

**State of California  
The Resources Agency  
California Department of Fish and Wildlife  
North Central Region**

**Red Lake, Alpine County**

**2011-2014 Angler Survey Box Analysis**



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## Introduction

Red Lake is an 85 acre reservoir in Alpine County that is situated at approximately 7800 feet in elevation. 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 2011-2014.

## 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

From 2011 – 2014, Red Lake had an average of 48 (37-61) anglers respond to the survey, with a combined total of 190 anglers (Table 1). Cumulatively, these fishermen landed an average of 156 fish and logged 154 fishing hours annually. The average catch per angler and catch per hour over the four years were 3.22 and 1.00 respectively. The catch per angler has increased each year from 2011 to 2013, but in 2014 dropped 11% from the 2013 catch per angler of 3.67. A 2013 roving creel survey conducted by the CDFW indicated that anglers had a 2.05 catch/angler average (Onanian 2014). Likewise, the catch per hour increased from the four year average of 1.00 but decreased 17% from 2013. The catch per

hour is similar to the 0.97 catch per hour seen in the 2013 roving creel survey (Onanian 2014). The number of hours per angler of 3.22 is a slight decrease from the four year average of 3.28. Angler hours were higher than the 2.11 hrs/angler seen in the 2013 roving creel census conducted at Red Lake (Onanian 2014).

Table 1. Collection of average effort and catch statistics recorded from the ASB 2011 - 2014 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
Average	48	154	156	3.22	1.00	3.28

Anglers fished Red Lake from the shore, a boat, or a float tube. A total of 142 anglers (74%) reported fishing from shore or by wading, which resulted in the second best success in terms of catch per angler (3.04 fish per angler). The second most popular method was fishing from a float tube (13% anglers), where anglers had the highest success rate at 3.92 fish per angler. The last method was boat fishing, which had the least catch per angler at 2.38, as well as the lowest use (8% of anglers). Ten anglers failed to record their fishing method.

**Table 1.** The number of anglers and catch per angler based on angling method at Red Lake from 2011-2014.

Method	Number of Anglers	Catch per angler
Shore or Wading	142	3.04
Float Tube	25	3.92
Boat	16	2.38
Not recorded	10	2.80

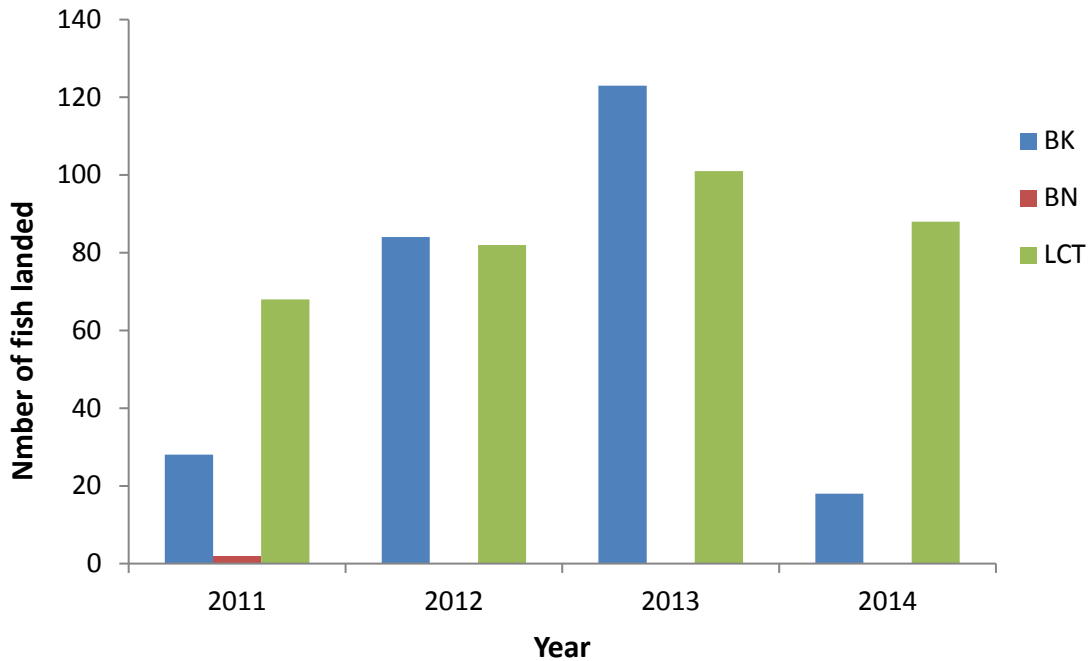
Anglers used bait, lures, and flies while fishing in Red Lake (Table 3). In 2014, 22 anglers (54%) used bait to catch trout, which is an increase from the 2011 – 2013 average of 36%. This is consistent with the percentage of bait anglers in the roving creel survey (Onanian 2014). The least frequent method in 2014 was multiple methods (10%) which decreased from the 2011 – 2013 average of 25%. Fly fishermen had the highest catch rate of 5.43 fish per angler in 2014, which was just a little lower than the 7.00 catch per angler average for 2011 – 2013. Multiple method fishermen had the second highest catch rate at 2.00 fish per angler in 2014, which was fairly consistent with the 2.82 catch per angler

