

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

Frog Lake, Winnemucca Lake, Round Top Lake, and Fourth of July Lake, Alpine County

2018–2021 Angler Survey Box Analysis



Frog Lake



Round Top Lake



Winnemucca Lake



Fourth of July Lake

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July 2025

Introduction

In 2018, the California Department of Fish and Wildlife (CDFW) installed an angler survey box (ASB) at the Carson Pass trailhead, located along the Pacific Crest Trail, to evaluate the fisheries in Frog, Winnemucca, Round Top, and Fourth of July Lakes (**Figure 1**). The trailhead is accessed off Highway 88 at the top of Carson Pass. Anglers voluntarily complete a survey form after their fishing trip, and deposit it in the ASB. CDFW uses these data to assess angler satisfaction, species composition/sizes, and general angler statistics at the identified lakes. This report covers data collected from Frog, Winnemucca, Round Top, and Fourth of July's ASB from 2018–2021.

Environmental Setting

All four lakes are in the Mokelumne Wilderness of the Sierra Nevada mountain range in Alpine County (Mussulman and Lockhart 2016). Three different watersheds are represented between the four lakes. Frog Lake is within the Carson River watershed. Winnemucca and Round Top Lakes are within the South Fork American River watershed, while Fourth of July Lake is within the Mokelumne River watershed. Much of the surrounding habitat consists of open bedrock, montane chaparral, montane riparian, and coniferous forest (CalFire). Eldorado National Forest (ENF) manages the land in the Carson Pass trail area (Lockhart and Mussulman 2016; Chellman 2018). Due to the popularity of the Carson Pass Trail, ENF has placed restrictions on the Carson Pass Management Area to ensure opportunities for solitude, a primitive recreational experience, and to protect popular camping destinations from overcrowding and heavy impacts (ENF Website).

Frog Lake

Frog Lake is a six-acre lake in Alpine County (38° 41' 16.06 N, 119° 59' 10.03 W), situated at 8,865 feet above mean sea level (**Figure 1**). The shoreline is a mix of rocks, sand, and conifer forest. The lake bottom appears to be primarily composed of mud and various-sized rock substrate. When Frog Lake spills, water flows into nearby Red Lake and the West Carson River. The lake receives water from rain and snowmelt runoff from the immediate area. CDFW historically stocked Frog Lake with fingerling-sized Brook Trout (*Salvelinus fontinalis*; BK), Rainbow Trout (*Oncorhynchus mykiss*; RT), and Lahontan Cutthroat Trout (*Oncorhynchus clarkii henshawi*; LCT) with the last recorded stocking of RT in June 2021. Prior to stocking in 2021, the most recent stocking at Frog Lake was an allotment of LCT in 2020. CDFW currently manages Frog Lake as a “put and grow” fishery. Frog Lake is open all year for fishing and other recreational opportunities, but has limited access during the winter season when there is snow.

Winnemucca Lake

Winnemucca Lake is a 54-acre lake in Alpine County (38° 40' 11.56 N, 119° 59' 36.46 W), situated at 8,995 feet above mean sea level (**Figure 1**). The shoreline is a mix of rocks and conifer forest. The lake bottom appears to be primarily composed of mud and various-sized rock substrate. When Winnemucca Lake spills, water drains into nearby Woods Lake and the South Fork American River watershed. The lake receives water from rain and snowmelt runoff from the immediate area. CDFW historically stocked Winnemucca Lake with fingerling-sized BK and RT, with the last recorded stocking of RT in 2000. CDFW currently manages Winnemucca Lake as a self-sustaining BK and RT fishery. Winnemucca Lake is open all year for fishing and other recreational opportunities, but has limited access during the winter season when there is snow.

