

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

Red Lake, Alpine County

2011-2017 Angler Survey Box Analysis



Ben Ewing  
Environmental Scientist

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## Introduction

Red Lake is an 85 surface acre reservoir in Alpine County that is situated at approximately 7,800 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 (Figure 1). 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 sportfishing regulation.

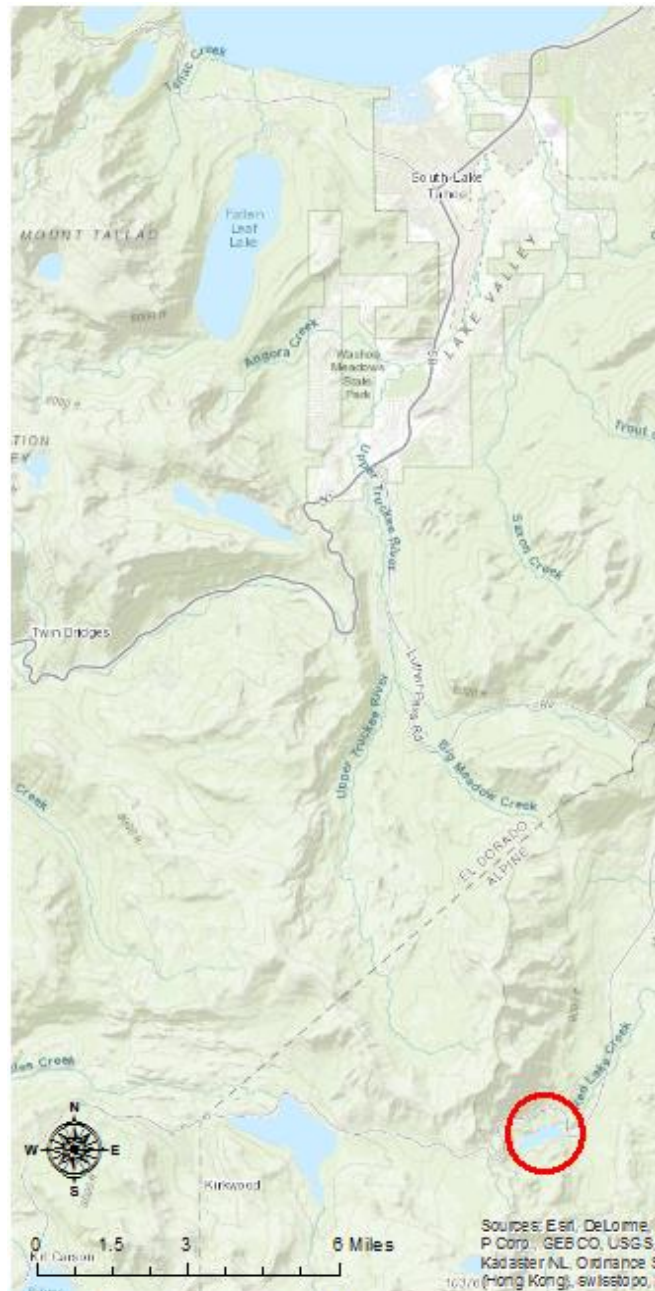


Figure 1. Red Lake, Alpine County.

Red Lake has been 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). CDFW stocks Red Lake with sub-catchable LCT in addition to catchable brood-stock LCT collected 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 Red Lake (Figure 2). Anglers voluntarily complete a survey sheet after they complete their fishing trip, and deposit it in the box. CDFW uses this data to assess angler satisfaction, species composition, and general angler statistics at Red Lake. This report covers the data collected from Red Lake's ASB from 2011 - 2017.

