

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

Red Lake, Alpine County

2011-2016 Angler Survey Box Analysis



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Introduction

Red Lake is an 85 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.

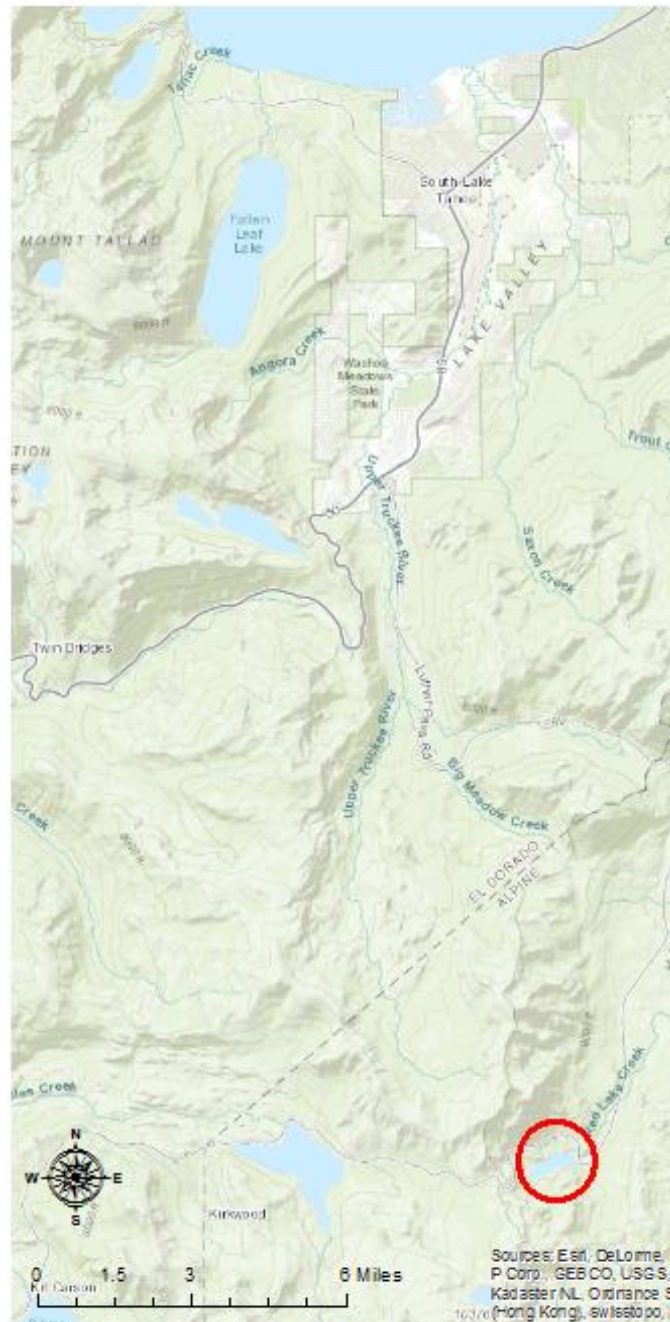


Figure 1. Red Lake, Alpine County.

Red Lake 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). 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 Red Lake (Figure 2). Anglers voluntarily complete 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 Red Lake. This report covers the data collected from Red Lake's ASB from 2011-2016.

