

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

**Donner Lake, Nevada County  
Angler Survey Box Analysis 2016 - 2019**



**Donner Lake** (© Justin Smith / Wikimedia Commons, CC-BY-SA-3.0)

**Mitch Lockhart  
February 2020**

## Introduction

Donner Lake is a natural alpine lake located in Nevada County, California, near the city of Truckee and Interstate 80 at an elevation of 5,936 feet above mean sea level. It is three miles long and about  $\frac{3}{4}$  miles wide with a surface area of approximately 1.5 square miles. The maximum water depth of Donner Lake is 328 feet with an average depth of 108 feet. The main tributaries are Summit Creek, Gregory Creek, Billy Mack Creek, and numerous springs. Outflow is regulated by a small dam on Donner Creek, the lake's only outlet, which flows for approximately 2.5 miles until its confluence with the Truckee River. Sierra Pacific Power Company and the Truckee Carson Irrigation District manage the dam and stored water at Donner Lake.

Donner Lake supports a coldwater fishery of Brown Trout (*Salmo trutta*; BN), Rainbow Trout (*Oncorhynchus mykiss*; RT), Lake Trout (*Salvelinus namaycush*; LT), and Kokanee Salmon (*Oncorhynchus nerka*; KOK). Currently, the California Department of Fish and Wildlife (CDFW) actively stocks Donner Lake several times a year with Lahontan Cutthroat Trout (*Oncorhynchus clarkii henshawi*; LCT) and RT, and once a year with KOK (**Table 1**). CDFW manages the fishery partly as a RT "put and take" fishery and partly as a KOK and LCT "put and grow" fishery. The BN and LT populations are self-sustaining, wild fisheries established by historical plants.

## Methods

In order to assess the fishery at Donner Lake, and its associated angler satisfaction, CDFW installed an angler survey box (ASB) at the Donner Lake Boat Ramp, a public boat launch on the northwestern side of the lake (**Figure 1**), in September 2014. The Donner Lake Boat Ramp, which is owned and operated by Nevada County's Truckee Donner Recreation and Park District, is the primary public access point to launch a boat onto the lake.

At the ASB location is a sign requesting anglers fill out a volunteer survey form describing their catch, effort, and satisfaction. The angler survey form includes questions about hours fished, type of gear, and methods used, and the number of fish

landed. In addition, successful anglers can report the size and species of fish landed and whether they kept or released their catch. Lastly, the survey includes three questions about the angler’s satisfaction with: 1) overall angling experience; 2) size of fish; and 3) number of fish. Anglers record answers on a scale of +2 to -2, with “+2” representing most satisfied and “-2” representing least satisfied. Anglers can use the back of the survey form for any additional comments. See **Appendix II** for a copy of the survey form.

**Table 1.** CDFW Donner Lake Fish Stocking History, 2010 to 2019.

Year	Species	Number (no.) or Pounds (lbs) of Fish Planted		Size
2019	RT	9,020	Lbs.	Catchable
2019	LCT	50,000	no.	Fingerling
2019	LCT	2,050	no.	Sub-Catchable
2019	KOK	24,998	no.	Fingerling
2018	RT	6,800	Lbs.	Catchable
2018	LCT	7,200	no.	Sub-Catchable
2017	RT	7,800	Lbs.	Catchable
2017	LCT	8,640	no.	Sub-Catchable
2017	KOK	25,000	no.	Fingerling
2016	LCT	15,092	no.	Sub-Catchable
2016	KOK	25,042	no.	Fingerling
2016	RT	3,038	Lbs.	Catchable
2016	LCT	29,410	no.	Fingerling
2015	KOK	25,000	no.	Fingerling
2015	RT	9,011	Lbs.	Catchable
2015	RT	96,648	no.	Fingerling
2015	RT	890	no.	Sub-Catchable
2014	KOK	49,994	no.	Fingerling
2014	RT	15,300	Lbs.	Catchable
2014	RT	100,000	no.	Fingerling
2013	KOK	49,997	no.	Fingerling
2013	RT	13,200	Lbs.	Catchable
2012	KOK	49,994	no.	Fingerling
2012	RT	13,818	Lbs.	Catchable
2011	KOK	50,048	no.	Fingerling
2011	RT	16,000	Lbs.	Catchable
2010	KOK	50,050	no.	Fingerling
2010	RT	16,000	Lbs.	Catchable



**Figure 1.** Map of Donner Lake with the locations of Donner Lake Boat Ramp, Shoreline Park and China Cove marked for reference. CDFW installed the angler survey box (ASB) at Donner Lake Boat Ramp.

