

NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-49
2013

MARLETTE LAKE
WESTERN REGION



**NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUAL PROGRESS REPORT**

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**NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUAL PROGRESS REPORT**

State: *Nevada*
Project Title: *Statewide Fisheries Program*
Job Title: *Marlette Lake*
Period Covered: *January 1, 2013 through December 31, 2013*

SUMMARY

General Management Objective

A total of 13 volunteer angler surveys from the drop-box were received for Marlette Lake in 2013. During the months when surveys were received, 15 anglers fished for 59 hrs and caught 91 fish consisting of 64 rainbow trout, 4 brook trout, 14 LCT, and 9 tui chub. Resulting catch rates (all fish) were 6.07 fish per angler and 1.54 fish per hour.

The Mail-in Angler Questionnaire Survey estimated use at 317 anglers that fished for 841 angler days in 2012 that had caught a total of 5,578 fish resulting in a success rate of 6.63 fish per angler day.

Marlette Lake was stocked on six occasions in 2013. From June through August, the lake received 9,035 catchable Tahoe strain rainbow trout, 2,648 catchable Pilot Peak strain LCT, and 2,857 catchable Pyramid strain LCT.

Beginning in late-May and concluding at the end of June, NDOW and federal biologists, NDOW hatchery personnel, and volunteers manned the fish spawning station. Spawning activities and egg takes occurred on five days resulting in takes of 494,368 rainbow trout eggs, 11,136 bowcutt trout eggs, and 36,128 cuttbow trout eggs. Egg totals fell well below goals established for the spawn as a result of an extremely low number of fish captured in both the stream spawning trap and the lake-set hoop nets.

Marlette Lake Pilot Peak Strain Lahontan Cutthroat Trout Study Specific Objective

A total of 44 LCT consisting of 20 males and 24 females was captured during spawning operations at Marlette Lake in 2013. Of these, 75% (33 fish) were not previously Floy or PIT tagged. All untagged LCT were measured, weighed, sexed, and surgically implanted with a PIT tag for future study. The average length of untagged fish was 16.8 in (427.7 mm) and ranged from 13.4 in (340 mm) to 22.1 in (561 mm). The weight ranged from 0.7 lbs (326 g) to 5.8 lbs (2,642 g) and averaged 1.6 lbs (740.0 g).

Of the 44 LCT captured during spawning operations at Marlette Lake in 2013, 25% (11 fish) had been previously PIT tagged. No Floy tagged fish were captured. Of the PIT tagged LCT recaptured, prior genetic analysis revealed 7 to be Pilot Peak strain, 3 Pyramid strain, and one of Independence strain.

The LCT population used for production at Marlette Lake seems to be at a crossroads. The youngest age class of Pyramid/Independence-strain LCT stocked in 2007 will be eight years old in 2014 and returns seem to be diminishing in recent years. At the same time, none the four separate age classes of Pilot Peak-strain LCT in the reservoir has shown any sign of sufficient egg production thus far. There is a concern that older Pyramid/Independence-strain LCT will soon be lost through attrition, leaving the program in a quandary regarding production and use of LCT and bowcutt trout for sport fish management.

Marlette Lake Rainbow Trout Study Specific Objective

A total of 137 Floy-tagged Incline strain rainbow trout consisting of 52 males and 85 females were captured during spawning operations at Marlette Lake in 2013. Tagged rainbow trout represented two lots of fish that were hand-spawned in Third and Incline creeks, hatched and reared at Mason Valley Hatchery, and stocked in Marlette Lake to augment the reservoir's broodstock population. Of those captured, 116 were found to have blue Floy tags and represented fish stocked in 2010, while the remaining 21 had yellow Floy tags and were stocked in 2009.

Although the run of spawning fish caught in the fish trap within Trelease Creek was far less than desired for 2013, various lots of rainbow trout stocked in recent years, coupled with the 9,035 rainbow trout stocked this year, should provide an adequate number of spawning adults to meet production needs in the future.

As expected, rainbow trout stocked in 2009 were, on average, longer and heavier than those stocked in 2010. Although growth slowed considerably in the second year after stocking, the performance of Incline-strain rainbow trout still seemed to outpace that of other strains stocked at Marlette Lake in the past.

BACKGROUND

Sitting at an elevation of 7,825 ft in the Carson Range, Marlette Lake is a 381 surface acre oligotrophic reservoir that has a maximum depth of approximately 44 ft. The land surrounding Marlette Lake is predominantly a high elevation conifer/aspens habitat type that transitions into subalpine habitat types near the top of many adjunct peaks. The reservoir is located on the east side of the Lake Tahoe Basin and is situated entirely within the Lake Tahoe State Park.