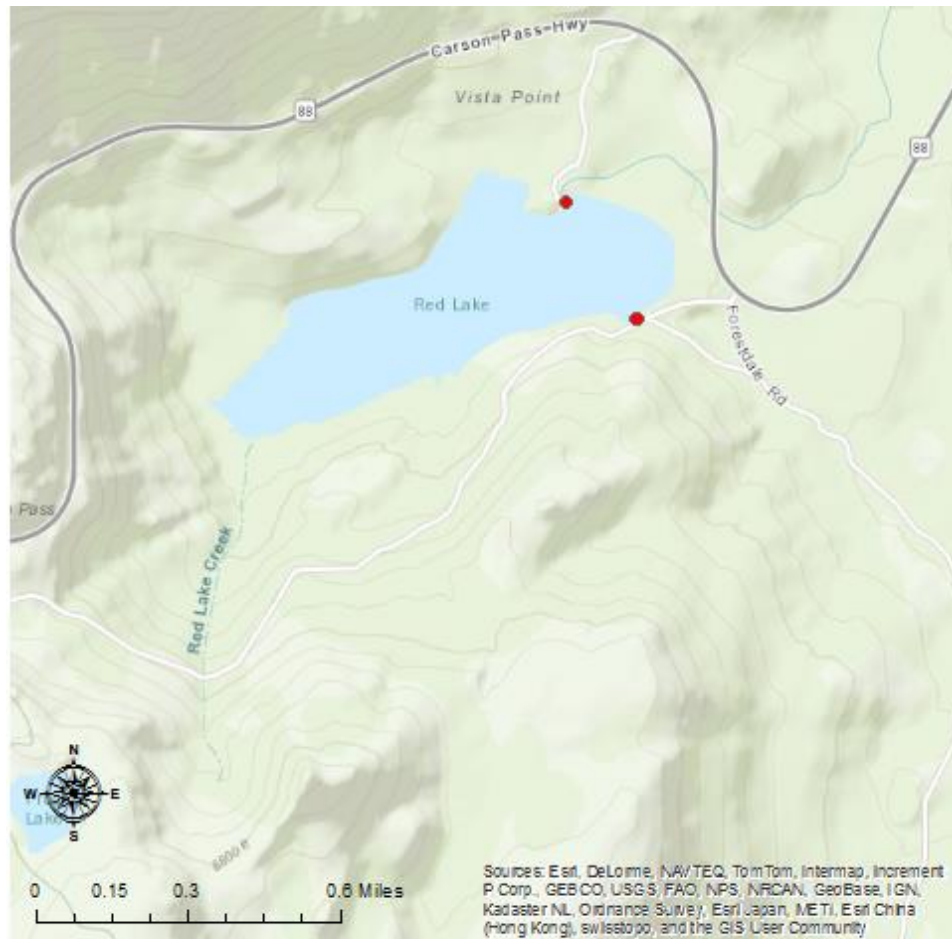


Figure 2. Red Lake ASB Locations, Alpine County.

## Methods

Anglers were asked to complete 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 fish. Anglers 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 was reserved for anglers who had any additional comments (Appendix 2).

## Results

In 2017, Red Lake had 19 respondents, which was well below the 2011 – 2017 average of 56 (range: 19 - 116) anglers who responded to the survey (Table 1) and the lowest in the 2011 - 2017 survey period. Cumulatively, these anglers landed 105 fish and logged 63 fishing hours in 2017, which is also below the seven year average of 188.73 hours and 159 fish landed. The catch per angler and catch per hour in 2017 of 5.53 and 1.67 increased from the average of 3.26 and 0.99, respectively over the seven year period.

