

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

**Red Lake, Alpine County**

**2011-2015 Angler Survey Box Analysis**



**Ben Ewing  
Environmental Scientist**

**January 2016**

## Introduction

Red Lake is an 85 acre reservoir in Alpine County that is situated at approximately 7800 feet above mean sea level. It is located off Highway 88, roughly one mile south of the Carson Pass and about 25 miles south of Lake Tahoe. Red Lake drains into Red Lake Creek, which is a five mile creek that flows into the West Fork Carson River. Red Lake is open all year to the public with a five trout bag limit with 10 in possession.

Red Lake is annually stocked, since 1968, by the California Department of Fish and Wildlife (CDFW) for recreational fishing. Historically, Red Lake was a brook trout (*Salvelinus fontinalis*, BK) fishery, however in 2011; CDFW shifted the fishery to native Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*, LCT). This change was motivated by a state legislative action which aimed to create more fishing opportunities for native fish. CDFW stocks sub-catchable LCT in addition to catchable brood stock LCT from Heenan Lake (Appendix 1). Along with LCT and BK, Red Lake currently supports populations of non-game fish such as Tahoe suckers (*Catostomus tahoensis*), mountain suckers (*Catostomus platyrhynchus*) and Tui chub (*Gila bicolor*).

In order to assess the fishery, approximately 20 years ago CDFW installed two angler survey boxes (ASB) at the lake. One was installed just west of the parking lot and the other on the west side of the dam near the mouth of Red Lake Creek. Anglers voluntarily fill out a survey sheet after they complete their fishing trip, and deposit it in the box. CDFW uses the data collected to assess angler satisfaction, species composition, and general angler statistics at the lake. This report covers the data collected from Red Lake's ASB from 2011-2015.

## Methods

Anglers were asked to fill out a voluntary survey form about their fishing. The survey asks anglers for information regarding hours fished, type of gear and method used and the number of landed trout. They were also asked the size and species of the trout 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.

## Results

In 2015, Red Lake had 66 respondents which was above the average of 51 (37-66) anglers who responded to the survey (Table 1) and the highest in the five year survey period. Cumulatively, these anglers landed a total of 176 fish and logged 220.25 fishing hours in 2015 which is also above the five year average of 167 hours and 160 fish landed. The catch per angler and catch per hour in 2015 of 2.67 and 0.80 decreased from the average of 3.11 and 0.96 respectively over the five year period.

Table 1. Collection of average effort and catch statistics recorded from the ASB 2011 - 2015 at Red Lake.

Year	Respondents	Hours Fished	Fish Landed	Catch per angler	Catch per hour	Hours per angler
2011	37	141.13	98	2.65	0.69	3.81
2012	51	159.75	166	3.25	1.04	3.13
2013	61	181.5	224	3.67	1.23	2.98
2014	41	132	136	3.32	1.03	3.22
2015	66	220.25	176	2.67	0.80	3.34
Average	51	167	160	3.11	0.96	3.30

A total of 58 anglers (87.9%) reported fishing from shore or by wading, which resulted in the second best success in terms of catch per angler (2.74 fish/angler) in 2015 (Table 2). It was also the most popular method of fishing in 2015. The least used method in 2015 was float tube fishing, which had the least catch per angler at 0.00. Five anglers failed to record their fishing method but their catch per angler was the highest with 2.80 fish/angler.

Table 2. The number of anglers and catch per angler based on angling method at Red Lake.

Method	2011 - 2014		2015	
	Number of Anglers (%)	Catch per Angler	Number of Anglers (%)	Catch per Angler
Boat	16 (8%)	2.38	2 (3.0%)	1.50
Float Tube	25 (13%)	3.92	1 (1.5%)	0.00
Shore or Wading	142 (75%)	3.04	58 (87.9%)	2.74
Not recorded	7 (4%)	4.00	5 (7.6%)	2.80
Total	190		66	

Anglers used bait, lures, and flies while fishing in Red Lake (Table 3). In 2015, 48 anglers (72.7%) used bait to catch trout, which was an increase from the 2011 – 2014 average of 40.3%. The least frequent method in 2015 was the fly method (1.5%) which decreased from the 2011 – 2014 average of 8.4%. Bait anglers had the highest catch rate of 3.17 fish per angler in 2015, which was higher than the 2.38 catch per angler average for 2011 – 2014. Lure method anglers had the second highest catch rate at 1.45 fish per angler in 2015, which is a large decrease from the 3.63 catch per angler average for 2011 – 2014. Fly anglers caught the least fish at 0.00 fish per angler, a large drop from the 2011-2014 average of 6.31 fish per angler.

Table 3. The frequency of anglers that used each angling method and their corresponding catch rates from 2011 - 2015.