## Results

The ASB at Donner Lake contained 46 answered forms from April 2016 to September 2019. Participation is exceptionally low at the Donner ASB. Anglers submitted nine forms during the 2019 calendar year; 13 forms during the 2018 calendar year; 12 forms during the 2017 calendar year; and 12 forms during the 2016 calendar year. This contrasts with the 35 forms submitted during the 2015 calendar year (Serup and Lockhart 2015).

In total, the 46 participating anglers fished for 200.75 hours. Thirty-eight anglers (83%) were successful and landed 156 fish. These results average to an individual angler landing 3.4 fish with a catch rate of 0.78 fish per hour (**Table 2**).

**Table 2.** Catch Statistics and Angler Effort for Donner Lake 2016 to 2019.

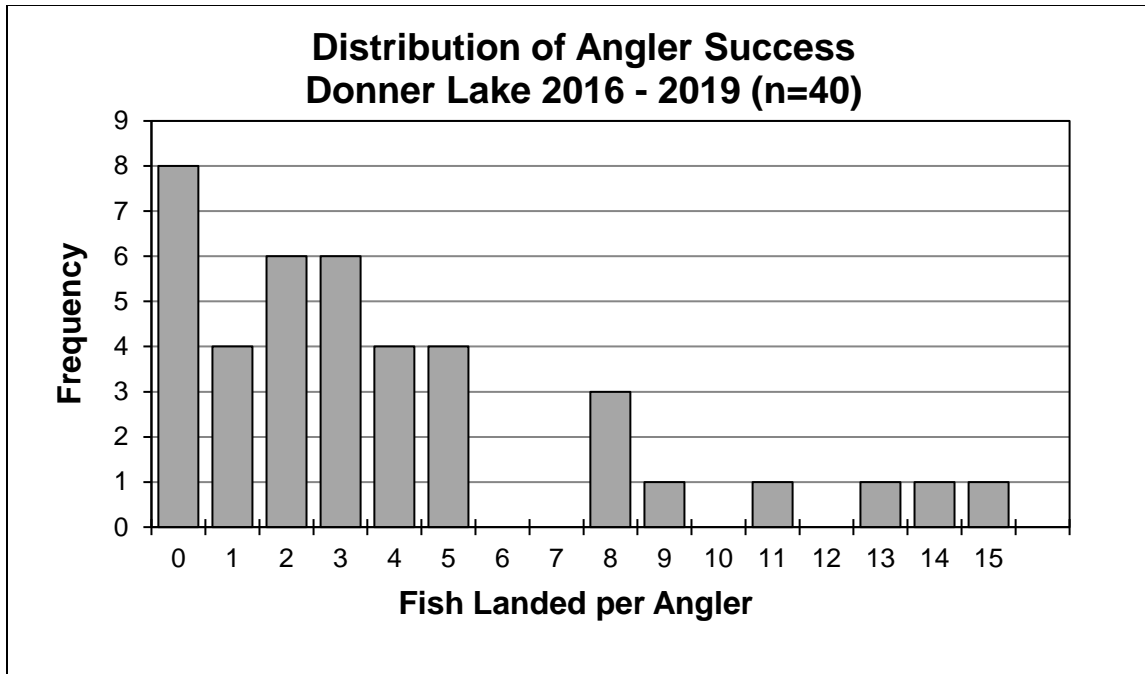
Year	2016	2017	2018	2019	Total
Number of Anglers	12	12	13	9	<b>46</b>
Total Hours Fished	54	57.25	57	32.5	<b>200.75</b>
Total Number of Fish Landed	29	56	37	34	<b>156</b>
<b>Fish/Hour</b>	<b>0.5</b>	<b>1.0</b>	<b>0.6</b>	<b>1.0</b>	<b>0.8</b>
<b>Number of Fish per Angler</b>	<b>2.4</b>	<b>4.7</b>	<b>2.8</b>	<b>3.8</b>	<b>3.4</b>