Table 1. Collection of average effort and catch statistics recorded from the ASB at Red Lake, 2011 - 2017.

| 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          | 181.50       | 224         | 3.67             | 1.23           | 2.98             |
| 2014    | 41          | 132.00       | 136         | 3.32             | 1.03           | 3.22             |
| 2015    | 66          | 220.25       | 170         | 2.58             | 0.77           | 3.34             |
| 2016    | 116         | 423.50       | 211         | 1.82             | 0.50           | 3.65             |
| 2017    | 19          | 63.00        | 105         | 5.53             | 1.67           | 5.53             |
| Average | 56          | 188.73       | 159         | 3.26             | 0.99           | 3.67             |

Fourteen anglers (73.7%) reported fishing from shore, which resulted in the best success in terms of catch per angler (6.43) in 2017 (Table 2). Shore fishing was also the most popular method of fishing in 2017 (n = 14). One angler (5.3%) reported fishing from boat, which resulted in the second best success in terms of catch per angler (4.00) in 2017. Anglers who did not record their method of fishing had a 3.67 catch per angler. The least used method for a third consecutive year was float tube fishing. This method yielded no fish in 2015 and 2016, and no anglers reported using a float tube for fishing in 2017.

Table 2. Number of anglers and catch per angler based on angling method at Red Lake, 2011 - 2017.

| Method       | 2011 - 2014           |                  | 2015                  |                  | 2016                  |                  | 2017                  |                  |
|--------------|-----------------------|------------------|-----------------------|------------------|-----------------------|------------------|-----------------------|------------------|
|              | Number of Anglers (%) | Catch per Angler | Number of Anglers (%) | Catch per Angler | Number of Anglers (%) | Catch per Angler | Number of Anglers (%) | Catch per Angler |
| Boat         | 16 (8%)               | 2.38             | 2 (3.0%)              | 1.50             | 4 (3.4%)              | 2.50             | 1 (5.3%)              | 4.00             |
| Float tube   | 25 (13%)              | 3.92             | 1 (1.5%)              | 0.00             | 1 (1.0%)              | 0.00             | NA                    | NA               |
| Shore/Wading | 142 (75%)             | 3.04             | 58 (87.9%)            | 2.64             | 102 (87.9%)           | 1.81             | 14 (73.7%)            | 6.43             |
| Multiple     | NA                    | NA               | NA                    | NA               | 2 (1.7%)              | 0.00             | 1 (5.3%)              | 0.00             |
| Not recorded | 7 (4%)                | 4                | 5 (7.6%)              | 2.80             | 7(6.0%)               | 2.29             | 3 (15.8%)             | 3.67             |
|              | 190                   |                  | 66                    |                  | 116                   |                  | 19                    |                  |

Anglers used bait, lures, and flies while fishing at Red Lake (Table 3). In 2017, seven anglers (36.8%) used bait to catch fish, which was a decrease from any previous year. The least frequent identified method in 2017, similar to any previous year, was the fly method, in which no anglers strictly used flies. Bait anglers had the highest catch rate (9.14 catch per angler) in 2017, which was the highest catch per angler value on record for any gear type used at Red Lake. Lure method anglers had the second highest identified catch rate in 2017 (5.00 catch per angler), which is a large increase from any previous year (2.59, 2016; 1.45, 2015; 3.63, 2011 – 2014). In 2017, one angler who did not record the gear type used and caught no fish, which is a decrease from any previous year (2.00, 2016; 2.00, 2015; 1.00, 2011 – 2014).

Table 3. Frequency of anglers that used each angling method and corresponding catch rates from 2011 - 2017.

| Angling method | 2011 - 2014       |                  | 2015              |                  | 2016              |                  | 2017              |                  |
|----------------|-------------------|------------------|-------------------|------------------|-------------------|------------------|-------------------|------------------|
|                | Number of Anglers | Catch per Angler | Number of Anglers | Catch per Angler | Number of Anglers | Catch per Angler | Number of Anglers | Catch per Angler |
| Bait           | 77 (40.3%)        | 2.38             | 48 (72.7%)        | 3.06             | 61 (52.6%)        | 1.79             | 7 (36.8%)         | 9.14             |
| Lure           | 54 (28.3%)        | 3.63             | 11 (16.7%)        | 1.45             | 27 (23.3%)        | 2.59             | 5 (26.3%)         | 5.00             |
| Fly            | 16 (8.4%)         | 6.31             | 1 (1.5%)          | 0.00             | 5 (4.3%)          | 0.80             | NA                | NA               |
| Multiple       | 40 (20.9%)        | 2.78             | 4 (6.1%)          | 0.75             | 22 (19.0%)        | 1.18             | 6 (31.6%)         | 2.67             |
| Not recorded   | 4 (2.1%)          | 1.00             | 2 (3.0%)          | 2.00             | 1 (0.9%)          | 2.00             | 1 (0.05%)         | 0.00             |
|                | 191               |                  | 66                |                  | 116               |                  | 19                |                  |