Marlette Lake was constructed in 1873, when a small earth-fill dam was erected at the outlet to a broad glaciated basin. Lake water was piped to Virginia City via a series of flumes and pipes (inverted siphon).

During the early 1880's, Marlette Lake was solely a brook trout fishery. From 1883 until 1930, the Nevada Fish Commission conducted an annual fall spawn-take. In 1963, the reservoir was purchased by the State of Nevada and the Nevada Department of Fish and Game assumed management responsibility for the fishery. Following a need for broodstock to support Lahontan cutthroat trout stocking in Pyramid and Walker

lakes, LCT were introduced into the lake in 1964. Demand for large numbers of LCT eggs diminished in 1975 with the expiration of the Pyramid Lake Agreement.

Starting in 1984, rainbow trout hatched from eggs taken from adult spawning-sized fish from Lake Tahoe, were stocked into Marlette Lake to establish another much needed wild brood stock. To date, over 9 million rainbow trout eggs have been harvested from brood stock in Marlette Lake. When possible, the broodstock at Marlette Lake is enhanced with progeny from wild rainbow trout stocks collected from Lake Tahoe. The performance of these fish will be assessed through the Marlette Lake Rainbow Trout Study, which was initiated in 2009.

When broodstock operations at Big Springs Reservoir failed due to insufficient water supplies, Lahontan cutthroat trout were restocked into Marlette Lake for bowcutt/cuttbow trout production. Pyramid Lake strain and Independence Lake strain LCT were stocked between 2002 and 2007. In 2008, the Pilot Peak strain of LCT became available for sport fisheries management for use to create bowcutt trout eggs. The introduction of Pilot Peak LCT will be assessed through the Marlette Lake Pilot Peak LCT Study, which was initiated in 2009. The fishery at Marlette Lake is currently comprised of rainbow trout, brook trout, Lahontan cutthroat trout, Tahoe suckers, speckled dace, and tui chub.

In 2006, Marlette Lake was opened as a public fishery. The lake is managed under the Quality Coldwater Fishery Management Concept, which establishes angler success rates of 0.30 to 1.25 fish per hour and 2.0 to 3.5 fish per angler day. Fishing regulations allow angling from July 15 to September 30, one hour before sunrise until two hours after sunset. There is a zero-limit on fish and tackle is restricted to artificial lures with single barbless hooks.

OBJECTIVES AND APPROACHES

General Management Objectives:

- Conduct a general assessment of angler use and success through opportunistic angler contacts, return of angler drop-box surveys, and mail-in angler questionnaire data.
- Assist with the trout spawning operation during the spring to ensure fulfillment of eggs for NDOW's hatchery program.
- Coordinate with the USFWS to develop an "LCT Management Plan" that includes procedure and methods to PIT tag, stock, monitor, and spawn LCT in Marlette Lake.
- Evaluate the need to develop a cooperative agreement with current water users to maintain water levels that are conducive to the reservoir's fishery.

Study Specific Objectives - Marlette Lake Pilot Peak Strain Lahontan Cutthroat Trout:

- PIT tag all LCT captured in the spring spawning operation. Measure to fork length, weigh, determine sex, and take a tissue sample for genetic analysis.
- Record tag number, length, weight, and fin clips of any recaptured PIT or Floy-tagged LCT.
- Monitor the performance of tagged LCT by utilizing data collected during NDOW spawning operations.

Study Specific Objectives - Marlette Lake Rainbow Trout:

- Monitor the performance of tagged rainbow trout by utilizing data collected during NDOW spawning operations.

PROCEDURES

General Management Objectives

Conduct a general assessment of angler use and success through opportunistic angler contacts, return of angler drop-box surveys, and mail-in angler questionnaire data. Opportunistic visits were made to Marlette Lake throughout the summer/early-fall for collecting creel survey data. Surveys were completed when the greatest number of anglers was expected to be fishing. Information on angler harvest, effort, and origin were recorded on standard forms. Harvested fish were measured to fork length in millimeters.

During the course of other duties throughout the year, a volunteer angler survey box at Marlette Lake was maintained and restocked. At the end of the calendar year, data was summarized.

Angler use and success at Marlette Lake was also assessed through the Department's Mail-in Angler Questionnaire Survey. Angler questionnaire data is derived from a survey that is mailed to about 10 percent of license purchasers from the previous year.

Assist with the trout spawning operation during the spring to ensure fulfillment of eggs for NDOW's hatchery program. Beginning in late-May and concluding at the end of June, NDOW and federal biologists, NDOW hatchery personnel, and volunteers staffed the fish spawning station at Marlette Lake. During this time, pre-spawning rainbow trout and LCT were captured in a fish trap set up on Trelease Creek, a main tributary to the reservoir. Twice daily, fish were counted and sorted by species, sex, and ripeness and placed into separate holding pens within the creek until spawned. Trapped fish were augmented with fish captured in frame nets set throughout the lake.