average for 2011 – 2013. Lure fishermen caught the least fish at 1.43 fish per angler, a large drop from the 2011-2013 average of 3.63 fish per angler.

**Table 2.** Frequency of anglers that used each angling method and their corresponding catch rates from 2011-2014.

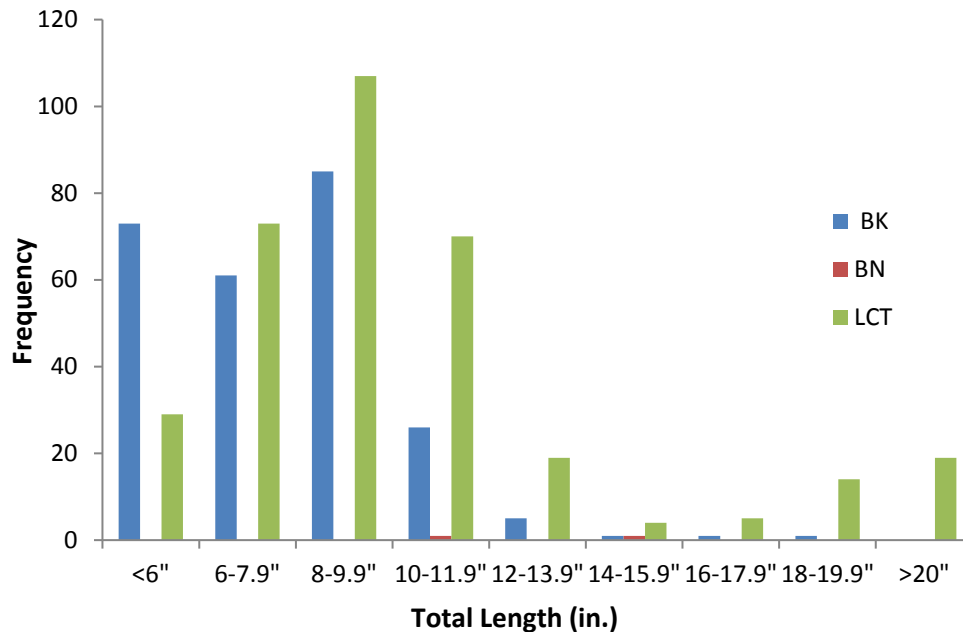
Angling method	Number of anglers	Catch per angler
Bait	77	2.38
Lure	54	3.63
Fly	16	6.31
Multiple	40	2.78
Not recorded	4	1.00

From 2011 to 2013 anglers managed to catch more trout every year but in 2014, the number of trout caught decreased significantly (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, 83% of the trout landed were LCT and 17 % were BK. For the entire period 253 BK and 340 LCT were reported to be captured. BN only showed up in 2011 when anglers reported catching 2 BN in the 10-11.9” and 14-15.9” size classes. 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*). Like what was seen in the 2014 catch, the 2013 roving creel survey indicated the catch was dominated by LCT (Onanian 2014).