Round Top Lake

Round Top Lake is a six-acre lake in Alpine County (38° 40' 01.84 N, 120° 00' 44.46 W), situated at 9,358 feet above mean sea level (**Figure 1**). The shoreline is a mix of rocks, willows, and conifer forest. The lake bottom appears to be primarily composed of mud and various-sized rock substrate. When Round Top Lake spills, water drains into nearby Woods Lake and the South Fork American River watershed. The lake receives water from rain and snowmelt runoff from the immediate area. CDFW historically stocked Round Top Lake with fingerling-sized Golden Trout (*Oncorhynchus mykiss aguabonita*; GT), RT, and LCT, with the last recorded stocking of LCT in September 2020. Prior to stocking in 2020, the most recent stocking at Round Top Lake was an allotment of RT in 2018. CDFW currently manages Round Top Lake as a “put and grow” fishery. Round Top Lake is open all year for fishing and other recreational opportunities, but has limited access during the winter season when there is snow.

Fourth of July Lake

Fourth of July Lake is a 15-acre lake in Alpine County (38° 38' 58.28 N, 120° 01' 02.37 W), situated at 8,172 feet above mean sea level (**Figure 1**). The shoreline is a mix of rocks, willows, and conifer forest. The lake bottom appears to be primarily composed of mud and various-sized rock substrate. When Fourth of July spills, water flows into Summit City Creek, eventually contributing to the Mokelumne River. The lake receives water from rain and snowmelt runoff from the immediate area. CDFW historically stocked Fourth of July Lake with fingerling-sized BK, RT, LCT, and Kokanee Salmon (*Oncorhynchus nerka*; KS), with the last recorded stocking of KS in 1982. CDFW currently manages Fourth of July Lake as a self-sustaining BK and RT fishery. Fourth of July Lake is open all year for fishing and other recreational opportunities, but has limited access during the winter season when there is snow.