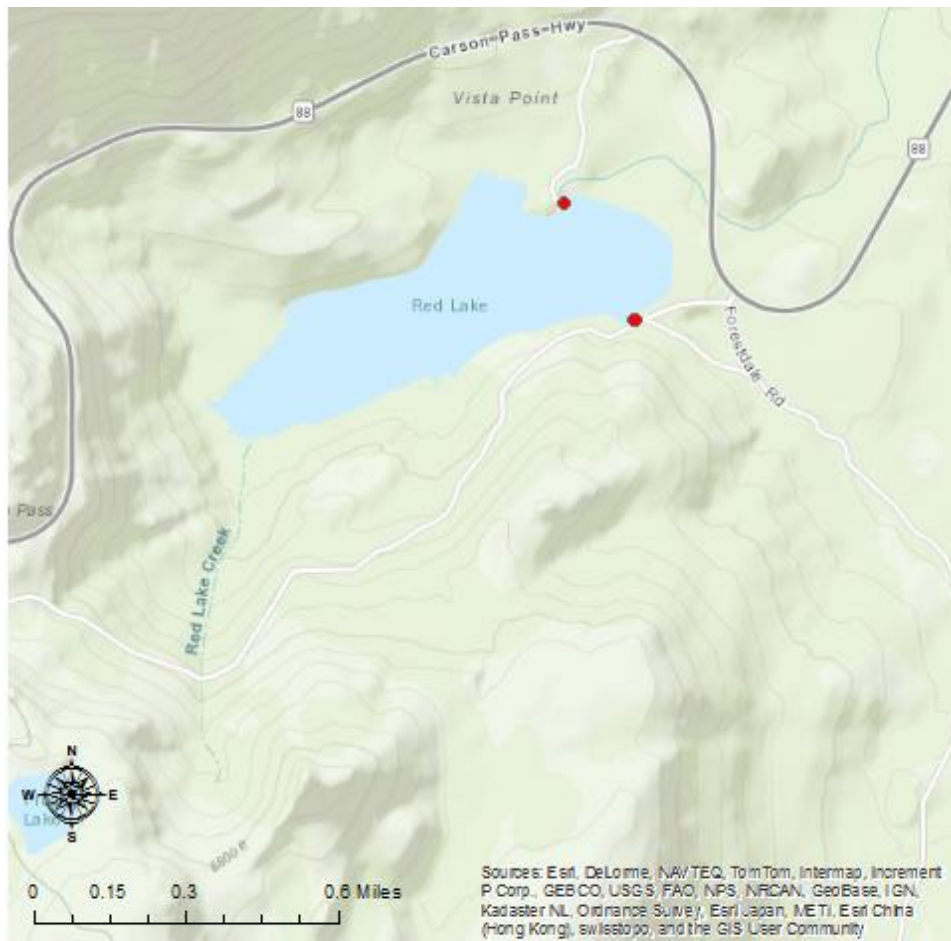


Figure 2. Red Lake ASB Locations, Alpine County.

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 is reserved for anglers who have any additional comments.

Results

In 2016, Red Lake had 116 respondents, which was above the average of 62 (37 - 116) anglers who responded to the survey (Table 1) and the highest in the six year survey period. Cumulatively, these anglers landed a total of 211 fish and logged 423.50 fishing hours in 2016, which is also above the six year average of 209.69 hours and 168 fish landed. The catch per angler and catch per hour in 2016 of 1.82 and 0.50 decreased from the average of 2.88 and 0.88, respectively over the six year period.

Table 1. Collection of average effort and catch statistics recorded from the Angler Survey Box from 2011 - 2016 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	181.50	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
Average	62	209.69	168	2.88	0.88	3.35

A total of four anglers (3.4%) reported fishing from boat, which resulted in the best success in terms of catch per angler (2.50 fish/angler) in 2016 (Table 2). A total of 102 anglers (87.9%) reported fishing from shore or by wading, which resulted in the second best success in terms of catch per angler (1.81 fish/angler) in 2016. Anglers who did not record their method of fishing had a higher catch per angler (2.29 fish/angler), but it is not known how these fish were taken. 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 (2.64 fish/angler) in 2015 (Table 2). It was also the most popular method of fishing in 2015. The least used method in 2015 and 2016 was float tube fishing, which had the least catch per angler at 0.00 both years.

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

Method	2011 - 2014		2015		2016	
	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
Float tube	25 (13%)	3.92	1 (1.5%)	0.00	1 (1.0%)	0.00
Shore/Wading	142 (75%)	3.04	58 (87.9%)	2.64	102 (87.9%)	1.81
Multiple	NA	NA	NA	NA	2 (1.7%)	0.00
Not recorded	7 (4%)	4.00	5 (7.6%)	2.80	7(6.0%)	2.29
	190		66		116	

Anglers used bait, lures, and flies while fishing at Red Lake (Table 3). In 2016, 61 anglers (52.6%) used bait to catch fish, which was an increase from 2011 – 2014 (40.3%), but down from 2015 (72.7%). The least frequent identified method in 2016 was the fly method (4.3%), which decreased from the 2011 – 2014 average of 8.4%, but increased from 2015 (1.5%). Lure anglers had the highest catch rate (2.59 fish per angler) in 2016, which was higher than 2015 (1.45 catch per angler), but lower than the average for 2011 – 2014 (3.63 catch per angler). Bait method anglers had the second highest identified catch rate in 2016 (1.79 fish per angler), which is a large decrease from 2015 (3.06 catch per angler) and the 2011 – 2014 average (2.38 catch per angler). In 2016, fly anglers had the lowest catch rate (0.80 fish per angler), an increase from 2015 (0.00 fish per angler), but 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 - 2016.

Angling method	2011 - 2014		2015		2016	
	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
Lure	54 (28.3%)	3.63	11 (16.7%)	1.45	27 (23.3%)	2.59
Fly	16 (8.4%)	6.31	1 (1.5%)	0.00	5 (4.3%)	0.80
Multiple	40 (20.9%)	2.78	4 (6.1%)	0.75	22 (19.0%)	1.18
Not recorded	4 (2.1%)	1.00	2 (3.0%)	2.00	1 (0.9%)	2.00
	191		66		116	

In 2016, anglers managed to catch more fish (n = 211) than every year except 2013, in which 224 were reported caught (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. In 2016, 84% of

identifiable trout landed were LCT, eight percent were BK, and eight percent were a combination of unknown trout/species. 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 native/wild mountain whitefish (*Prosopium williamsoni*) were caught (Onanian 2014).