**Table 3** summarizes the species composition of fish landed and released by year. RT comprised 60% (n=94) of the total catch at Donner Lake from 2016 to 2019. Twenty-one percent (n=32) of the catch was KOK followed by LT at 16% (n=25). BN, LCT, and Catfish were all near one percent of the total catch. Anglers harvested 76% (n=119) of fish landed with RT accounting for the largest portion of the harvest (n=72). KOK had the highest harvest rate of any species with 30 KOK harvested of the 32 landed (94%).

**Table 3.** Catch and Harvest by Species for Donner Lake 2016 to 2019.

Species	2016	2017	2018	2019	Percent Catch	Total Catch	Total Harvest	Percent Harvest
Rainbow Trout	0	49	27	18	60%	94	72	77%
Lake Trout	14	6	5	0	16%	25	16	64%
Kokanee Salmon	13	0	3	16	21%	32	30	94%
Brown Trout	0	0	2	0	1.3%	2	1	-
Lahontan Cutthroat Trout	0	1	0	0	0.6%	1	0	-
Catfish	2	0	0	0	1.3%	2	0	-
<b>Totals</b>	<b>29</b>	<b>56</b>	<b>37</b>	<b>34</b>		<b>156</b>	<b>119</b>	<b>76%</b>

Most (83%; n=36) of the reporting anglers were successful and landed at least one fish during their trip (**Figure 2**). Six anglers reported catching fish but did not report how many fish they caught and are not included from the summary in **Figure 2**. Of the 40 anglers included in the summary over half (n=22; 55%) caught at least three fish. Four anglers (10%) were highly successful and landed over 10 fish each.

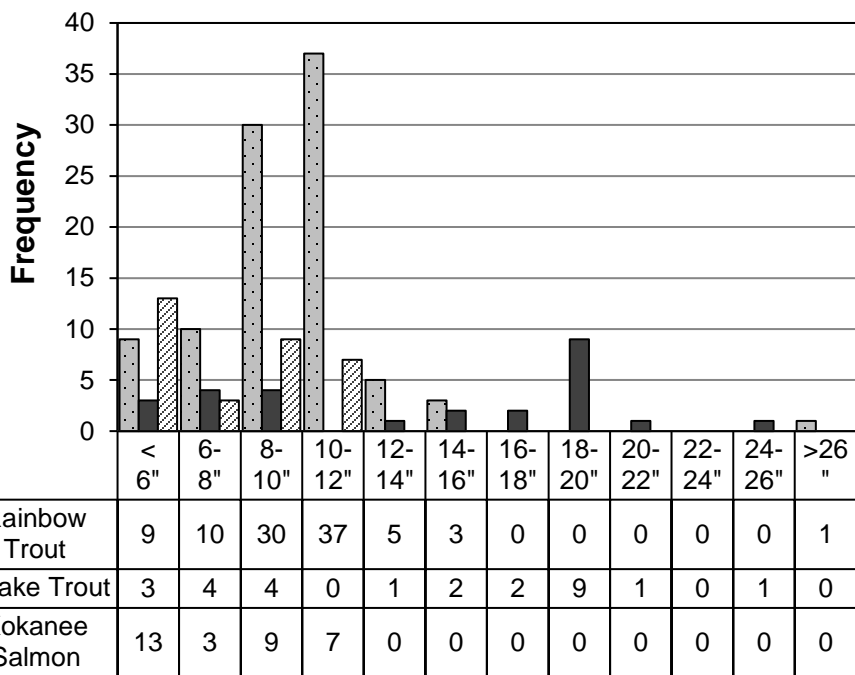


**Figure 2.** Distribution of angler success for Donner Lake as reported by voluntary Angler Survey Box forms from 2016 to 2019. The x-axis represents the number of fish landed per angler, ranging from zero fish landed upwards to 15 fish landed. The y-axis displays the frequency of anglers who reported landing a given number of fish.