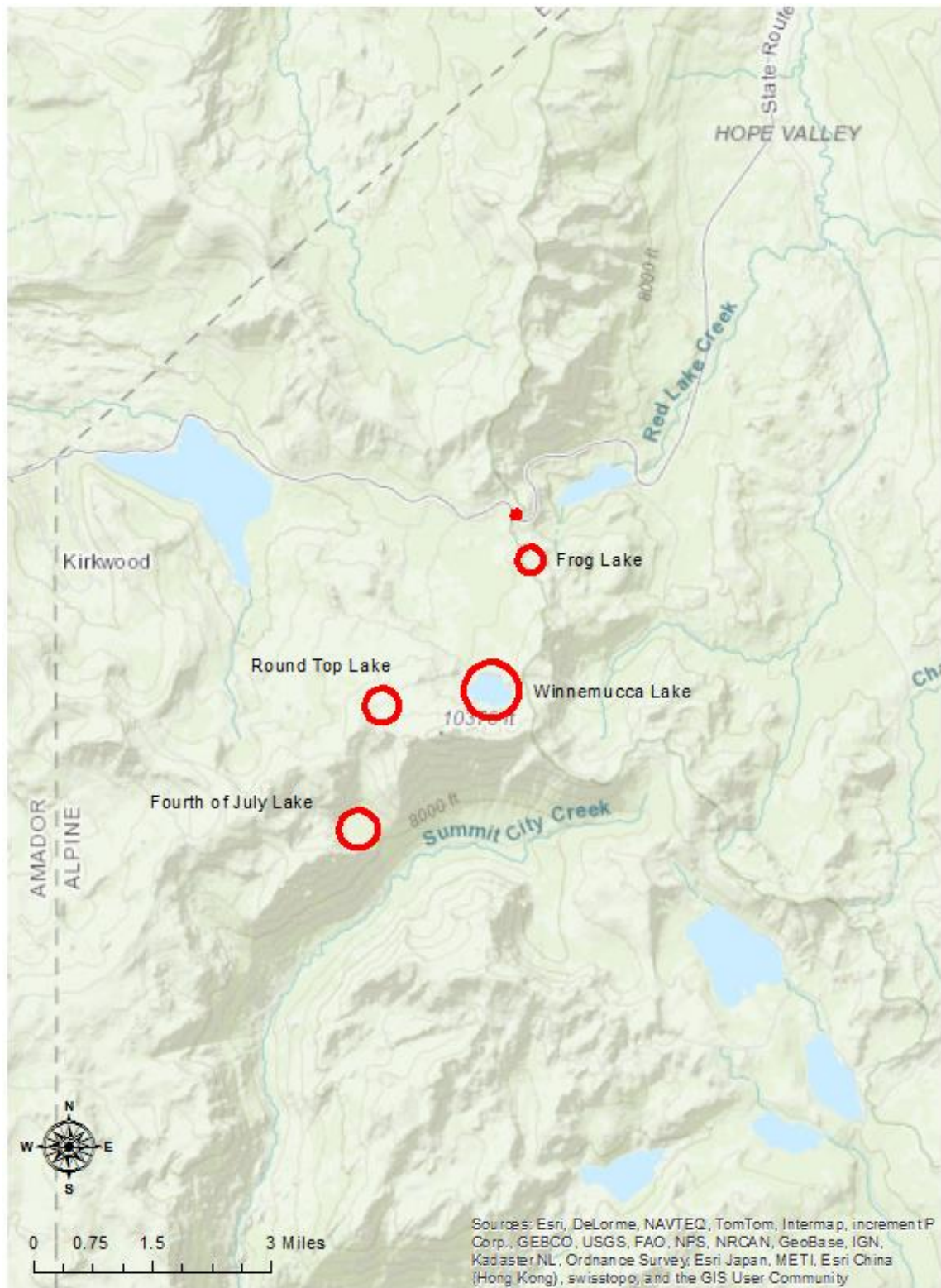


Figure 1. Frog Lake, Winnemucca Lake, Round Top Lake, and Fourth of July Lake (circled in red). Location of the Angler Survey Box is indicated by the red dot.

Methods

The survey asked anglers for information regarding the lake fished, type of gear used, and the number of landed fish. This information was used to calculate catch per angler. Anglers were also asked the size and species of landed fish and whether they kept or released their catch. Lastly, 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 pertained to the level of satisfaction with their overall angling experience, and with the size and number of fish they caught. Anglers were able to use the back of the survey form to include additional comments (**Appendix 1**).

Results

In 2021, 12 anglers responded to the survey, compared to 18 in 2020, 25 in 2019 and 14 in 2018 (**Table 1**). In 2021, 39 fish were caught between the four lakes, compared to 79 in 2020, 69 in 2019 and 28 in 2018. In 2021, the greatest number of fish were caught at Winnemucca Lake (n = 32), compared to Fourth of July Lake (n = 45) in 2020, Frog Lake (n = 36) in 2019 and again Fourth of July Lake (n = 14) in 2018. This is the first time in four years that Winnemucca Lake had the greatest number of fish caught and the highest catch per angler average (4.0).

Table 1. Average catch statistics from the 2018 thru 2021 Angler Survey Box for Frog, Winnemucca, Round Top, and Fourth of July Lakes. NA = Not applicable

Lake	2018			2019			2020		
	Fish Landed	Total Anglers	Catch per Angler	Fish Landed	Total Anglers	Catch per Angler	Fish Landed	Total Anglers	Catch per Angler
Frog	2	4	0.5	36	12	3.0	15	5	3.0
Winnemucca	12	5	2.4	13	11	1.2	19	8	2.4
Round Top	0	1	0.0	0	1	0.0	0	0	NA
Fourth of July	14	4	3.5	20	1	20.0	45	5	9.0
Total	28	14		69	25		79	18	

Lake	2021		
	Fish Landed	Total Anglers	Catch per Angler
Frog	7	4	1.8
Winnemucca	32	8	4.0
Round Top	0	0	NA
Fourth of July	0	0	NA
Total	39	12	