**Figure 1.** Number of each species of fish caught annually from 2011 through 2014 at Red Lake.

ASB data showed that 72% (428 fish) of the landed trout measured less than 10 inches in total length (Figure 2) which is consistent with the 2013 roving creel survey in which almost 98% of landed LCT were under 10 inches (Onanian 2014). Only eight percent of landed trout measured between 12 and 20 inches, and only three percent of trout caught were greater than 20 inches. All trout caught over 20 inches were identified by anglers as LCT and caught in the 2013 year. The modal size class for both BK (85 fish) and LCT (107 fish) was in the 8-9.9 inch size class (Table 4). The second highest frequencies were in the 6-7.9 inch size class for LCT and <6 inch size class for BK.



**Figure 2.** Frequency of trout in each size class that anglers reported landing on Red Lake from 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). This is likely because of the relatively small sizes of trout being caught at Red Lake regardless of species. It is possible that the large numbers of fish in Red Lake are competing for food sources that would allow them to grow to larger sizes.

Table 4. Data on kept and released trout in Red Lake between 2011 and 2014.

Species	Kept	Released	Total Caught	Percent of total catch	Percent released
BK	74	182	256	0.43	71
LCT	99	245	344	0.57	71
BN	0	2	2	0.00	100
Total	173	429	602		

In 2014, anglers reported being less satisfied with their overall angling experience than in 2013 but was an increase from both 2011 and 2012 (Tables 5). Anglers have had a positive average angling experience responses all four 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 unsatisfied with the size of the trout, though their average response has increased every year from -0.33 in 2011 to -0.16 in 2013 and 2014 (Table 5). When reporting their satisfaction with the number of fish, anglers had negative experiences in 2011 and 2012 (-0.14 & -0.15), but in 2013 and 2014, anglers were much more satisfied with the number of fish, yielding an average response of 0.44. This is consistent with what the roving creel survey provided (Onanian 2014).

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

## 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 four years. Overall catch and CPUE in 2014 decreased from 2013 but remain high. The decrease in 2014 can be attributed to the reduced LCT stocking in 2013 and 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 number of respondents in the 2014 survey decreased from 2012 and 2013. Ideally the more respondents provide 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. CDFW staff should continue to notify anglers of the ASB at Red Lake, and how helpful angler participation in the survey is.

The greatest percentage of anglers fished from the shore and were successful in catching trout, however float tube anglers have had the greatest catch per angler. Catch rates for anglers using flies were much higher than other forms of tackle. There were only 16 fly fishermen and there were 175 or more anglers using other types of tackle. These few fly fishermen could have been more skilled at fishing this lake, resulting in a much higher average catch rate.

Unlike creel surveys conducted in the past three years, ASB surveys have shown significantly more LCT caught rather than BK by anglers. Historically, Red Lake was a BK fishery but were last stocked into Red Lake in 2010. Red Lake has and continues to receive both LCT sub-catchable 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 greatest number of trout caught in Red Lake are in the 8-9.9 in. size class. This corresponds generally with stocking data, as 29,629 (97%) of the LCT stocked by CDFW were less than 10 inches in length (Appendix 1). Anglers were not satisfied with the size of trout they were catching, and would prefer to be catching larger trout. Although not satisfied with the size of the trout they were catching, the public has been satisfied with the numbers of trout caught the last two 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 19 LCT over 20 inches were caught and reported in the last four 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 discover 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. A potential way to foster growth would be to decrease the number of sub-catchable fish planted, as to reduce competition for resources and provide more resources for the fish to grow.

The overall fishing experience for anglers has been positive at Red Lake the last four years. Averages of responses had increased over the previous three years, averaging 0.74 in 2013, but dropped in 2014 with 0.54. 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. Despite the fact that they were considered small, many anglers are happy to catch fish. To maintain angler satisfaction with Red Lake, fisheries managers should continue stocking strategies and sustain a plentiful fishery.

## **Recommendations**

- CDFW staff should install a species identification board on the ASB 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 attempt to increase the average size of trout in the lake by decreasing the number of trout planted. A decreased volume of planted trout would 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