In 2017, anglers caught fewer fish (n = 105) than any sampling period since 2011 (Figure 3). 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, 65% of the fish landed were LCT and 13 % were BK. In 2015, 64% of identifiable trout landed were LCT, eight percent were BK, 24% percent were unidentifiable trout, and three percent were other species. In 2016, 84%



of identifiable trout landed were LCT, eight percent were BK, and eight percent were a combination of unknown species/trout. In 2017, 68% of identifiable trout landed were LCT, 18% were unknown species, 10% were tui chubs, three percent were suckers, and one percent were brook trout. Brown trout only appeared 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 stocked in Red Lake since 2011 by CDFW.

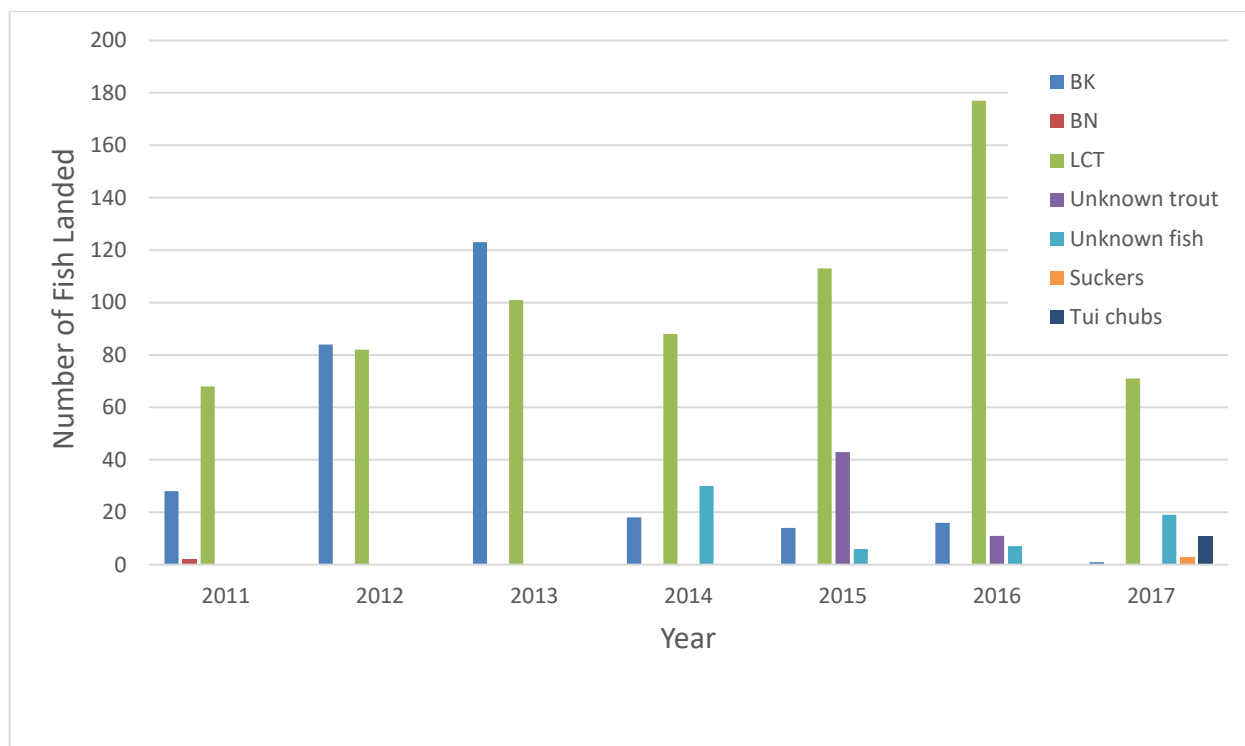


Figure 3. Number of each species of fish caught annually from at Red Lake, 2011 - 2017.