From 2018–2021, anglers used either bait, lures, or flies while fishing these four lakes (**Table 2**). In 2021, one bait angler that fished Winnemucca Lake had a 10.0 catch per angler rate and the highest catch per angler average of the four lakes. In 2021, one angler using multiple gear types at Winnemucca Lake had the second highest catch rate per angler (4.0). However, at Frog Lake, multiple gear type anglers had the highest catch per angler average at that lake (2.0). No anglers reported fishing at Round Top Lake or Fourth of July Lake in 2021. It is also the second straight year that no one reported fishing at Round Top Lake. Similarly, in both 2018 and 2019, only one angler reported fishing at Round Top Lake, and in both years the reporting angler caught zero fish.

Table 2. The frequency of anglers that used each angling method and their corresponding catch rates from 2018 thru 2021.

	Frog Lake		Winnemucca Lake		Round Top Lake		Fourth of July Lake	
	Number of Anglers	Catch per Angler	Number of Anglers	Catch per Angler	Number of Anglers	Catch per Angler	Number of Anglers	Catch per Angler
2018								
Bait	0	NA	2	3.0	1	0.0	0	NA
Lure	3	0.0	1	2.0	0	NA	0	NA
Fly	0	NA	1	2.0	0	NA	4	3.5
Not Recorded	1	2.0	1	2.0	0	NA	0	NA
2018 Totals	4		5		1		4	
2019								
Bait	1	3.0	3	2.7	0	NA	0	NA
Lure	6	2.33	2	0.5	1	0	0	NA
Fly	0	NA	1	0.0	0	NA	1	20.0
Multiple	5	3.8	5	0.8	0	NA	0	NA
2019 Totals	12		11		1		1	
2020								
Bait	0	NA	1	4.0	0	NA	0	NA
Lure	2	3.5	4	0.5	0	NA	4	11.3
Fly	2	2.5	2	5.0	0	NA	1	0.0
Multiple	1	3.0	1	3.0	0	NA	0	NA
2020 Totals	5		8		0		5	
2021								
Bait	1	1.0	1	10.0	0	NA	0	NA
Lure	0	NA	4	3.8	0	NA	0	NA
Fly	0	NA	2	1.5	0	NA	0	NA
Multiple	3	2.0	1	4.0	0	NA	0	NA
2021 Totals	4		8		0		0	

In 2021, for a fourth consecutive year, all landed fish ($n = 39$) measured at Frog and Winnemucca Lakes were less than 16.0 inches (in.) in total length (**Figure 2**) (Ewing 2020). In 2021, the RT modal length class at Frog Lake was 12.0–13.9 in. ($n = 5$), compared to 10.0–11.9 in. ($n = 9$) in 2020 and 8.0–9.9 in. ($n = 12$) in 2019 (Ewing 2020). In 2021, Winnemucca Lake’s BK modal length class was 8.0–9.9 in. ($n = 10$), compared to 6.0–7.9 in. in 2020 ($n = 4$) and 2019 ($n = 9$). In 2021, no fish were reported caught from Fourth of July or Round Top Lakes.

