared to 6 inch. Anglers were satisfied with the number of fish they caught for a second straight year. Both the size and number satisfaction numbers increased from 2015 to 2017.

The overall fishing experience in 2017 for anglers was positive for the first time in three years and third time in five survey years. It appears clear why the overall angling experience was positive in 2017, since the number of fish and size of the fish had record high values.

The number of respondents in the 2017 survey was down from 2016, but higher than the number of respondents in the 2015 survey. Ideally, the more respondents, the more feedback the ASBs provide CDFW on angler success at the fishery. It is essential CDFW maintain the trend of increasing angler participation in the ASB survey, partly because these surveys provide information on complete fishing trips. In addition, CDFW staff should continue to inform anglers of the ASB locations at Lower Bear, and emphasize how helpful their responses and participation in the survey are.

CDFW, PG & E, and the Bear River Lake Resort stock RT at Lower Bear (Appendix 1). 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 implementing a put and grow strategy with the sub-catchable RT, but it is not known how many of these fish grow to catchable size. Losee and Phillips (2017) found that RT in the 14 - 15 inch 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 hatchery RT due to the presence of large, predatory BN and LT in Lower Bear. CDFW staff will likely move to a trophy-trout fishery (1 lb. and larger stocked RT) in 2018 in order to help survivability of RT planted in Lower Bear.

Lower Bear has a history of growing large RT, LT, and BN in the trophy-size length classes. Two trophy-size RT and no LT were recorded in 2017. Only four LT were recorded in the 2016 survey, with no trophy-size RT, even though Bear River Lake Resort has stocked trophy-size RT the past three years. 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). Lower Bear has a lot of boulder and bedrock structure with a steep gradient along its shoreline. This allows shore anglers access to deep water for fishing. Being able to fish this deeper water from shore means boat anglers are not the only ones able to fish greater depths.

Only four BN have been reported caught in five years' of surveys. The last stocking of 15,000 fingerling-size BN in 2012 does not appear to be successful from the data collected. It is also possible that the smaller percentage of BN in Lower Bear are trophy-size and eating

many of the RT resulting in fewer RT in the larger size classes. Wiley et al. (1993) noted that larger trout are better able to avoid predators. This same hypothesis could be also happening in Lower Bear.

It was easier to identify any overlying trends since the 2017 survey method was the third consecutive season of the ASB at Lower Bear. Hopefully more anglers will fish Lower Bear and fill out the survey forms since the number of respondents declined from 2016.

Recommendations

- Continue to survey Lower Bear using ASB procedures to form a standardized survey method of collecting data for and capturing trends and/or gathering year-to-year comparisons.
- Switch to stocking trophy-size RT.
- Educate the public and anglers about ASBs and their locations at Lower Bear.

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Appendix 1. Stocking history at Lower Bear River Reservoir in 2015 - 2017.

Date	Species	Weight (lbs.)	Number	Agency
2017	RT	1,000		Bear River Lake Resort
7/31/2017	RT	1,000	2,900	CDFW
6/26/2017	RT	1,000	2,700	CDFW
5/22/2017	RT	1,500	6,300	CDFW
5/17/2017	RT	1,500	3,000	PG & E
5/27/2016	RT	350	525	CDFW
5/27/2016	RT	200	600	CDFW
5/27/2016	RT	450	1,530	CDFW
7/18/2016	RT	510.5	2,195	CDFW
5/18/2016	RT	1,500	3,000	PG & E
2016	RT	1,000		Bear River Lake Resort
2015	RT	1,500	3,000	PG & E
2015	RT	1,000	2,000	Bear River Lake Resort
6/30/2015	RT	1,070	50,076	CDFW
6/22/2015	RT	1,800	4,680	CDFW
5/4/2015	RT	500	850	CDFW
5/4/2015	RT	1,500	2,700	CDFW