**Figure 3** displays the length distribution of fish landed at Donner Lake from 2016 through 2019. The modal size class for RT was 10-12” accounting for 39% (n=37) of the RT landed. The modal size class for KOK was < 6”. Thirteen of the 32 KOK landed (41%) were in this size class. The modal size class of LT was 18-20” accounting for 36% (n=9) of the LT landed.

From 2016 to 2019, anglers were most successful during June (**Figure 4**). Nine anglers fished for 41 hours and caught 39 fish for a catch rate of 0.95 fish per hour. Most anglers (n=11) reported fishing during August. Lures were the most frequent type of gear used (**Table 4**). Twenty-one anglers reported fishing with lures, 20 of whom were successful (95%), landing 82 fish for a catch rate of 1.0 fish per

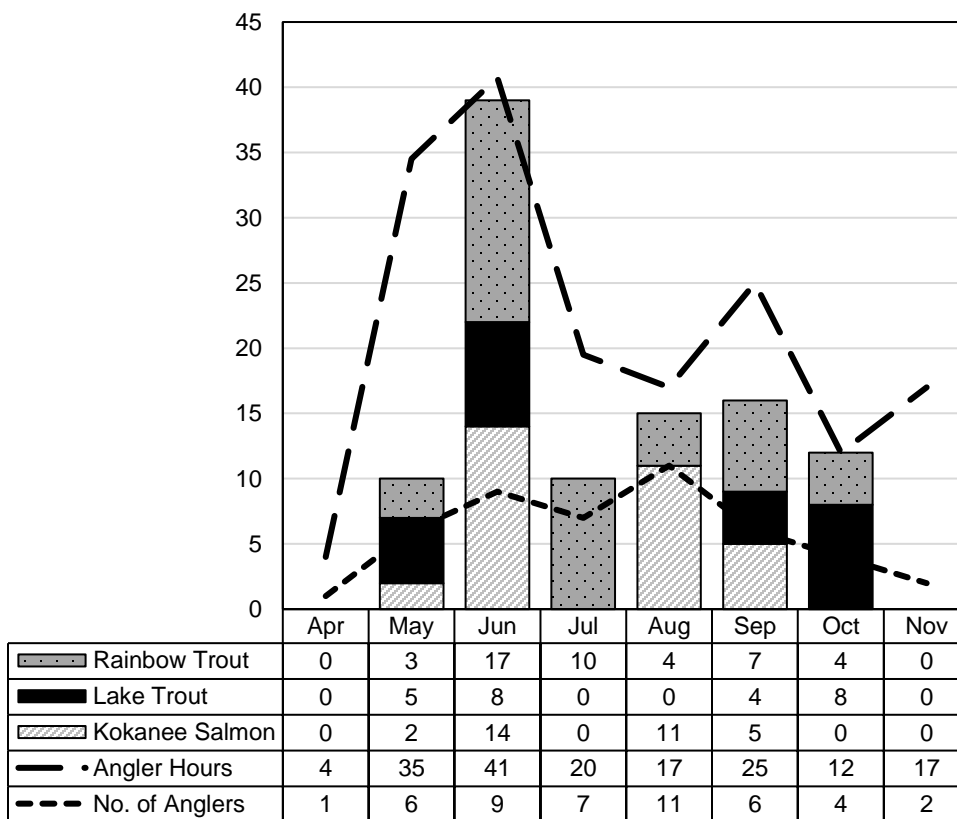
**Length Frequency of Fish Landed at Donner Lake 2016-2019**



**Length Classes**

**Figure 3.** Length frequency distribution of Rainbow Trout, Lake Trout, and Kokanee Salmon landed at Donner Lake between 2016 and 2019 as reported by voluntary Angler Survey Box forms. The x-axis represents 2-inch size classes ranging from “less than 6 inches” to “greater than 26 inches”. The y-axis displays the frequency of fish landed within a given size class. The summary table below the graph summarizes the results.

**Catch and Angling Effort by Month Donner Lake 2016-2019**



**Figure 4.** The stacked columns display the monthly catch of Rainbow Trout, Lake Trout, and Kokanee Salmon. The two lines display monthly angling effort. The heavy dashed line is total fishing effort in angler hours. The dotted line is total number of anglers. The x-axis displays the 8 calendar months that anglers reported fishing. The y-axis represents the number of fish caught, angling hours, or number of anglers. The summary table below the graph summarizes the results.