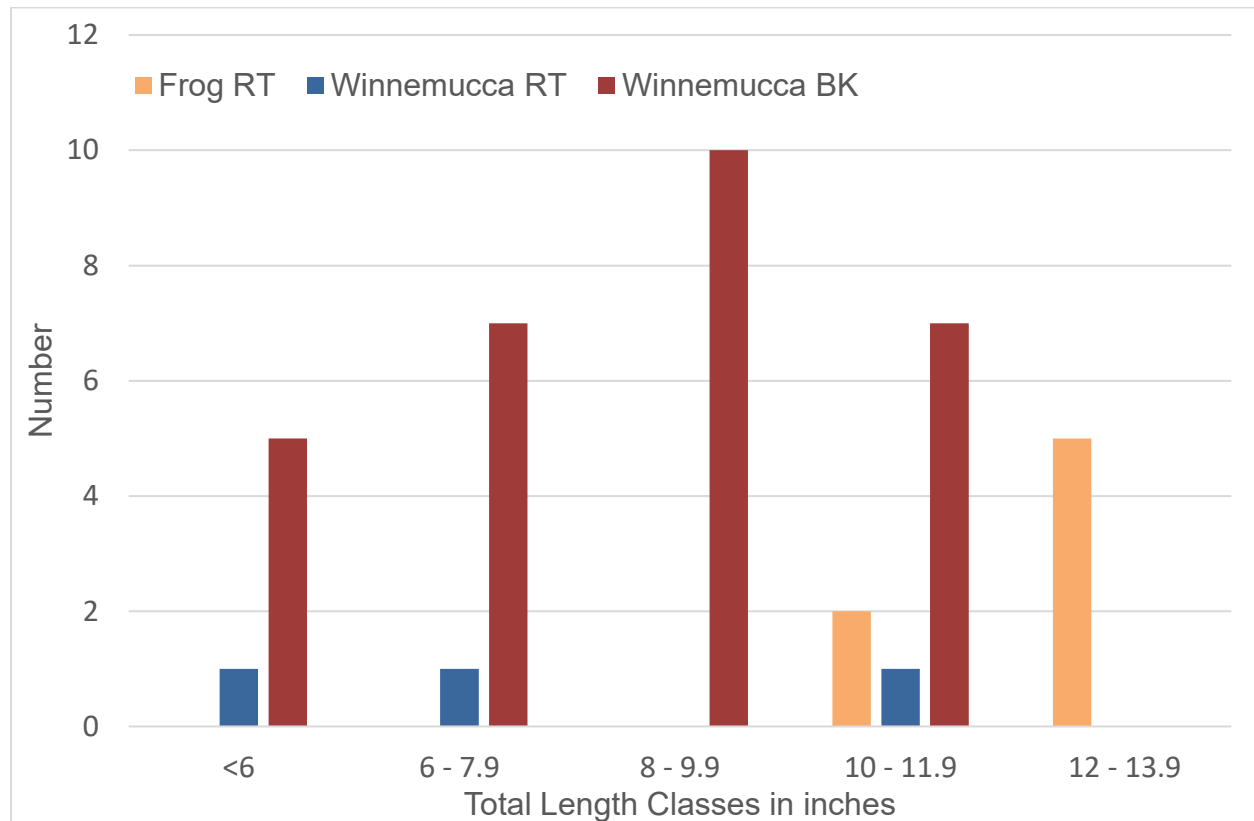


Figure 2. Frequency of fish in each length class that anglers reported landing at Frog and Winnemucca Lakes in 2021.

Of all fish landed in 2021, 24 (61.5%) were released, a decrease from those released in 2020 ($n = 56$) (70.9%), 2019 ($n = 60$) (87.0%), and 2018 ($n = 23$) (82.1%) (Ewing 2019b). In 2021, 20.0% of all RT were kept compared to 28.0% in 2020, 5.7% in 2019, and 66.7% in 2018. In 2021, 44.8% of all BK were kept compared to 29.6% in 2020, 20.6% in 2019, and 4.5% in 2018 (**Table 3**).

Table 3. Kept and released fish from Frog, Winnemucca, and Fourth of July Lakes from 2019 thru 2021.