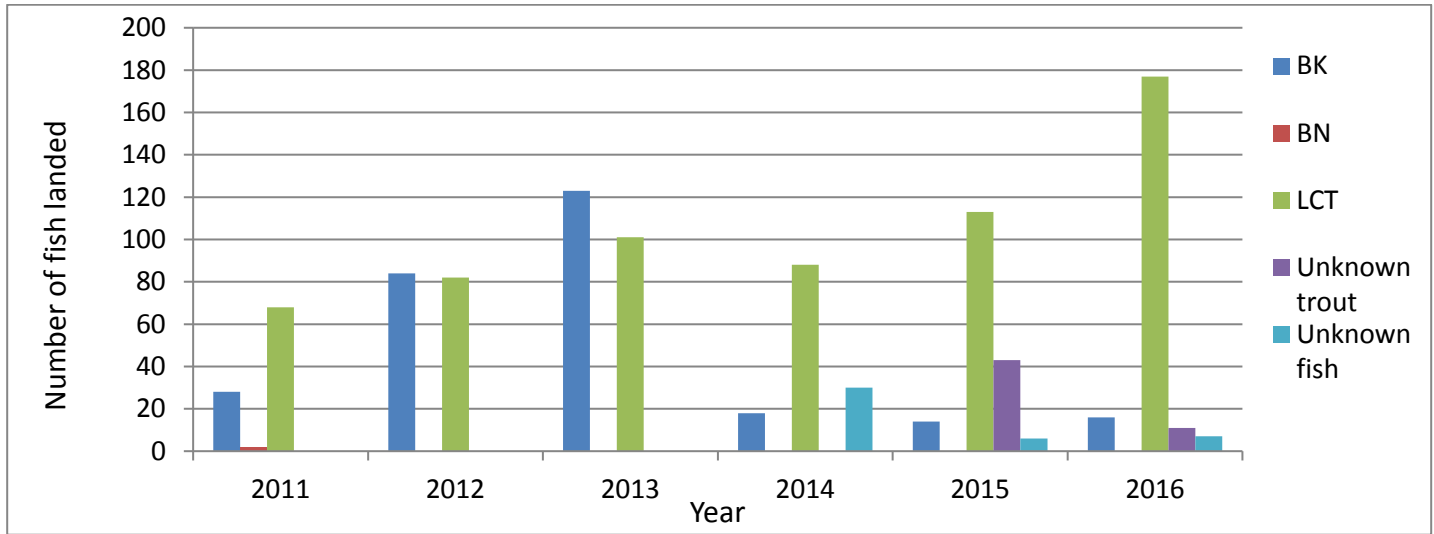


Figure 3. Number of each species of fish caught annually from 2011 through 2016 at Red Lake.

The 2011 – 2014 ASB data showed that 72% (428 fish) of the landed trout measured less than 10 inches in total length (Figure 4) which decreased to 24% of the total in 2015 and 22% in 2016. 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. Only three, two, and four percent of fish caught were greater than 20 inches in 2011 – 2014, 2015, and 2016 respectively.