Angling method	2011 - 2014		2015	
	Number of anglers	Catch per angler	Number of anglers	Catch per angler
Bait	77 (40.3%)	2.38	48 (72.7%)	3.17
Lure	54 (28.3%)	3.63	11 (16.7%)	1.45
Fly	16 (8.4%)	6.31	1 (1.5%)	0.00
Multiple	40 (20.9%)	2.78	4 (6.1%)	0.75
Not recorded	4 (2.1%)	1.00	2 (3.0%)	2.50
	191		66	

In 2015, anglers managed to catch more fish (n=176) than every year except 2013, in which 224 were reported caught (Figure 1). In 2011, 69% of trout landed were LCT while only 29% were BK. By 2013, anglers reported catching a higher percentage (55%) of BK than LCT (45%). In 2014, 66% of the fish landed were LCT and 13 % were BK. In 2015, 64% of identifiable trout landed were LCT, 8% were BK, 24% percent were unidentifiable trout, and three percent were other. Brown trout only showed up in 2011 when anglers reported catching two BN, one in the 10-11.9” size class and one in the 14-15.9” size class. The reported catch rates correspond with stocking records as only LCT have been planted in Red Lake since 2011 by CDFW. No BK were caught during the 2013 roving creel survey but one rainbow trout (*Oncorhynchus mykiss*) and one mountain whitefish (*Prosopium williamsoni*) were caught (Onanian 2014).

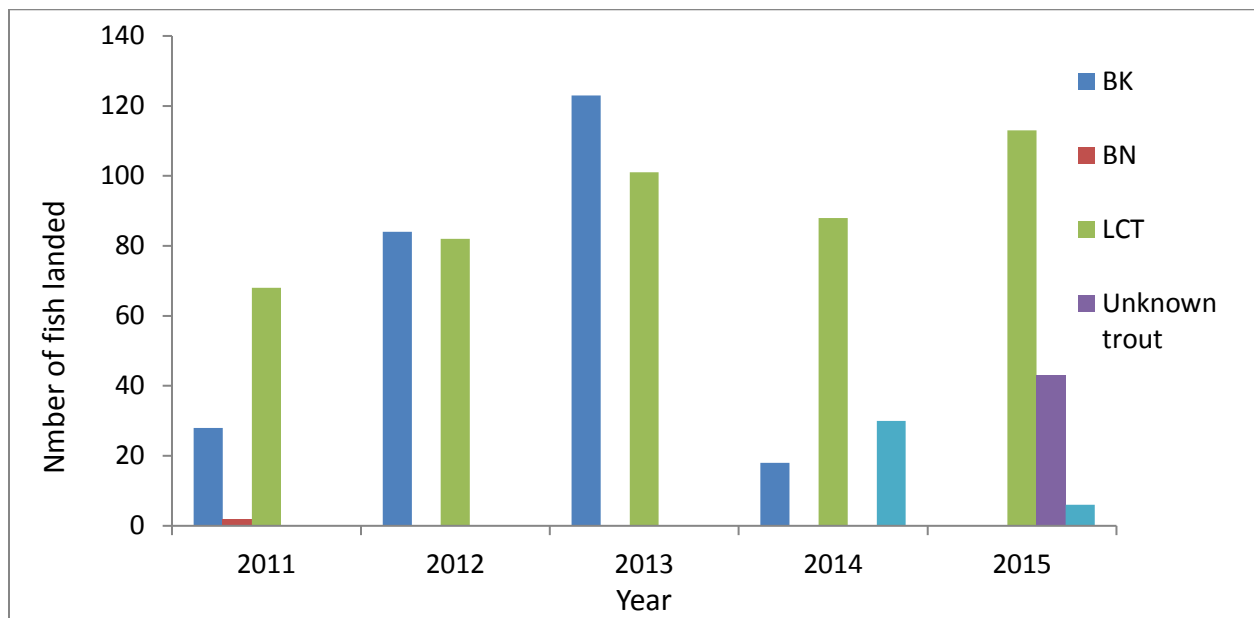


Figure 1. Number of each species of fish caught annually from 2011 through 2015 at Red Lake.

The 2011 – 2014 ASB data showed that 72% (428 fish) of the landed trout measured less than 10 inches in total length (Figure 2) which decreased to 24% of the total in 2015. Only eight percent of

landed trout measured between 12 and 20 inches from 2011 - 2014, but increased to 54% in 2015. Only three and two percent of trout caught were greater than 20 inches in 2011 – 2014 and 2015, respectively.

