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

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

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Introduction

Lower Bear River Reservoir (Lower Bear) in Amador County is located in the El Dorado National Forest off Highway 88 (Carson Pass) and approximately 40 miles east of Jackson (Figure 1). This reservoir is divided by a dam creating upper and lower lakes, where Upper Bear is much more isolated and requires a significant hike, a boat ride, or access through an adjacent boy scout camp to get to. This results in the Lower Bear receiving the majority of the fishing pressure. Lower Bear covers an area of 710 surface acres with approximately nine miles of shoreline and an elevation of 5,824 feet above mean sea level (Ca. Dept. of Water Resources (DWR) 2012). The storage capacity for Lower Bear is 48,750 acre feet of water that is managed by Pacific Gas and Electric (PG&E) for hydroelectric uses (DWR 2012).

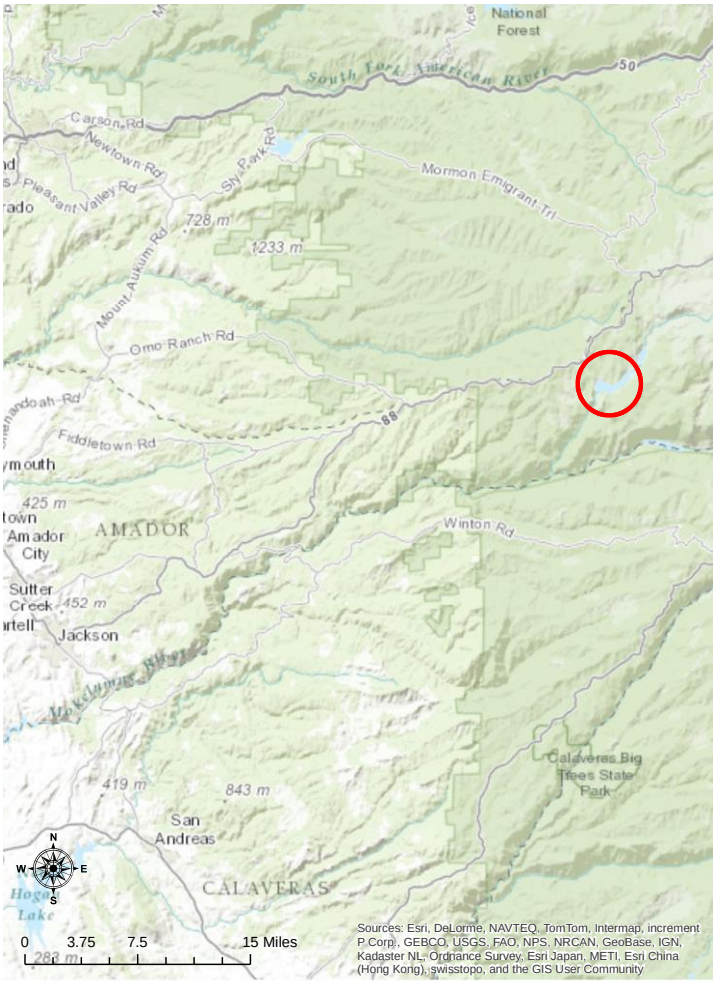

Figure 1. Lower Bear River Reservoir (Amador County).

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 other is by the west side of the outlet dam (Figure 2). Campgrounds are located around the reservoir which makes Lower Bear ideal for multi-day usage.