Spawning activities and egg takes occurred on five occasions. On these days, fish were anesthetized, rinsed, hand spawned, and eggs were fertilized on station. Fork lengths of the first 50 fish of each species and gender were recorded. After cleaning and water hardening, eggs were transported to the Mason Valley Hatchery.

All rainbow trout and LCT captured in both the frame nets and the fish were examined for fin clips and/or tags. Tagged fish were subsequently measured and weighed on an electronic scale. Fin clips, tag types (Floy vs PIT) and/or tag numbers were recorded.

Coordinate with the USFWS to develop an “LCT Management Plan” that includes procedure and methods to PIT tag, stock, monitor, and spawn LCT in Marlette Lake. Assistance and coordination in matters related to LCT spawning and stocking at Marlette Lake was accomplished with the USFWS prior to, throughout, and subsequent to the spawning season. However, the LCT Management Plan was not completed. Time allotted for this project was instead spent researching and surveying for New Zealand mud snails in the Truckee River as well as assisting other Western Region biologists in various projects.

Evaluate the need to develop a cooperative agreement with current water users to maintain water levels that are conducive to the reservoir’s fishery. Assistance and coordination in matters related to water management at Marlette Lake was maintained throughout the year with operators of the Marlette/Hobart Water System that is administered by the Nevada Division of Buildings and Grounds. Unfortunately, no progress was made on a cooperative agreement due to both agencies having extremely heavy workloads. Time allotted for this project was instead spent researching and surveying for New Zealand mud snails in the Truckee River as well as assisting other Western Region biologists in various projects.

Marlette Lake Pilot Peak Strain Lahontan Cutthroat Trout Study Specific Objective

PIT tag all LCT captured in the spring spawning operation. Measure to fork length, weigh, determine sex, and take a tissue sample for genetic analysis. In cooperation with the U.S. Fish and Wildlife Service (USFWS), all untagged LCT captured in the stream fish trap and lake-set frame nets were classified by gender and scanned electronically for a PIT tag. Fish without an existing tag were anesthetized, measured, weighed, and had a PIT tag surgically implanted. A fin clip was also taken from all untagged LCT for genetic analysis.

In an effort to maximize genetic diversity during spawning, the USFWS maintains a comprehensive database detailing the strain, life history, and family origin of all LCT PIT tagged at Marlette Lake. Beginning in 2011, all LCT either stocked or captured during spawning operations were implanted with a PIT tag.

Record tag number, length, weight, and fin clips of any recaptured PIT or Floy-tagged LCT. Tag number, tag color, sex, fork length, weight, and presence of prior fin clips were recorded on all recaptured LCT during spawning operations at Marlette Lake this year.

Monitor the performance of tagged LCT by utilizing data collected during NDOW spawning operations. Length and weight were recorded on all previously tagged LCT captured during spawning operations at Marlette Lake in 2012. An attempt was made to compare this data to previous data in an effort to determine growth rate, longevity, and performance of LCT in Marlette Lake.

Marlette Lake Rainbow Trout Study Specific Objective

Monitor the performance of tagged rainbow trout by utilizing data collected during NDOW spawning operations. Data gathered (length, weight, and body condition) from all previously tagged rainbow trout recaptured during spawning operations this year was compared to previous data in an effort to determine growth rate, longevity, and performance of rainbow trout in Marlette Lake.

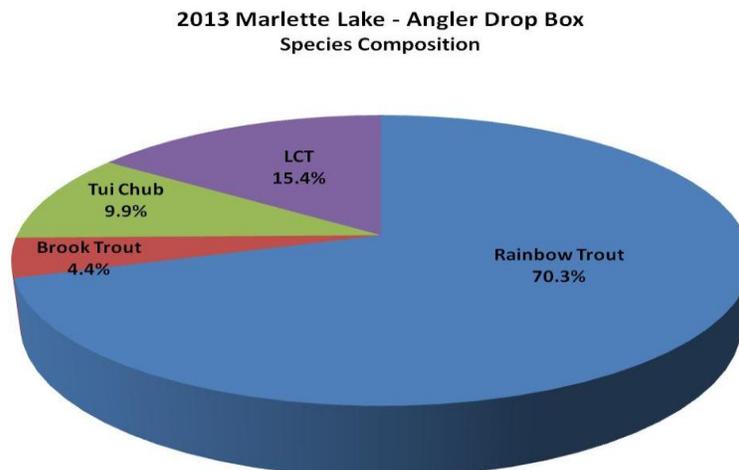
FINDINGS

General Management Objective

Conduct a general assessment of angler use, success, and harvest through opportunistic angler contacts, return of angler drop-box surveys, and mail-in angler questionnaire data. One trip was made to Marlette Lake during the 2013 fishing season, however, no opportunistic angler contacts were made.