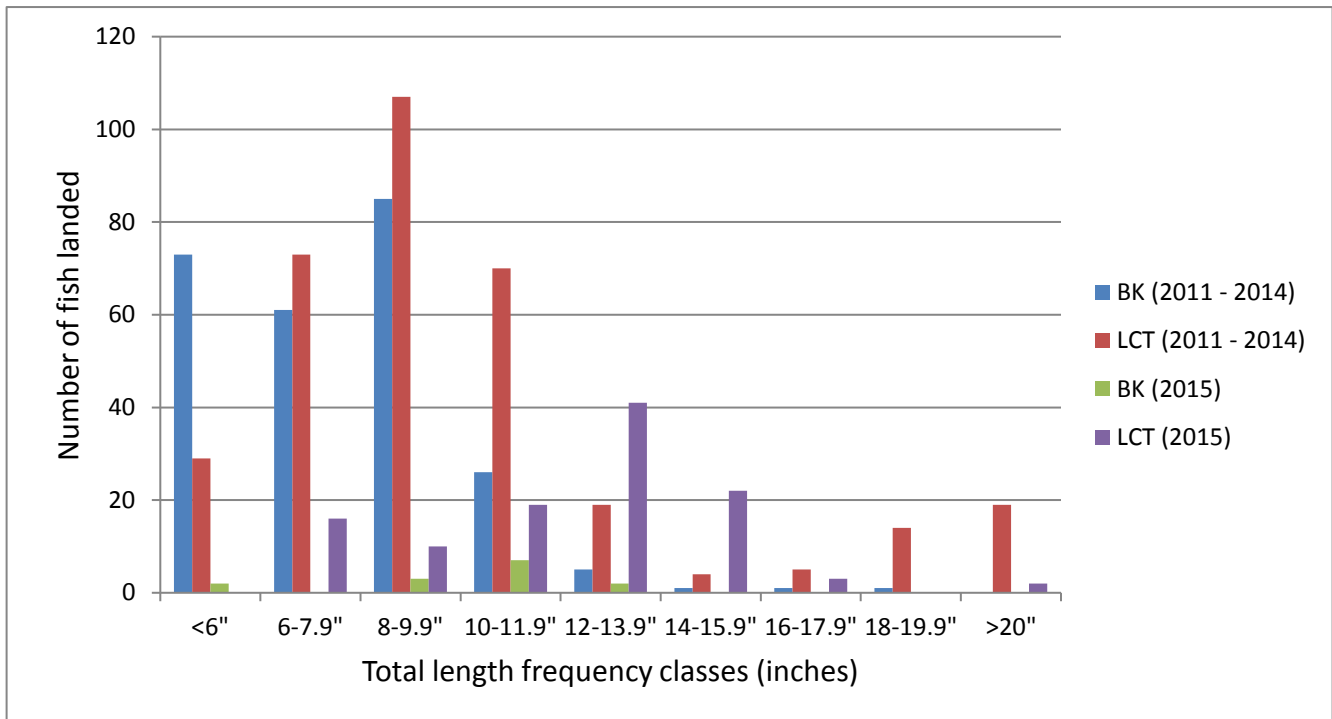


Figure 2. Frequency of identified trout in each size class that anglers reported landing on Red Lake from 2011-2015.

2011 – 2014 ASB data showed that although more LCT have been caught than BK, the percentage of released of each species is the same (71%) (Table 4). In 2015, 50% of the BK were released compared to only 12% of LCT released.

Table 4. Data on kept and released trout in Red Lake between 2011 and 2015.

Year	Species	Kept	Released	Total Caught	Percent of total catch	Percent released
2011-2014	BK	74	182	256	42.5	71.1
	LCT	99	245	344	57.1	71.2
	BN	0	2	2	0.0	100.0
		173	429	602		
2015	BK	7	7	14	8.2	50.0
	LCT	99	14	113	66.5	12.4
	Unknown trout	43	0	43	25.3	0.0
	Other	NA	NA	6	3.4	NA
		149	21	176		

In 2015, anglers reported being less satisfied with their overall angling experience than in 2013 and 2014, but was an increase from both 2011 and 2012 (Tables 5). Anglers had a positive average angling experience response all five years which is an indication that the fishery provides an above satisfactory experience. This is consistent with what the roving creel survey provided (Onanian 2014). Anglers were satisfied with the size of the trout for the first time in five years. When reporting their satisfaction with the number of fish, anglers were satisfied with the number of fish caught, which in 2015 was the highest level of satisfaction over any previous year.

Table 5. Angler satisfaction response averages for the Red Lake fishery from 2011 through 2015.

Year	Overall angling experience	Size of the fish	Number of fish
2011	0.28	-0.33	-0.14
2012	0.34	-0.42	-0.15
2013	0.73	-0.16	0.49
2014	0.54	-0.16	0.38
2015	0.50	0.52	0.50

## Discussion

The data gathered from the Red Lake ASB has shown anglers to have caught over three fish on average when fishing at Red Lake the last five years. Overall catch in 2015 was the second highest (n=176) in five years but CPUE was decreased from 3.32 in 2014 to 2.67 fish per angler in 2015. It is possible the higher number of trout was a function of greater number of anglers reported fishing. The decrease in CPUE can be attributed to the reduced LCT stocking in 2013 - 2014 that resulted from losses of LCT during hatchery production. The 2013 season with the greatest catch rates and satisfaction resulted from the 2012 LCT stocking that included a substantial number of sub-catchable and fingerling fish. The greatest percentage of anglers fished from the shore and had the greatest catch per angler in 2015. The low water level in Red Lake in 2015 might have increased shoreline access that normally isn't available when the water level is higher, thus helping anglers target fish easier.