The 2011 – 2014 ASB data showed that 72% (428 fish) of the landed trout measured less than 10 inches in total length (Figure 4) which decreased to 24% in 2015, 22% in 2016, and increased to 43% in 2017. Only eight percent of landed trout measured between 12 and 20 inches from 2011 - 2014, but increased to 54% in 2015 and 58% in 2016, then decreased to 21% in 2017. Only three, two, and four percent of fish caught were greater than 20 inches in 2011 – 2014, 2015, and 2016 respectively, but increased almost seven fold in 2017 to 26%.

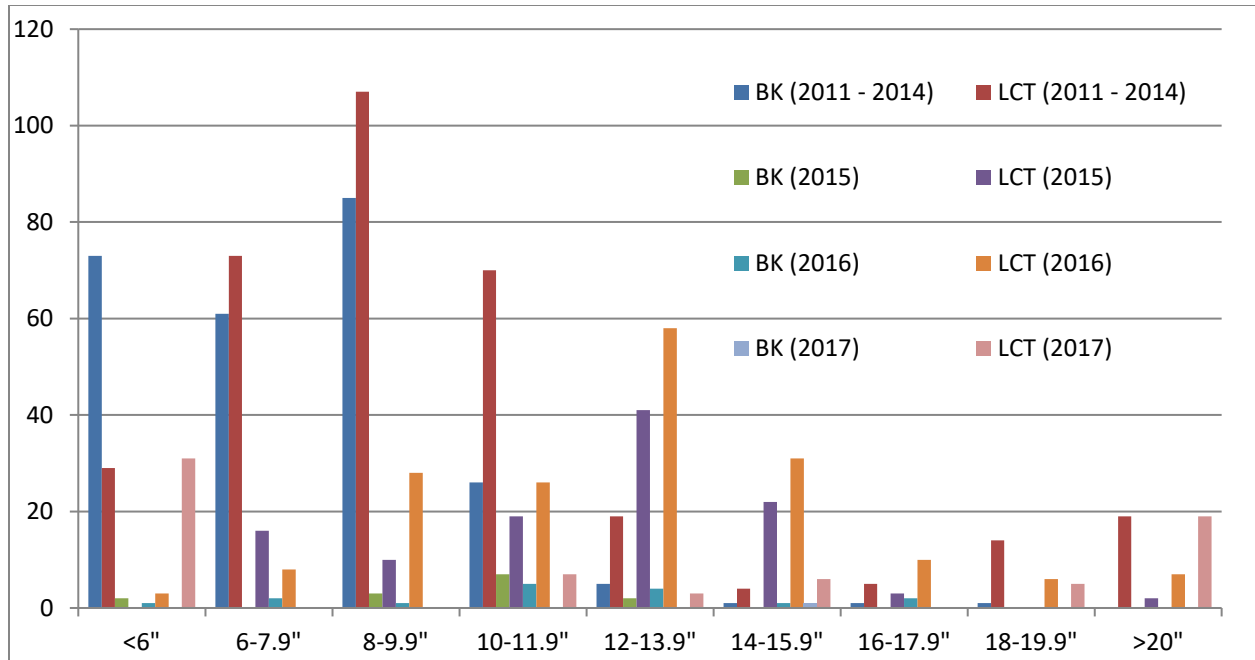


Figure 4. Frequency of identified trout in each size class that anglers reported landing on Red Lake, 2011-2017.