**Table 4.** Angler Success and Catch Rate by Gear Type and Angling Methods used at Donner Lake, 2016 to 2019.

	No. of Anglers	Percent Angler Success	Fish Landed	Catch per Hour
Bait	15	93%	55	1.2
Lure	21	95%	82	1.0
Bait / Lure	7	43%	9	0.3
Boat	18	89%	55	0.7
Shore	15	93%	51	1.2

hour. Bait anglers reported similar success (93%), landing 55 fish for a catch rate of 1.2 fish per hour. Of the 33 anglers who reported fishing from either boat or shore, the success rate was similar, 89% and 93% respectively. Shore anglers reported a higher catch rate of 1.2 fish per hour, compared to 0.7 fish per hour for boat anglers.

Of the 46 anglers who completed angler survey forms from 2016 to 2019, a total of 45 answered the survey questions related to satisfaction with their fishing experience at Donner Lake (**Table 5**). In general, anglers were mildly satisfied with their overall fishing experience at Donner Lake and ‘very satisfied’ (5) was the most common response (n=19). Unsuccessful anglers tended to rate their overall satisfaction lowest, however, number of fish caught was not a good predictor of overall satisfaction ( $R^2 = 0.11$ ). Similarly, anglers were generally ‘mildly satisfied’ with the size and number of fish landed while fishing at Donner Lake and ‘satisfied’ (4) was the modal response for both categories. Interestingly, the number of fish caught reported by an angler was a poor predictor of the angler’s satisfaction with number of fish caught ( $R^2 = 0.12$ ). Some anglers reported being ‘satisfied’ with catching two fish while another reported being ‘unsatisfied’ with an eleven fish catch.

**Table 5.** Angler Satisfaction Results, Donner Lake 2016 – 2019.

Year	2016	2017	2018	2019	4-year Average	4-year Mode
Overall Angler Satisfaction	0.0	1.2	1.4	1.1	0.9	2
Size of Fish	0.2	0.2	0.9	0.9	0.6	1
Number of Fish	-0.3	0.8	0.5	0.9	0.4	1

