State of California
Department of Fish and Wildlife

New Spicer Meadow Reservoir General Fish Survey
Spring, 2013

By

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Summary

In an effort to evaluate the fishery of New Spicer Meadow Reservoir (Spicer), a general fish survey was conducted on May 7 and 8, 2013 by the Department of Fish and Wildlife (Department). For the survey, a 100 foot variable-size gillnet combined with hook and line angling were used to collect fish. Fish collected during the survey included brook trout (BK) (*Salvelinus fontinalis*), rainbow trout (RT) (*Oncorhynchus mykiss*), Lahontan cutthroat trout (LCT) (*Oncorhynchus clarki henshawi)*, golden shiner (GSH) (Notemigonus *crysoleucas)*, and speckled dace (SD) (*Rhinichthys osculus).* After the survey was conducted, Spicer was determined to have a productive recreational fishery with a diversity of salmonids available, including a successful fingerling RT plant stocking program. These RT grow out to catchable sizes and look and fight like wild fish due to time spent in the reservoir instead of a hatchery. This spring's data along with future efforts will be used to monitor the status of this fishery.

Introduction

The objectives of this survey were to:

- **Determine fish species composition**
- **Determine RT age class distribution**
- **Determine age/growth of trout**
- **Create baseline indices with which to compare future surveys**

Spicer is formed by New Spicer Dam on Highland Creek (NCPA 2012), small tributaries, and additional water which is diverted from the North Fork Stanislaus River. Spicer is in southeastern Alpine County, California, 39 miles south of South Lake Tahoe (Figure 1).

Spicer is owned by Calaveras County Water District (CCWD), operated by Northern California Power Agency (NCPA) and permitted by the U.S. Department of Agriculture and U.S. Forest Service. The lake is operated under Federal Energy Regulatory Commission (FERC) Project 2409 with water being used for electric power and recreation.

Spicer sits at an elevation of approximately 6,614 feet above mean sea level. In 1990, CCWD replaced Pacific Gas and Electric's old dam on Spicer Meadow Reservoir with a new one. The new dam increased maximum pool the lake from 215 surface acres and 4,062 acre-feet to 2,000 surface acres and 189,000 acre-feet of water storage (NCPA 2012). Spicer has historically had and currently has a fishery including BK, GSH, brown bullhead (BBH) (*Ameirus*

nebulosus), and hatchery and wild RT (CDFW Fish Files 1991).