The 2011 – 2014 ASB data showed that although more LCT were caught than BK, the percentage released of each species was the same (71%) (Table 4). In 2015, 50% of BK were released compared to only 12% of LCT released. In 2016, 50% of BK were released while 38% of LCT were released. In 2017, no BK were released while 37% of LCT were released. Eleven percent of unknown fish, 100% of suckers, and no tui chubs were released in 2017.

Table 4. Data on kept and released trout at Red Lake from 2011 - 2017.

| 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           | 8.0                    | 50.0             |
|             | LCT           | 99   | 14       | 113          | 64.2                   | 12.4             |
|             | Unknown trout | 43   | 0        | 43           | 24.4                   | 0.0              |
|             | Other         | NA   | NA       | 6            | 3.4                    | NA               |
|             |               | 149  | 21       | 176          |                        |                  |
| 2016        | BK            | 8    | 8        | 16           | 7.8                    | 50.0             |
|             | LCT           | 109  | 68       | 177          | 85.9                   | 38.4             |
|             | Unknown fish  | 11   | 2        | 13           | 6.3                    | 15.4             |
|             |               | 128  | 78       | 206          |                        |                  |
| 2017        | BK            | 1    | 0        | 1            | 1.0                    | 0.0              |
|             | LCT           | 45   | 26       | 71           | 67.6                   | 36.6             |
|             | Unknown fish  | 17   | 2        | 19           | 18.1                   | 10.5             |
|             | Suckers       | 0    | 3        | 3            | 2.9                    | 100.0            |
|             | Tui chub      | 11   | 0        | 11           | 10.5                   | 0.0              |
|             |               | 74   | 31       | 105          |                        |                  |

\*In 2016, the disposition of 5 fish caught was not recorded.

In 2017, anglers reported being more satisfied with their overall angling experience than any previous year (Tables 5). Anglers had a positive average angling experience response all seven years, which is an indication that the fishery provides a 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 third consecutive year in seven years. The 0.87 “size” value is the highest of any previous year. Anglers were satisfied with the number of fish caught for a fifth consecutive year. The 0.93 “number” value was also the highest recorded value for any year surveyed.

Table 5. Angler satisfaction response averages for the Red Lake fishery from 2011 through 2017.

| 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           |
| 2016 | 0.08                       | 0.43             | 0.10           |
| 2017 | 1.06                       | 0.87             | 0.93           |



## Discussion

Data gathered from the Red Lake ASBs have shown anglers have caught over three fish a day on average the last seven years. Overall catch in 2017 was the second lowest in seven years, but catch per hour and catch per angler were at historic highs. In 2017, the majority of anglers fished from shore, and those fishing from shore also had the greatest catch per angler. It is possible the higher overall catch per angler and catch per hour were a function of less angling pressure on the lake compared to previous years, causing the fish to be less spooky. The 2017 season had the greatest catch rates and satisfaction values, which may have resulted from CDFW stocking more brood stock LCT since 2013.

The greatest number of fish caught in 2017 were in the < 6 in. size class for the first time. Twenty-eight of the LCT that were < 6 in. were caught on June 1, 2017, which is prior to the 2017 LCT subcatchable stocking. It may be possible that anglers are catching wild LCT that are naturally spawning at Red Lake. Before 2013, anglers were unsatisfied with the number of trout they were catching. It is possible that the decrease in fish plants over the years has decreased competition for food, increased LCT survivability in Red Lake, and allowed LCT in Red Lake to grow to larger, catchable sizes. Anglers have been satisfied with the size of trout caught the last three years. It is often difficult to manage a fishery to satisfy both high catch rates and large size of fish caught, but from 2015 - 2017 it was accomplished. CDFW has stocked brood-stock (2 lb) LCT from Heenan Lake into Red Lake for over 20 years, but anglers were not reporting catching many of these larger fish (i.e., only 28 LCT over 20 inches were caught and reported before 2017). However, 19 of the 71 LCT caught in 2017 were over 20 inches, which is a large improvement. This large increase may be because 370 brood-stock were stocked into Red Lake in 2017 while only 300 total brood-stock were stocked in 2015 and 2016. CDFW creel clerks have reported seeing numerous trout in the one to five pound range swimming downstream of Red Lake in Red Lake Creek when the water levels are high. The brood-stock LCT could potentially be swimming downstream because they are stocked during their spawning season. Prior to 2017, CDFW was looking into transferring the entire brood-stock allotment into other nearby waters such as Burnside Lake, because private property limits angler access to Red Lake Creek. However, based on the 2017 results, CDFW may continue stocking a portion of the brood-stock into Red Lake.