2019	Kept			Released			Total Percent	
Species	Frog	Winnemucca	Fourth of July	Frog	Winnemucca	Fourth of July	Kept	Released
RT	2	0	0	33	0	0	5.7%	94.3%
BK	0	7	0	1	6	20	20.6%	79.4%
Total	2	7	0	34	6	20		
2020	Kept			Released			Total Percent	
Species	Frog	Winnemucca	Fourth of July	Frog	Winnemucca	Fourth of July	Kept	Released
RT	7	0	0	8	10	0	28.0%	72.0%
BK	0	2	14	0	7	31	29.6%	70.4%
Total	7	2	14	8	17	31		
2021	Kept			Released			Total Percent	
Species	Frog	Winnemucca		Frog	Winnemucca		Kept	Released
RT	2	0		5	3		20.0%	80.0%
BK	0	13		0	16		44.8%	55.2%
Total	2	13		5	19			

In 2021, anglers had a positive average response to their overall fishing experience at Frog and Winnemucca Lakes for a fourth consecutive year and Winnemucca reported its highest value (1.88) on record (**Table 4**). No anglers reported fishing at Round Top Lake for a second consecutive year and no anglers reported fishing from Fourth of July Lake in 2021. Average satisfaction with size and number of fish were also positive for Frog and Winnemucca for a fourth consecutive year, with Winnemucca recording its highest “Number” value on record.

Table 4. Angler satisfaction response averages for Frog, Winnemucca, Round Top, and Fourth of July Lakes from 2018 thru 2021. No average size of fish and number of fish have been calculated for Round Top Lake due to no fish being caught. No satisfaction values were recorded for Fourth of July Lake in 2019 and 2021. No satisfaction values were recorded for Round Top Lake in 2020 and 2021.

2018			
Lake	Overall Angling Experience	Size of Fish	Number of Fish
Frog	2.00	1.00	1.00
Winnemucca	1.80	1.00	1.40
Round Top	1.00	NA	NA
Fourth of July	1.00	0.50	1.25
2019			
Lake	Overall Angling Experience	Size of Fish	Number of Fish
Frog	1.17	0.90	0.90
Winnemucca	0.91	1.20	1.00
Round Top	2.00	NA	NA
Fourth of July	NA	NA	NA
2020			
Lake	Overall Angling Experience	Size of Fish	Number of Fish
Frog	1.75	1.50	1.25
Winnemucca	1.57	1.25	1.25
Round Top	NA	NA	NA
Fourth of July	1.80	-0.50	2.00
2021			
Lake	Overall Angling Experience	Size of Fish	Number of Fish
Frog	1.50	1.33	1.00
Winnemucca	1.88	1.13	1.63
Round Top	NA	NA	NA
Fourth of July	NA	NA	NA

Discussion

The 2021 ASB results indicate anglers caught varying numbers of trout, except at Round Top and Fourth of July Lakes, where no anglers reported fishing. This is also the fourth consecutive year no fish have been caught at Round Top Lake. However, no anglers submitted ASB forms for Round Top Lake in 2020 and 2021. CDFW conducted an angling survey in 2019 in which no fish were caught at Round Top Lake (Ewing

2019a). During the survey, CDFW noticed that a large part of the lake was very shallow. Therefore, portions of Round Top Lake may freeze solid during the winter, and result in some overwinter mortality among RT. CDFW conducted a gill net survey in 2012, during which staff measured a depth of 2.1 meters (6.9 ft.) in Round Top Lake at the ending spot of the 36 meter-long net (CDFW High Mountain Lakes [HML] Database). CDFW stocked 500 LCT into Round Top Lake in 2020, half the number of the last stocking in 2018. CDFW made the decision to reduce the stocking allotment given the reduced overwintering habitat and resources available for fish.

In 2021, anglers caught the greatest number of fish at Winnemucca Lake ($n = 32$). Winnemucca Lake also had the highest catch per angler value (4.0) for the first time in four years. The high catch rate may be because Winnemucca Lake contains large numbers of stunted BK, which compete for a limited amount of resources. The limited available resources likely increases the aggressive feeding behavior in the fish. CDFW has not stocked Winnemucca Lake since 2000, during which staff stocked RT. The BK and RT anglers reported catching from 2018 thru 2021 suggest that Winnemucca Lake contains self-sustaining populations of RT and BK.