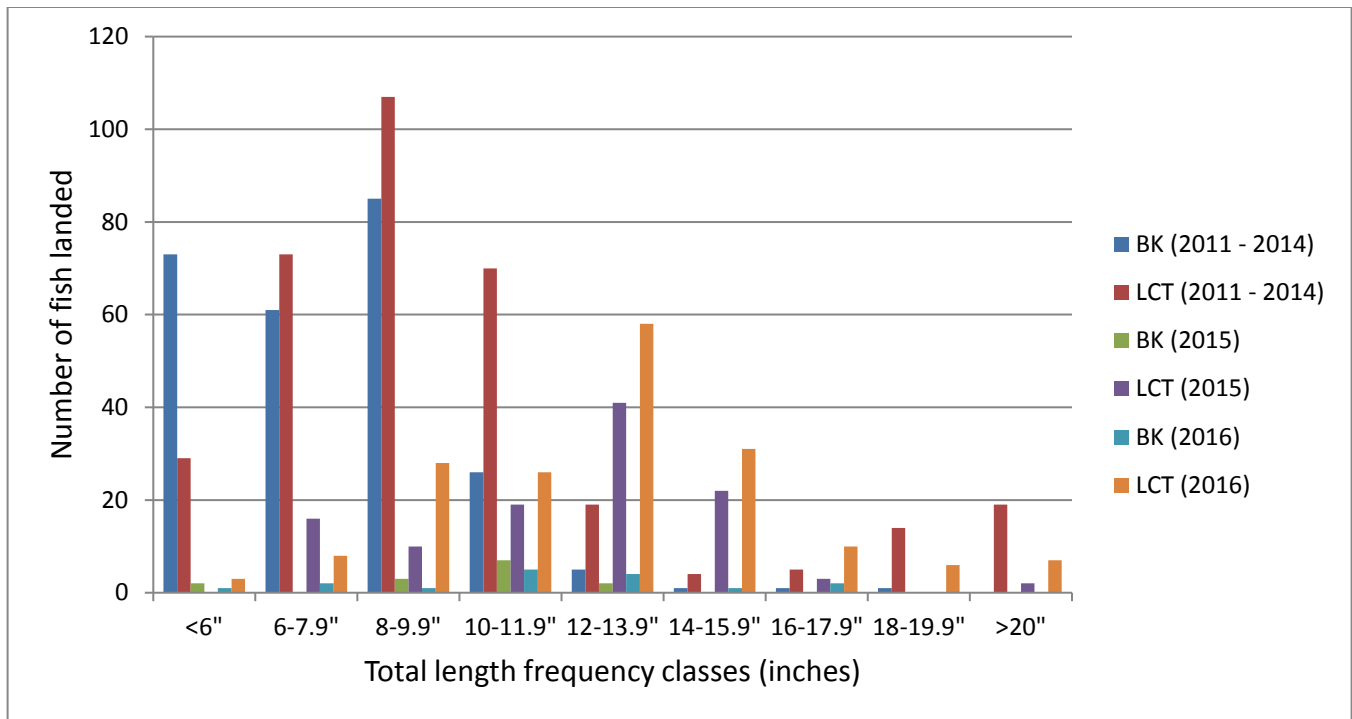


Figure 4. Frequency of identified trout in each size class that anglers reported landing on Red Lake from 2011-2016.

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 the BK were released compared to only 12% of LCT released. In 2016, 50% of the BK were also released while 38% of LCT were released.

Table 4. Data on kept and released trout in Red Lake from 2011 - 2016.

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		

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

In 2016, anglers reported being less satisfied with their overall angling experience than any previous year (Tables 5). Anglers had a positive average angling experience response all six 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 second consecutive year in six years. Anglers were satisfied with the number of fish caught for a fourth consecutive year.

Table 5. Angler satisfaction response averages for the Red Lake fishery from 2011 through 2016.

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

Discussion

Data gathered from the Red Lake ASBs have shown anglers have caught almost three fish a day on average when fishing at Red Lake over the last six years. Overall, catch in 2016 was the second highest (n=211) in six years, but CPUE was at an all-time low of 1.82 fish per angler. It is possible the higher number of trout was a function of a greater number of anglers responding to the survey. The decrease in CPUE may be attributed to the reduced LCT stocking in 2013 - 2015 that resulted from losses of LCT during hatchery production. The 2013 season had the greatest catch rates and satisfaction and may have resulted from the 2012 LCT stocking that included a substantial number of sub-catchable and fingerling fish. The greatest percentage of anglers fished from shore, but boat anglers had the greatest catch per angler in 2016. It is possible that boat anglers in 2016 had better access to where the fish were than anglers from shore due to various environmental reasons such as snow, water levels, vegetation abundance, and/or limited shoreline access.

The greatest number of trout caught in 2016 were in the 12 - 13.9 in. size class for a second consecutive year. This corresponds with the second highest "size" satisfaction value of anglers in six years. Prior to 2015, anglers were unsatisfied 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. Anglers have been satisfied with the numbers of trout caught the last four years. It is often difficult to manage a fishery to satisfy both high catch rates and large size of fish caught but in 2015 and 2016 it was accomplished for the second consecutive time in six years. CDFW has stocked broodstock (2lbs) LCT from Heenan Lake into Red Lake for over 20 years, but anglers are not reporting catching many of these larger fish, as only 28 LCT over 20 inches were caught and reported in the last six years. However, seven of the 28 LCT were caught in 2016, which is an improvement. 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 broodstock

LCT could potentially be swimming downstream, due to the fact that they are stocked during their spawning season. CDFW will look into transferring this broodstock allotment into another nearby water because private property limits angler access to Red Lake Creek.

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 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. Again in 2016, 50% of the BK were released compared to 38% of LCT released. 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 stockings 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 overall fishing experience responses have decreased the last three years, averaging 0.73 in 2013. One reason anglers are generally satisfied is because most anglers are catching fish. After a complete trip anglers caught an average of over two and a half fish per person over the six year average.

The number of respondents in the 2016 survey was the highest in six years. Ideally, the more respondents, the more feedback it provides CDFW of angler success at the fishery.

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