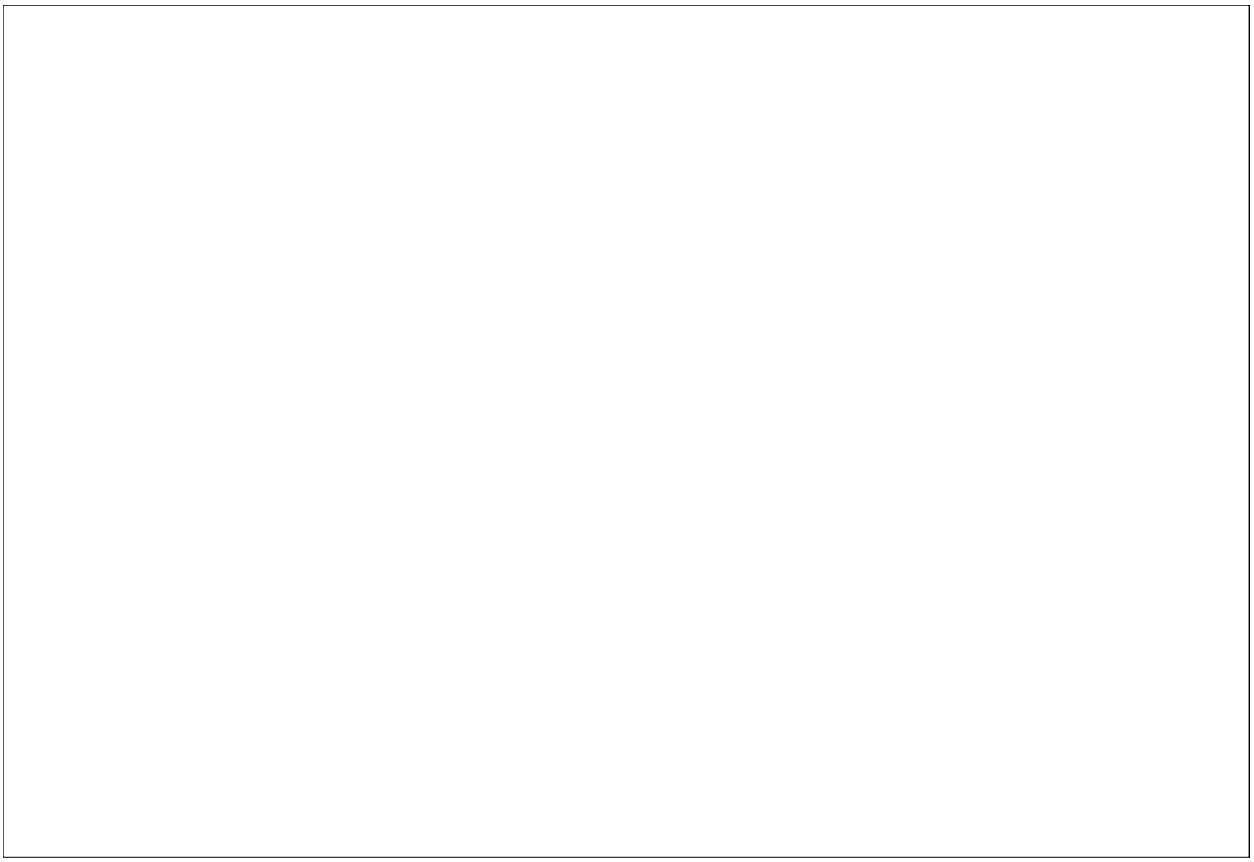


Figure 1. Map of New Spicer Meadow Reservoir in relation to South Lake Tahoe to the north, Alpine County to the right of the county line, and Tuolumne County to the left.

Methods and Materials

In order to collect information on the growth rates of RT of a given age, the Department collected total lengths and scale samples from RT. A sample size of 40 RT measurements was deemed by the Department as reliable for age/growth comparisons. Collection of scale samples would be accomplished by a combination of angling and gillnetting over a specific amount of time.

On May 7, 2013 a 100 foot variable-size gillnet was set in the southwest part of Spicer from 18:05 until 07:40 on May 8 (13.58 hours) (Figure 2). The net was set perpendicular to the lake shoreline, extending from shoreline habitat approximately 10 feet (3 meters (m)) into the middle of the lake at a depth of 25.9 ft. (7.9 m).

On May 7, California Department of Fish and Wildlife (Department) staff and a volunteer

hook and line sampled from a roving boat from 15:45 until 19:27.

The mean length for each species, length ranges and catch per unit effort (CPUE) was determined for each species collected.

Figure 2**.** Gillnet transect location for the New Spicer Meadow Reservoir general fish survey May 7 -8, 2013.

Catch Per Unit of Effort

Catch per unit effort is defined as the number fish collected per hour of gillnet set and angling time. The data was used to estimate (CPUE) for all species combined and for individual species.

CPUE = N/M

where:

N = total number of collected or the total number of a specie and

M = number of hours actually spent angling or gillnet was active in the water

Results

Table 1 summarizes the species composition, mean total length, and length ranges for species collected gillnetting. A total of 37 fish representing five species were collected during the gillnet set (Table 1).

Table 1. Species composition May 7-8, 2013 gillnet set at New Spicer Meadow Reservoir. **Mean Total Length (TL) was measured in millimeters (mm).**

	Species	Number	Percent	CPUE	(TL)	Length Ranges
1	Speckled dace	17	45.9%	1.25	137.5	90 - 197
2	Rainbow trout	14	37.8%	1.03	283.6	192 - 382
3	Golden shiner	3	8.1%	0.22	120.0	NA
4	Lahontan cutthroat	2	5.4%	0.15	262.5	235 - 290
5	Brook trout	1	2.7%	0.07	320.0	NA
	Total	37				
	Gillnet hours:	13.6				
	CPUE (Fish/ hr)	2.72				

Speckled dace (Figure 3) comprised over 45 percent of the total fish sampled.

Figure 3. Speckled dace collected at New Spicer Meadow Reservoir on May 8, 2013.