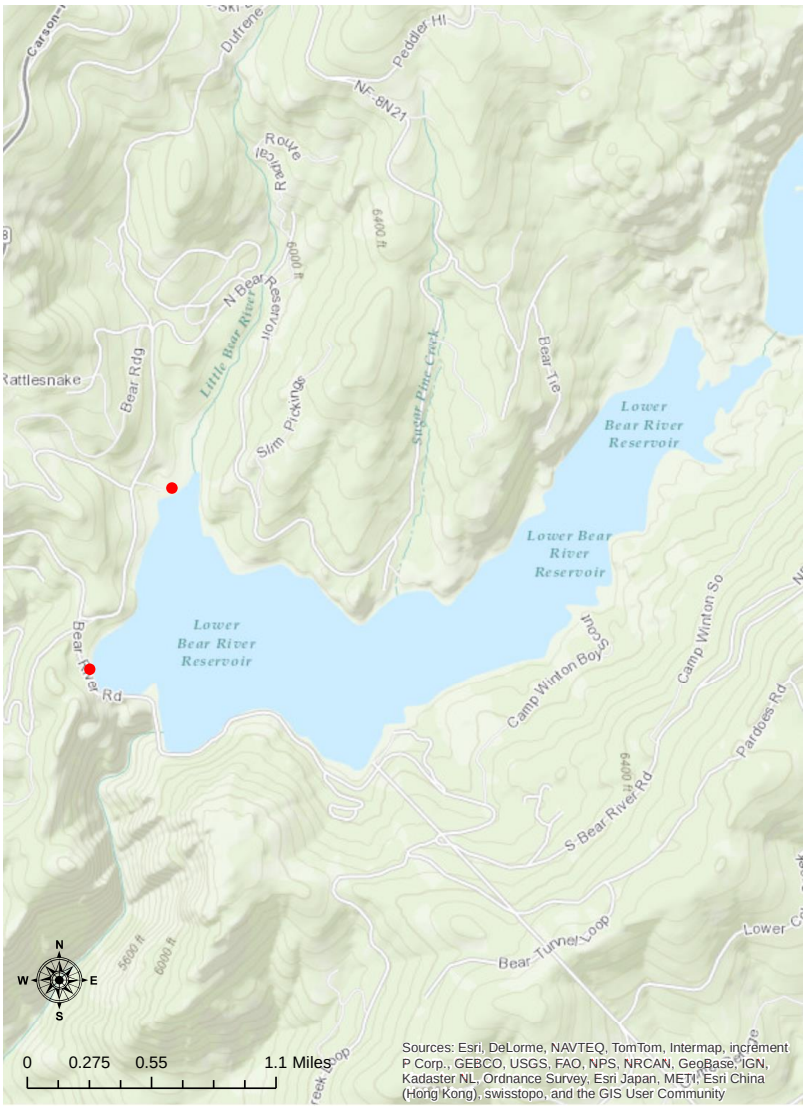

Figure 2. Lower Bear River Reservoir ASB locations.

In addition to fishing, the area surrounding the reservoir supports recreational activities including hiking, boat and ATV 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. This lake is a well-known trout fishery containing brown trout (*Salmo trutta) (*BN), rainbow trout (*Oncorhynchus mykiss) (*RT), and lake trout (*Salvelinus namaycush)* (LT). Stocking events occur regularly 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, type of gear used, and the number and type of landed fish. They were also asked the size and species of the fish landed and whether they kept or released their catch. Finally, anglers were asked three questions, and their answers were recorded on a scale of -2 to 2, with "2" representing most satisfied and "-2" representing least satisfied. The questions pertain to satisfaction of overall angling experience, size and number of fish. The back of the survey form is reserved for anglers who have 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).

Results

In 2015, a total of five anglers responded to the survey. The three year average, including anglers who responded to the 2012 and 2013 roving creel surveys was 328 (Hickey 2013 and Richardson 2014) (Table 1). Cumulatively, these anglers landed an average of 219 fish annually and averaged 878.23 hours of fishing (0.22 fish/hour). The catch per angler increased from a 0.66 2012 and 2013 average to 0.80 in 2015. However, the catch per hour decreased from 0.21 and 0.28 in 2012 and 2013 to 0.16 in 2015.

Table 1. Collection of average effort and catch statistics recorded from the roving creel surveys in 2012 and 2013 and the 2015 ASB survey at Lower Bear River Reservoir.

Year	Respondents	Hours Fished	Fish Landed	Catch per Hour	Catch per Angler
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
Average	328	878.23	220	0.22	0.71

In 2012, the method of take that caught the greatest number of fish in was bait (73%). In 2013 and 2015 multiple gear types caught the greatest percentage of fish (46% and 100%) (Table 2). The least frequent or equal finish for the least frequent gear used all three years was the fly (2%, 2%, and 0.0 %), respectively.

Table 2. The number of fish landed by the type of gear used from 2012 -2013, and 2015.

Angling method	2012	2013	2015
Bait	180	160	0
Lure	14	53	0
Fly	4	6	0
Multiple	49	189	4
Total	247	408	4

In 2015, the number of anglers and number of fish reported caught was less than the two previous surveys. With only four fish reported caught in 2015, no length-frequency histogram was made comparing the total length measurements to prior years. Two RT were caught in 2015, one in the 8.0 – 9.9 in. length class and one in the 10.0 – 11.9 in. length class. Two LT were caught in 2015, one in the 6.0 – 7.9 in. length class and one in the 12.0 – 13.9 in. length class. The 2012 and 2013 length classes of fish caught at Lower Bear can be found in the 2013 survey study (Richardson 2014).

In 2015, anglers reported being very unsatisfied with their overall angling experience, size of the fish, and the number of fish caught (Tables 3). The majority of anglers in both 2012 and 2013 had a satisfactory overall angling experience. The majority of anglers in 2012 reported not being satisfied with the size and number of fish caught (Table 4). In 2013, anglers were satisfied with the size and number of fish caught.

Table 3. Angler Satisfaction Response Averages for the Lower Bear River Reservoir Fishery from 2015(Angler Survey Box)(Based on -2 to 2 Rating Scale).