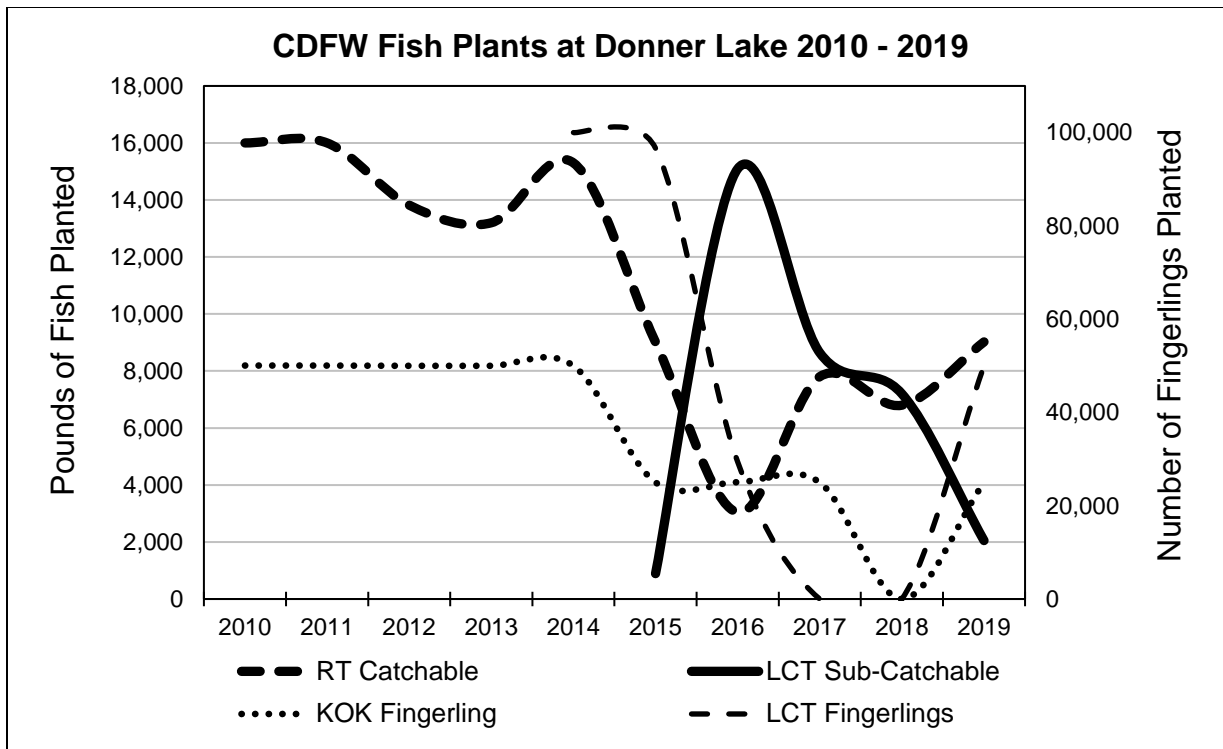


## Discussion

Anglers at Donner Lake landed RT from May through October during the reporting period of 2016 to 2019. Four of the five most successful RT anglers fished within 10 days of a CDFW catchable-sized RT plant. The most successful RT angler landed 15 fish from a boat on July 12, 2017, the same day of a planting event. While the second most successful angler landed 14 RT from shore three days later. Of the 98 RT landed during the reporting period, 37 were 10-12 inches in length (38%) and 76 (78%) fish landed were greater than 8 inches in length. This is a significant increase in modal size since 2015 when 62% of RT caught were 8 inches or smaller (Serup and Lockhart 2015). This observed shift may be due in part to improved water quality at American River Hatchery since the end of the 2011 to 2015 drought. As a result, trout production and health at American River Hatchery has increased, in recent years, compared to 2015 and 2016. To continue this trend into the future, catchable RT plants should continue to increase in number and frequency to pre-drought levels.

Donner Lake anglers landed KOK May through September, with June being the most productive month. Most of the KOK landed (n=16; 50%) were 8-12 inches in length. Kokanee anglers reported being 'very satisfied' with their overall angling experience, and 'satisfied' with the size and number of fish. This is consistent with anecdotal reports about the Kokanee fishery at Donner Lake (Murphy, pers. comm.). Donner Lake will continue to be managed as a 'fast-action' Kokanee fishery and stocking allotments will be maintained at approximately 25,000 fingerlings annually (**Figure 5**).

CDFW planted LCT at Donner Lake since 2014. To date, one angler reported landing one LCT. Currently, there is no evidence that a LCT recreational fishery was established by CDFW plants. This is due to several overlapping factors. Due to facility limitations at American River Hatchery, CDFW was not able to hold and grow LCT over summer. As a result, fingerling and sub-catchable-sized fish were the only sizes available for fish plants. Hatchery fish of this size have much lower survivorship than catchable-sized



**Figure 5.** CDFW plants of Rainbow Trout, Kokanee Salmon, and Lahontan Cutthroat Trout at Donner Lake by year (*x-axis*) from 2010 to 2019. Thick lines display the pounds of catchable and sub-catchable fish planted (*left y-axis*). Narrow lines display the number of fingerlings planted (*right y-axis*).

fish. In addition, the sub-catchable fish must be planted by May or June, at the latest, before water temperatures at American River Hatchery begin increasing beyond what LCT can sustain in a hatchery setting. The timing coincides with spawning season for LCT, and high flow and peak run-off in the Donner Lake area. It is likely that many fish planted immediately move into tributaries, such as Donner Creek, either due to high flow or spawning behaviors. CDFW staff witness this behavior at other waters that receive LCT plants, including Echo Lake, El Dorado County (Mamola, pers. comm.), and Red Lake, Alpine County (Hanson, pers. comm.). Additional evidence of this behavior at Donner Lake has been provided by anglers who reported catching LCT in the Truckee River downstream of Donner Creek, in early- to mid- June 2016 and 2018, for approximately two weeks following the CDFW plant at Donner Lake (Sedillo, pers. comm.). Self-sustaining LT and BN populations exist at Donner Lake, and both species

are known to prey on LCT fingerling and sub-catchable-sized fish. These factors are unlikely to improve until American River Hatchery can grow LCT to catchable size.