The greatest number of trout caught in 2015 were in the 12 - 13.9 in. size class. This corresponds with the highest satisfaction of anglers with the "size" of their catch. Prior to 2015, anglers were never satisfied with the size of trout they were catching. It is possible that the decrease in fish plants over the years has decreased competition for food, thus allowing the LCT in Red Lake to grow to larger sizes. The public has been satisfied with the numbers of trout caught the last three years. CDFW has been putting allotments of broodstock (2lbs) LCT from Heenan Lake into Red Lake. However anglers are not reporting catching many of these larger fish, as only 21 LCT over 20 inches were caught and reported in the last five years. CDFW creel clerks have reported seeing numerous trout in the 1 to 5 pound range swimming down Red Lake Creek when the water is high. The broodstock LCT could potentially be swimming downstream after they are planted, due to the fact that they are planted during spawning season. CDFW could monitor the creek after they plant the large LCT to document how many of them are swimming out of Red Lake and into Red Lake Creek. It is often difficult to manage a fishery to satisfy both high catch rates and large size of fish caught but in 2015 it was

accomplished for the first time in five years. A potential way to foster growth would be to decrease the number of sub-catchable fish planted compared to previous years, as to reduce competition for resources as well as continued harvest of fish.

2011 – 2014 ASB data showed that although more LCT were caught than BK, the percentage released of each species is the same (71%) (Table 4). In 2015, 50% of the BK were released compared to only 12% of LCT released. This is likely because of the relatively small sizes of BK being caught at Red Lake compared to LCT. Unlike creel surveys conducted in the past three years, ASB surveys have shown significantly more LCT caught rather than BK. Historically, Red Lake was a BK fishery, but BK were last stocked into Red Lake in 2010. Red Lake has and continues to receive both LCT sub-catchable when available and Heenan Lake LCT broodstock fish. The continual plants of LCT and discontinuation of BK plants explain the increase of LCT being caught compared to BK.

The overall fishing experience for anglers has been positive at Red Lake every year surveyed. Averages of responses increased over the previous three years, averaging 0.74 in 2013, but have slightly dropped the last two years. One of the reasons anglers are generally satisfied is due to the fact that most anglers are catching fish. After a complete trip anglers caught an average of over three fish per person over the five year average.

The number of respondents in the 2015 survey was the highest in five years. Ideally, the more respondents, the more feedback it provides CDFW with a better idea of angler success at the fishery. It is essential CDFW maintain the trend of increasing angler participation in the ASB survey, as it provides information on complete fishing trips and helps inform management decisions on the fishery. CDFW staff should continue to notify anglers of the ASB at Red Lake, and how helpful angler participation in the survey is.

## **Recommendations**

- CDFW staff should install a species identification board on the ASB or kiosk at Red Lake, in order to minimize species misidentification by anglers.
- After stocking the large LCT broodstock, a barrier should be placed at the inlet of Red Lake Creek to prevent downstream migration of large LCT during spawning season.
- Creel clerks should continue to encourage fishermen to fill out the ASB forms in future trips, when clerks aren't present. The ABS information should be used to estimate angler CPUE, while the roving-roving surveys should be used to estimate the total number of anglers fishing in Red Lake.
- To maintain satisfaction with the fishery, CDFW should continue to increase the average size of trout in the lake by having lower allotments than previous years. A decreased volume of planted trout could reduce competition for resources and provide more space for the trout to grow.

## **Literature Cited**

Onanian, B. 2014. 2013 Red Lake Creel Survey. California Department of Fish and Wildlife. Fish Files. Unpublished.

Appendix 1. Stocking history at Red Lake since 2011.

Date	Species	Weight (lbs.)	Number	Size
7/18/2011	LCT	201	3015	Sub-catchable
5/18/2012	LCT	378	189	Super-catchable
5/22/2012	LCT	322	161	Super-catchable
6/4/2012	LCT	785	6672	Sub-catchable
6/5/2012	LCT	1,532	13328	Sub-catchable
5/13/2013	LCT	460	5014	Sub-catchable
5/21/2013	LCT	360	180	Super-catchable
5/22/2013	LCT	304	152	Super-catchable
5/29/2014	LCT	218	109	Super-catchable
6/5/2014	LCT	218	109	Super-catchable
6/23/2014	LCT	100	1600	Sub-catchable
5/19/2015	LCT	300	150	Super-catchable