Overall Angling Experience	Size of the Fish	Number of Fish
-0.75	0.00	-0.67

Table 4. Percentage Satisfaction Averages for the Lower Bear River Reservoir Fishery from 2012 and 2013 (Creel-based surveys) (Based on Yes or No Satisfaction Question).

Year	Overall Angling Experience	Size of the Fish	Number of Fish
2012	83.2%	30.2%	29.5%
2013	83.6%	62.3%	70.9%

Discussion

The data gathered from Lower Bear ASB has shown anglers to have caught less than one fish per day on average which is poor and consistent with prior years. Overall catch and CPUE in 2015 was the lowest in the three years' of surveys (n=4) (0.16 fish/hour). The decrease could be attributed to the large decrease in trout planted in Lower Bear in 2015 and/or decrease in

reservoir level due to the multi-year drought, not knowing about the ASB, or feeling like filling out the survey.

No one length size class had more fish than another in 2015. The smallest and largest fish were LT with sizes ranging from a 6.0 – 7.9 in. to 12.0 – 13.9 in. This corresponds with anglers being neutral with a "0" average for "size" satisfaction. Anglers were not satisfied with the number of fish they caught (-0.67 average) in 2015. Both the size and number satisfaction numbers are down from prior years.

The overall fishing experience in 2015 for anglers was negative for the first time in three years. Two reasons anglers could have been unsatisfied is the low catch rate and lack of trophy-size fish caught. After a complete trip anglers caught less than a fish per angler.

The number of respondents in the 2015 survey was five, which is a low number for an ASB. Ideally, the more respondents, the more feedback it provides CDFW on angler success at the fishery. It is likely that there were a lot of anglers who didn't feel like filling out a survey or didn't see the ASB. Novinger (1990) reported that anglers probably underreported harvest of subslot largemouth bass (*Micropterus salmoides*) when asked to voluntarily fill out catch cards. It is essential CDFW maintain the trend of increasing angler participation in the ASB survey, as it provides information on complete fishing trips. CDFW staff should continue to notify anglers of the ASB locations at Lower Bear, and how helpful angler participation in the survey is.

CDFW, PG & E, and the Bear River Lake Resort plant Lower Bear (Appendix 1). Rainbow trout are planted by all three entities. The sizes of fish planted included fingerling, sub-catchable, and catchable fish. Fingerling and sub-catchable trout are stocked under a put and grow management strategy while catchable 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. CDFW staff could better evaluate the success of stocked sub-catchable RT by clipping the fins of all stocked trout prior to release in order to identify them in future surveys and get a better estimation of their yearly growth.

Lower Bear has a history of growing large RT, LT, and BN in the trophy-size length classes, but these fish were not found in this year's survey and can be difficult to get information on. 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 rock structure with steep gradient. Shore anglers have a lot of shore access available with access to deep water for fishing. Being able to fish this deeper water from shore means boat anglers aren't the only ones able to fish greater depths.

Brown trout are present in Lower Bear, but only four have been reported caught in three years of surveys. It is 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. CDFW electrofishing surveys found that when large, piscivorous northern pike (*Esox lucius*) inhabited Lake Davis (Plumas County, CA) that more trophy-sized RT were caught compared to when the pike were removed (Rossi, Pers. Comm. 2016). It was thought that only larger-sized RT could survive in Lake Davis with the pike and that the smaller-size RT were being eaten.

It is difficult to identify any overlying trends since the 2015 survey method was different from prior years as well having few angler respondents. It is possible more anglers will fill out the survey forms in the future since many anglers may have not been aware of the recent installation and locations of the ASBs in 2015.

Recommendations

- CDFW staff should install a species identification board on the ASB and/or kiosk at Bear River Lake Resort, in order to minimize species misidentification by anglers.
- Continue to survey Lower Bear using ASB procedures in order to form a standardized survey method of collecting data and capture trends and/or gather year to year comparisons.
- Mark all trout less than catchable size in order to identify whether survivability is a significant issue for these small trout.
- Continue stocking efforts 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. 2012. http://cdec.water.ca.gov/cgi-progs/stationInfo?station_id=LWB

3. 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. Unpublished.

4. Novinger, G. D. 1990. Slot length limits for largemouth bass in small private impoundments. North American Journal of Fisheries Management 10:330-337.

5. 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. Unpublished.

6. Rossi, Amber. 2016. California Department of Fish and Wildlife. Personal Communication.

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

Date	Species	Weight (lbs.)	Number	Agency
2015	RT	1500	3000	PG & E
2015	RT	1000	2000	Bear River Lake Resort
6/30/2015	RT	1070	50,076	CDFW
6/22/2015	RT	1800	4680	CDFW

5/4/2015	RT	500	850	CDFW
5/4/2015	RT	1500	2700	CDFW