Rainbow trout followed with 37.8 percent of the total fish sampled. Golden shiner and LCT finished with 8.1 and 5.4 percent respectively (Figures 4 and 5).

Figure 4. Golden shiner collected at New Spicer Meadow Reservoir on May 8, 2013.

Figure 5. Lahontan cutthroat trout collected at New Spicer Meadow Reservoir on May 8, 2013.

Brook trout finished with 2.7 percent of the total catch. The total CPUE for this survey effort was 2.72 fish/hr.

Speckled dace

As seen in Table 1, SD total length ranged from 90 – 197 mm (3.5 – 7.8 in.). The length frequency distribution for SD is presented in Figure 6. The length class with the highest frequency was the 140 mm (5.5 in.) class. This indicates there are numerous SD that are abnormally large compared to other water. Moyle (2002) found that SD reach 20 – 30 mm SL (0.7 – 1.2 in.) by the end of their first summer, and in subsequent years they add, on average, 10 - 15 mm/year (0.4 – 0.6 in./year) to their length with the largest in a Lake Tahoe survey measuring 85 mm (3.3 in.) FL.

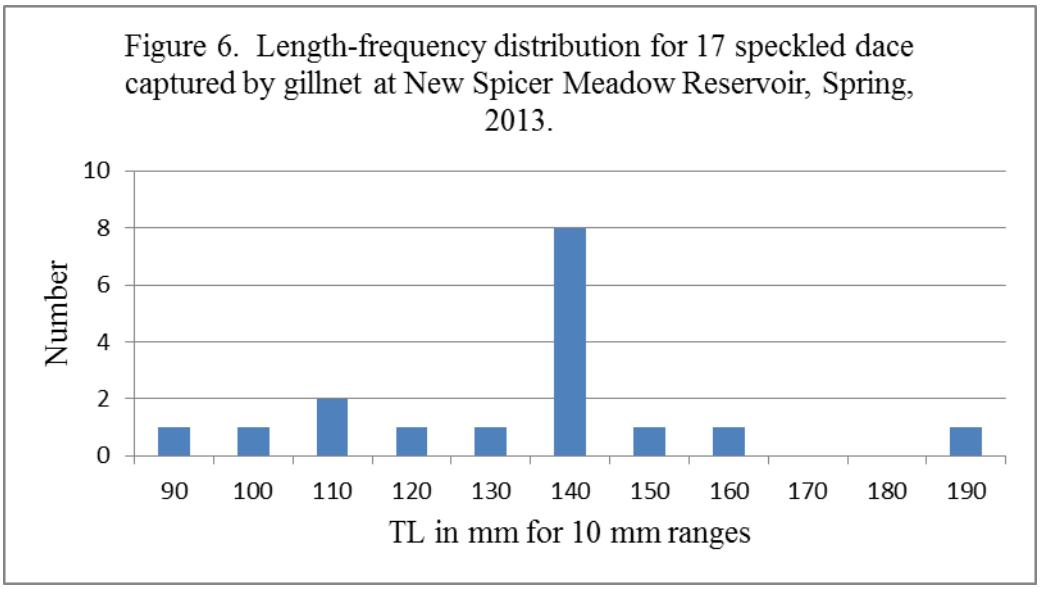


Figure 6. Length-frequency distribution for 17 speckled dace captured by gillnet at New Spicer Meadow Reservoir, Spring, 2013.

Rainbow trout

Rainbow trout total length collected from gillnetting (n = 14) and angling (n = 5) ranged from 192 – 382 mm (7.6 – 15.0 in.). The length frequency distribution for RT is presented in Figure 7. The length classes with the highest frequency were the 225 mm (8.9 in.), 300 mm (11.8 in.), and 350 mm (13.8 in.) classes.