In 2021, anglers caught the second highest number of trout ($n = 7$) at Frog Lake. The lake now appears to mainly contain a hatchery supplemented RT population even though Frog Lake received 1000 fingerling-size LCT in 2020. CDFW recently added Frog and Round Top Lakes to the statewide stocking allotment, receiving aerial fingerling stockings in 2017 and 2018, while funding and mechanical issues with the plane resulted in a shift to stocking fish by horse and backpack in 2020 and 2021, with no fish stocked in Round Top Lake in 2021. Subsequently, the number of fish anglers reported catching at Frog Lake increased from two in 2018 to 36 in 2019. Although the number of fish anglers reported catching at Frog Lake decreased to 15 in 2020 and 7 in 2021, the 2021 catch per angler value is still a relatively positive value. It is also possible that the nearby fires in 2021 not only prevented anglers from legally fishing Frog Lake, but negatively affected the fishery. Although total catch and catch per angler values were down from previous years at Frog Lake, the results are still encouraging for the fishery. Due to the recent ASB results, CDFW will likely maintain the same stocking allotment at Frog Lake. However, CDFW may stock either RT or LCT into Frog Lake, depending on which species is available at the planned stocking time. In 2020, no RT were available so CDFW stocked LCT instead. As previously mentioned above, Round Top Lake appears to have poor catch rates and little to no angler usage. Therefore, CDFW reduced the allotment to 500 LCT in 2020, in hopes of lowering competition for food and habitat. CDFW will continue to monitor the Round Top Lake fishery and decide on future management practices.

In 2021, one angler using bait at Winnemucca Lake had the highest catch per angler of both lakes in which fish were reported caught. 2021 was also the first year

during which anglers had the highest catch per angler values at Winnemucca Lake. In 2021, multiple-gear anglers at Winnemucca Lake also had the second highest catch per angler value of the two lakes. Historically, Winnemucca Lake has received a fair amount of angler usage and fair number of fish caught. With Winnemucca Lake being the largest and deepest of the four lakes surveyed, it is possible the fishery wasn't as negatively impacted as the other three lakes. It is unknown the reasoning why anglers chose not to fish Fourth of July or Round Top Lakes in 2021, but the Tamarack and Caldor Fires that burned much of the surrounding area for much of the summer season likely did not help increase angler usage. In 2018, 79% of all fish anglers caught from all four lakes were BK. In 2019, 51% of all fish anglers caught were RT and 49% were BK. In 2020, 32% of the catch was RT and 68% BK. In 2021, 26% of the total catch reported by anglers was RT, while 74% of the reported catch were for BK. The large percentage of BK caught may have resulted from CDFW not stocking RT into Frog Lake in 2019. When stocked annually, Frog Lake appears to have a successful put and grow fishery. Future years' of ASB surveys may provide a more accurate representation of the fishery for both Frog and Round Top Lakes. These ASB results will assist with management changes (i.e. adjusted allotments) (**Appendix 1**).

The greatest number of RT anglers caught from Frog Lake were in the 12.0–13.9 in. length class ($n = 5$), followed by 29% ($n = 2$) in the 10.0–11.9 in. length class, indicating growth from the fingerling-sized stockings. Similar to 2018 and 2020, most of the BK anglers caught in 2021 were under 10.0 in., which may explain why anglers continue to release the majority of BK caught (2018=95.5%, 2019=79.4%, 2020= 70.4%, and 2021=55.2%). In 2018, anglers kept approximately 67% of RT, which decreased to 5.7% in 2019, increased to 28.0% in 2020, then decreased to 20.0% in 2021. Similar to 2020, most RT caught in 2021 were over 10.0 in., which may explain why anglers released fewer RT when compared with 2019, during which most RT caught were under 10.0 in. Winnemucca and Fourth of July Lakes are self-sustaining fisheries, with no supplemental stockings. All fish caught in 2018, 2020, 2021, and 97% of fish anglers caught in 2019, were less than 14.0 inches. These results may suggest that populations in the self-sustaining Winnemucca and Fourth of July Lakes don't have trophy-sized fish. Furthermore, these results may suggest that fish stocked into Frog Lake may need more time to grow. The stockings at Round Top Lake don't appear to show any success and barring any changes, will likely stop receiving stockings in the future. Trout in Winnemucca and Fourth of July Lakes may be limited in their growth due to population density and biomass, both of which can vary with landscape variables, such as surficial geology, catchment area, and land use (Blann 2000, 2004; Nerbonne and Vondracek 2001; Zimmerman et al. 2003). For a third consecutive year, it appears that anglers are catching larger-sized trout from Frog Lake. The fingerling-sized stocked fish can overwinter at Frog Lake and grow to nice, catchable-sized fish.