The 2011 – 2014 ASB data showed that although more LCT were caught than BK, the percentage released of each species was the same. In 2015, more BK were released than LCT. This is likely because of the relatively small sizes of BK caught at Red Lake compared to LCT. Again in 2016, more BK were released than LCT. Only one BK was caught in 2017 and was kept by the reporting angler. Unlike creel surveys conducted in the past three years, ASB surveys have shown significantly more LCT caught than BK. Historically, Red Lake was a BK fishery, but

CDFW has not stocked BK into Red Lake since 2010. Red Lake has, and continues to receive both sub-catchable LCT (when available) and Heenan Lake LCT brood-stock. The continued stockings of LCT and discontinuation of BK stocking may explain the increase of LCT caught when compared to BK.

The overall fishing experience for anglers has been positive at Red Lake every year surveyed with the highest value of satisfaction reported in 2017. One reason anglers are generally satisfied is because most anglers are catching fish. After a complete trip, anglers caught an average of over three fish per person over the seven year average.

The number of respondents in the 2017 survey was the lowest in seven years, which appears to be consistent with other ASBs in the near vicinity in 2017. Ideally, the more respondents, the more feedback it provides CDFW of angler success at the fishery. Regardless, it appears the few anglers who did respond to the ASB in 2017 had a phenomenal season.

### 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 |
| 5/20/2016 | LCT     | 375           | 150    | Super-catchable |
| 5/31/2016 | LCT     | 150           | 1005   | Sub-catchable   |
| 6/4/2017  | LCT     | 290           | 145    | Super-catchable |
| 6/6/2017  | LCT     | 430           | 215    | Super-catchable |
| 6/13/2017 | LCT     | 125           | 1000   | Sub-catchable   |

# Red Lake

The California Department of Fish and Wildlife is conducting an evaluation of the trout fishery on Red Lake. We request your help in this evaluation by providing the following information in this survey. Please use this form for **one** day's fishing on Red Lake by **one** angler only.

Date Fished:

# Hours Fished:

mm/dd/yyyy

Primary gear type used (check one):

9

Primary method or location fished (check one):

☐

Enter the total number of fish caught by species and size class:

| Size            | brook trout |          | Lahontan cutthroat trout |          | Other: |          |
|-----------------|-------------|----------|--------------------------|----------|--------|----------|
|                 | Kept        | Released | Kept                     | Released | Kept   | Released |
| Less than 6"    |             |          |                          |          |        |          |
| 6"-7.9"         |             |          |                          |          |        |          |
| 8"-9.9"         |             |          |                          |          |        |          |
| 10"-11.9"       |             |          |                          |          |        |          |
| 12"-13.9"       |             |          |                          |          |        |          |
| 14"-15.9"       |             |          |                          |          |        |          |
| 16"-17.9"       |             |          |                          |          |        |          |
| 18"-19.9"       |             |          |                          |          |        |          |
| 20" and greater |             |          |                          |          |        |          |

Please indicate your level of satisfaction with the following statements regarding your fishing experience today:

Least satisfied

Overall angling experience today:

-2

Size of fish:

-2

Number of fish:

-2

Please use the back of this form for any additional comments. Thank you for taking the time to fill out this form.