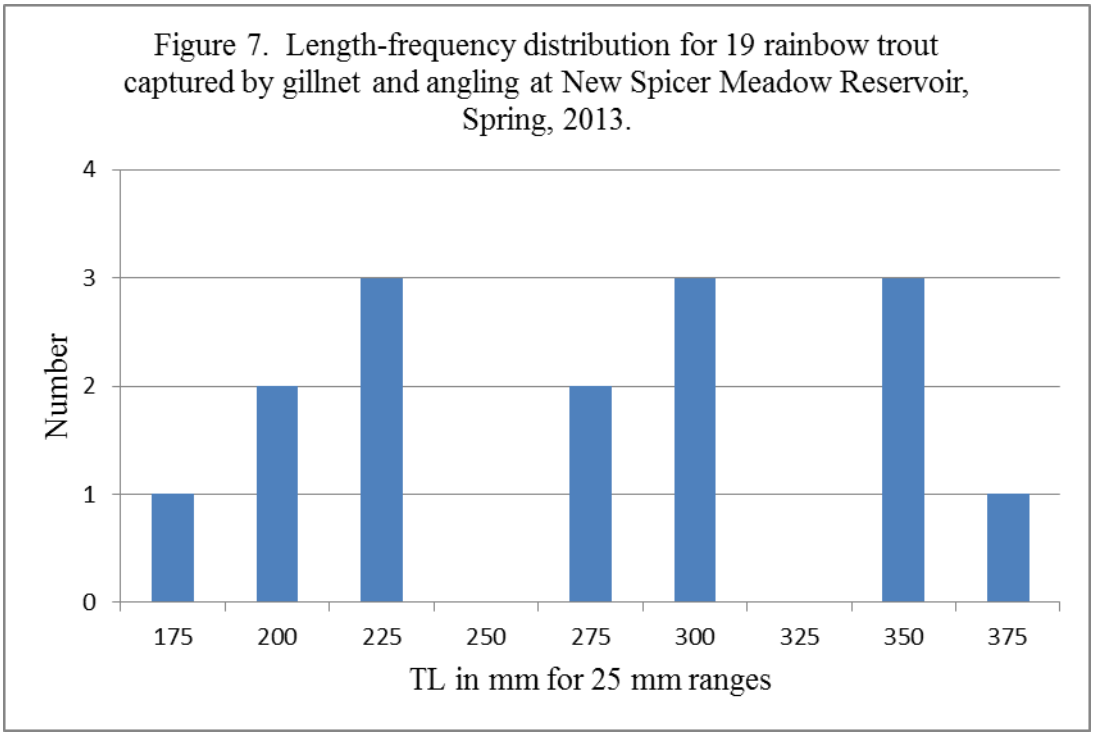


Figure 7. Length-frequency distribution for 19 rainbow trout captured by gillnet and angling at New Spicer Meadow Reservoir, Spring, 2013.

Table 2 summarizes the mean total length and ages of RT collected by both sampling methods. A total of 19 RT were collected, measured and scales collected. Mean total length of these RT was 292.0 mm (11.5 in.). Mean age of these RT was 3.0 years of age. Figure eight is a picture of one of the RT scale samples aged at three years.