The primary objective when managing recreational fisheries is often to improve the quality of fishing or optimize human benefit (Pollock et al. 1994; Weithman 1999). In 2021, anglers were satisfied with their overall fishing experience at all lakes in which they fished (i.e., excluding Fourth of July and Round Top Lakes). Anglers were also satisfied with the size and number of fish they caught at Frog and Winnemucca in 2021, marking the fourth consecutive year both of these waters had positive “size” and “number” average values. With catch rates of 4.0 fish per angler and fish caught up to 16 inches out of these two lakes in the last four years, it is not surprising to see such a positive feedback on these satisfaction values.

Future ASB data will continue to help inform trends in angler satisfaction related to the size and number of landed trout. The size and number of trout anglers caught at Frog and Winnemucca Lakes may have played a large role in the positive overall fishing experience value reported by anglers. However, angler trip satisfaction can also be influenced by factors other than fishing success (McCormick and Porter 2014). For some anglers, satisfaction with the overall fishing experience may have been due less to the fishing itself, and more to outside factors, such as weather, fishing access, lack of crowds, and scenery.

The number of respondents in 2021 ($n = 12$) was the lowest on record (2018, $n = 14$), (2019, $n = 25$), and (2020, $n = 18$). The fire restrictions and camping bans in the Eldorado National Forest during much of summer and early fall 2021 may have deterred potential anglers. Ideally, the more respondents, the more feedback it provides CDFW on angler success at the fisheries. It is essential CDFW maintain the trend of increasing angler participation in the ASB survey. The goal of increasing angler participation may be accomplished by personal communication around Alpine County. Given that 2018 was the first implementation year of the ASB at the Carson Pass, anglers may still be getting reacquainted with the fisheries and ASB program. Additionally, more anglers are becoming aware of recent fish stockings at Frog and Round Top Lakes, which may help increase angling activity and lead to more ASB respondents.

Recommendations

- When possible, CDFW should continue to encourage anglers to fill out the ASB forms.
- Collect a minimum of five years' worth of ASB data to look at fishery trends over time. Data will help CDFW gather more accurate information on the Carson Pass Trail fishery.
- Continue to stock Frog Lake for at least the next five years and Round Top Lake one more year and evaluate before stocking again.

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Appendix 1.

The California Department of Fish and Wildlife is conducting an evaluation of the fisheries at Frog, Winnemucca, Round Top, and Fourth of July Lakes. We request your help in this evaluation by providing the following information in this survey. Please use this form for one day's fishing at the specific lake by one angler only.

Circle the Lake fished at:

Frog Winnemucca Round Top Fourth of July

Date Fished: _____
mm/dd/yyyy

Primary gear type used (check one):

☐ Lure ☐ Bait ☐ Fly

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

Size	Rainbow trout		Brook trout	
	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"-21.9"				
22"-23.9"				
24"-25.9"				
>26"				

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

	Least satisfied		Most satisfied	
Overall angling experience today:	-2	-1	+1	+2
Size of fish:	-2	-1	+1	+2
Number of fish:	-2	-1	+1	+2

Please use the back of this form for any additional comments. Thank you for helping us manage and protect California's fisheries.