As a result, CDFW recommends diverting sub-catchable allotments of LCT to other waters. Suitable waters are: 1) east-slope Sierra Nevada waters; 2) accessible by hatchery truck in May; and 3) without LT. In addition, the presence of minnow populations, such as Lahontan Redside (*Richardsonius egregius*) or Golden Shiner (*Notemigonus crysoleucas*), may help establish a robust adult population of LCT to support a recreational fishery.

The Donner Lake boat ramp is often accessible in winter. The lake can continue to serve as a stocking location for surplus LCT that CDFW may need to plant in winter or early spring, to meet hatchery management goals.

## Recommendations

- Survey Donner Creek and inlet creeks after a planting event to assess LCT displacement.
- Modify the ASB form to include LCT in the catch data section.
- Compare ASB results to CDFW Fisheries Branch guide catch log data to confirm management conclusions with alternate data set.
- Anglers did not fill out many survey forms during the reporting period of 2016 to 2019.
  - Install ASB at Shoreline Park, in front of the public piers near Donner Lake Boat Ramp, and at the Donner Lake Memorial State Park near China Cove access points.
  - Increase the visibility of the ASBs with an information board that includes species identification and summaries of ASB and creel data.

## Literature Cited

Serup, B. and M. Lockhart. 2015 ASB Analysis, Donner Lake, Nevada County. CDFW; 3/2015. [Cited 2020 February 14]. Available from:  
<http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=151669>

### Donner Lake

Please use this form for one day's fishing by one angler.

Date Fished: \_\_\_\_\_ Hours Fished: \_\_\_\_\_  
mm/dd/yyyy

Targeted fish species: \_\_\_\_\_

Primary gear type used (check one): \_\_\_\_\_ Type of fishing (check one): \_\_\_\_\_  
 Bait    Lure    Fly                       Boat    Shore

Length in Inches	Rainbow trout		Brown trout		Lake trout		Kokanee		Other:	
	Kept	Release	Kept	Release	Kept	Release	Kept	Release	Kept	Release
< 6										
6 to <8										
8 to <10										
10 to <12										
12 to <14										
14 to <16										
16 to <18										
18 to <20										
20 to <22										
22 to <24										
24 to <26										
>26										

Please indicate your level of satisfaction regarding your fishing experience today:

	Least satisfied		Neutral	Most satisfied	
Overall experience <small>(circle one)</small> :	-2	-1	0	+1	+2
Size of fish <small>(circle one)</small> :	-2	-1	0	+1	+2
Number of fish <small>(circle one)</small> :	-2	-1	0	+1	+2

The California Department of Fish and Wildlife is conducting an evaluation of the fishery at Donner Lake. Thank you for helping us manage and protect California's resources. Please use the back of this form for any additional comments.

### Donner Lake

Please use this form for one day's fishing by one angler.

Date Fished: \_\_\_\_\_ Hours Fished: \_\_\_\_\_  
mm/dd/yyyy

Targeted fish species: \_\_\_\_\_

Primary gear type used (check one): \_\_\_\_\_ Type of fishing (check one): \_\_\_\_\_  
 Bait    Lure    Fly                       Boat    Shore

Length in Inches	Rainbow trout		Brown trout		Lake trout		Kokanee		Other:	
	Kept	Release	Kept	Release	Kept	Release	Kept	Release	Kept	Release
< 6										
6 to <8										
8 to <10										
10 to <12										
12 to <14										
14 to <16										
16 to <18										
18 to <20										
20 to <22										
22 to <24										
24 to <26										
>26										

Please indicate your level of satisfaction regarding your fishing experience today:

	Least satisfied		Neutral	Most satisfied	
Overall experience <small>(circle one)</small> :	-2	-1	0	+1	+2
Size of fish <small>(circle one)</small> :	-2	-1	0	+1	+2
Number of fish <small>(circle one)</small> :	-2	-1	0	+1	+2

The California Department of Fish and Wildlife is conducting an evaluation of the fishery at Donner Lake. Thank you for helping us manage and protect California's resources. Please use the back of this form for any additional comments.

**Figure 6.** ASB form used at Donner Lake for the reporting period, 2016 to 2019.