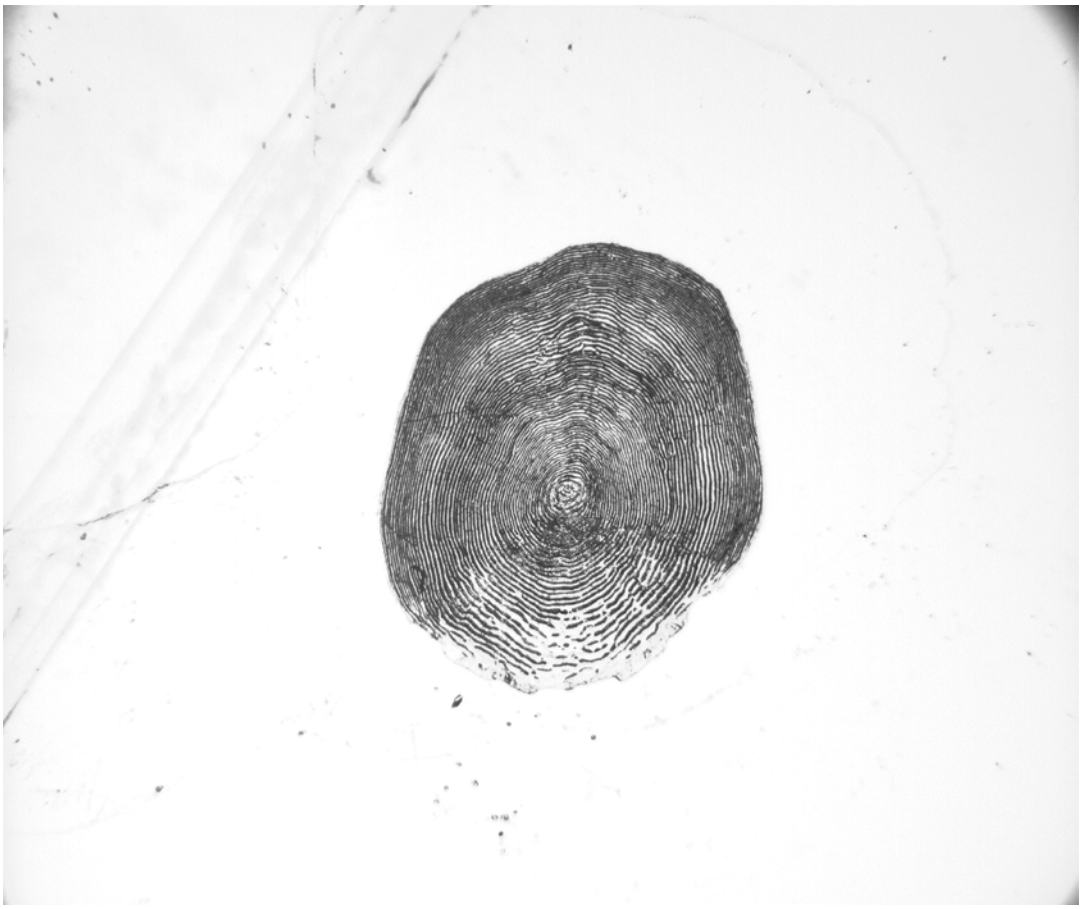


Figure 8. Scale sample of three year old RT collected from New Spicer Meadow on May 8, 2013.

Total lengths ranged from 192 – 300 mm (7.6 – 11.8 in.). The CPUE of the five RT and one BK caught by angling was 3.7 fish/hr.

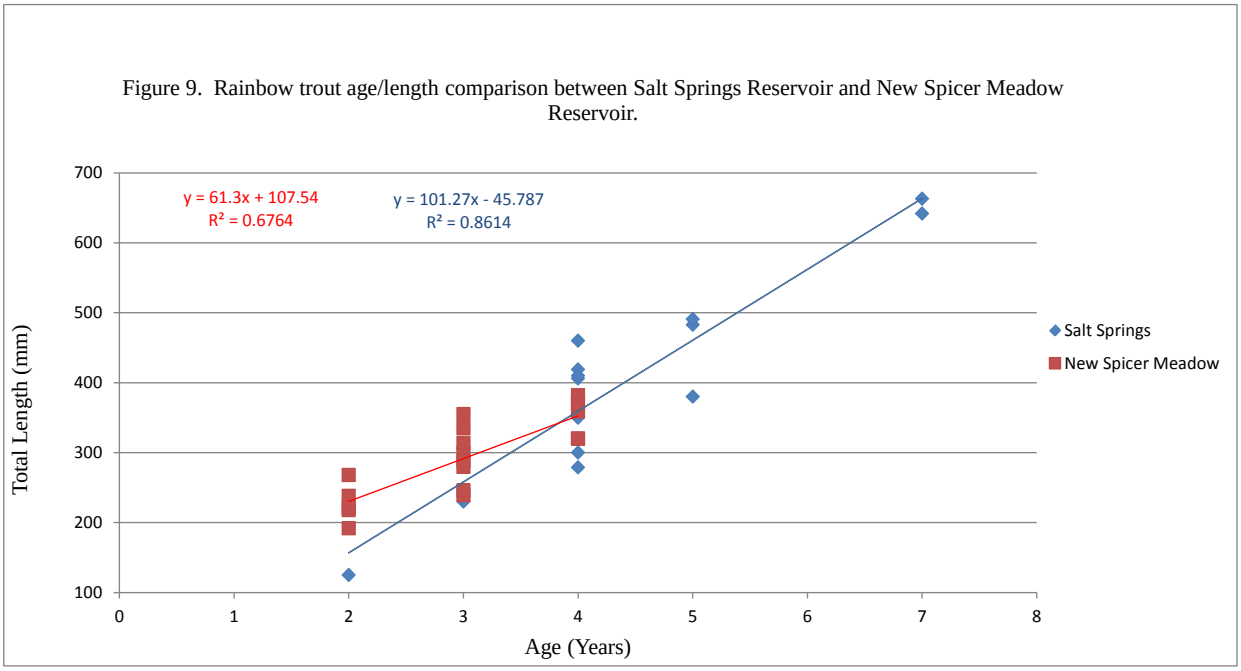
Table 2. Mean total length and age for RT collected from hook and line angling and gillnet set by CDFW staff and volunteer at New Spicer Meadow Reservoir, May 7 and 8, 2013.

	Species	Number	Mean total length (mm)	Mean Age (yrs)
1	Rainbow trout	19	292.0	3

Figure 9 presents an age/length comparison with regression line for RT from Spicer and

Salt Springs Reservoir (Salt Springs) (Amador County).

Figure 9. Rainbow trout age/length comparison between Salt Springs Reservoir and New Spicer Meadow Reservoir.



Golden shiner

As seen in Table 1, only three GSH were collected with all of them being 120 mm (4.7 in.) total length. These fish are likely between one and two years of age (Moyle 2002).

Conclusions

Unfortunately, the survey did not yield the 40 trout minimum sample size that was requested by the Department staff that would be reading the scale samples. Conducting more surveys through angling and gillnetting would have likely yielded more RT. Having more RT to age could have increased our R^2 value for Spicer. With only 19 samples collected and an R^2 value of 0.67, determining an age from a given total length is not reliable for Spicer. In comparison, although the minimum number of trout was not collected for Salt Springs, a R^2 value of 0.86 for the 14 trout that were measured and aged makes estimating the age of a trout reliable if given a specific total length. The growth rates of Spicer RT appear slower than Salt Springs RT after two years of age with the given data. Since Salt Springs RT are all wild with no hatchery-raised RT and a smaller population than Spicer, growth rate is likely higher in Salt Springs due to less competition with other fish for food and habitat (Kundargi, Pers. Comm. 2013). Having larger RT sampled from Spicer might have changed the slope of the linear

regression line. A better comparison would have likely been made to the larger RT from Salt Springs (Figure 8). Spicer RT also appeared to have a slower growth rate than RT seen from Eagle Lake (Lassen Co. CA). The Eagle Lake strain RT were 430 – 460 mm TL at two years old and those 460 – 560 mm TL were three years of age (Moyle 2002).

Due to the lack of suitable sample sizes for the LCT and BK collected during the survey, no summaries were made since the results would be inconclusive. Although there was a lack of a suitable sample size for LCT to draw a summary from, it was interesting that the Department even collected any. In 1968 and 1977, Summit Lake (Alpine Co.) received fingerling LCT. The outlet of Summit Lake flows into Hobart Creek which is a tributary to Spicer. There is record of LCT x RT- Kamloops being planted in upstream Highland Lakes #1 in 1977. It is possible that these LCT were spillover from the 1977 plant. These LCT could have also been pumped in with the water that is diverted from the North Fork Stanislaus River to Spicer by the NCPA, but may have been transplanted illegally or accidently mixed in with a Department RT plant.

There was only one BK collected during the survey. Brook trout were last planted in 1986 but there appears to be successful recruitment happening in Spicer (CDFW Fish Files 2013). The large number of SD collected in relation to other species collected as well as the size of SD collected suggests a fishery conducive to the success of SD. Speckled dace are could be a significant portion of the RT, BK, and LCT diet, but also may compete for the same food resources when juveniles. Future spring surveys at Spicer will be conducted at the same time of the season to maximize consistency. The age and lengths of these RT will also be compared to RT from Angels Creek (Calaveras County, CA), just as it enters New Melones Reservoir, when that survey is finished.

Since 2003, the Department has stocked Spicer with 50,000 fingerling RT. From the number of RT collected during this survey and speaking with anglers that have fished Spicer for many years and keep coming back, the fingerling stocking program appears to be working well. The diversity of species seen and quality sizes/condition of the fish attained also suggests that Spicer is an overall productive fishery. The Department is looking at installing Angler Survey Boxes as well as conducting creel surveys to find out more information on the sizes and numbers of trout caught as well as angler satisfaction at Spicer.

References

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