A total of 13 volunteer angler surveys from the drop-box were received from Marlette Lake in 2013. During the months when surveys were received, 15 anglers fished for 59 hrs and caught 91 fish consisting of 64 rainbow trout, 4 brook trout, 14 LCT, and 9 tui chub. Resulting catch rates (all fish) were 6.07 fish per angler and 1.54 fish per hour. Because the regulation prohibits harvest at Marlette Lake, all fish were reported as released. Resulting species composition for 2013 was 70.3% rainbow trout, 4.4% brook trout, 15.4% LCT, and 9.9% tui chub (Figure 1).

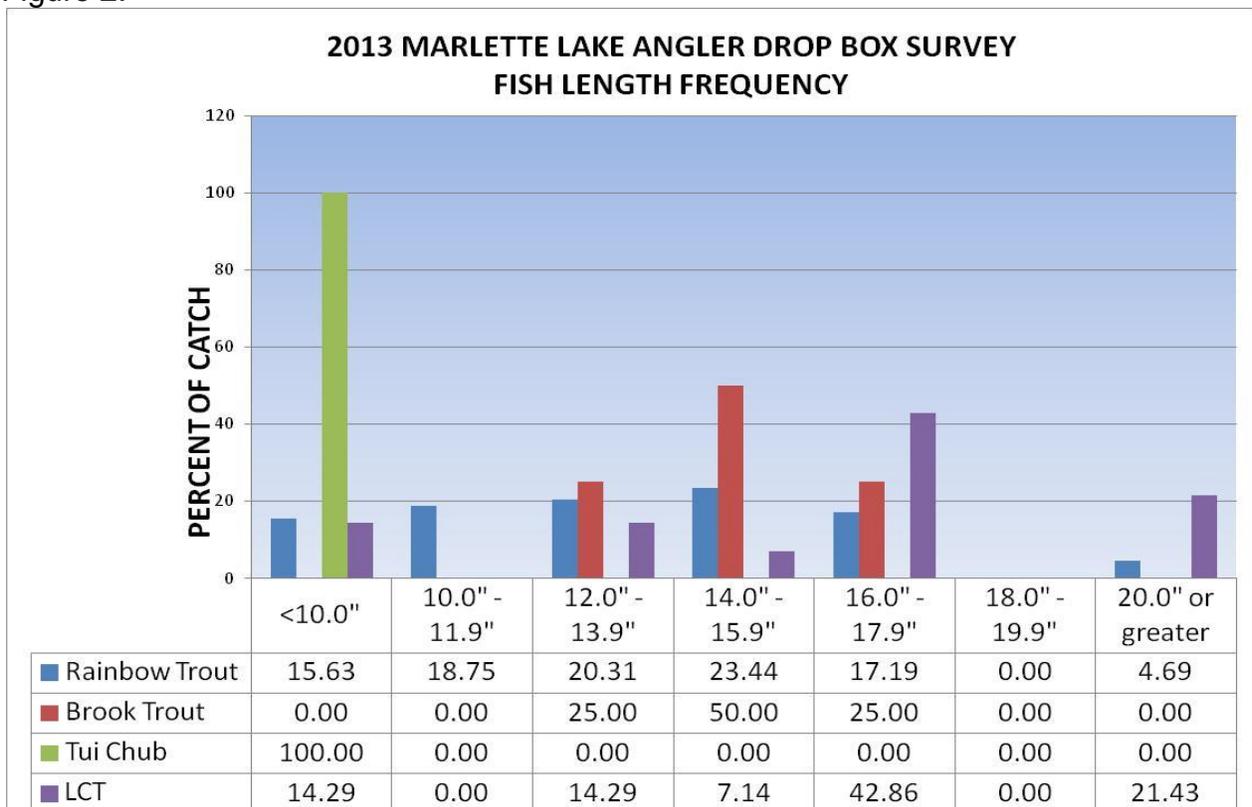
Figure 1.



In examining the length frequency reported through the drop-box survey, all tui chub were predictably less than 10 in (Figure 2). Both rainbow trout and LCT show a somewhat equal representation among most size classes while brook trout exhibit a more traditional bell-shaped catch curve. This is entirely expected in a fishery such as Marlette Lake where rainbow trout and LCT are stocked and brook trout represent a wild, self-sustaining population (Figure 2). Somewhat puzzling is the fact that 15.6 percent of rainbow trout and 14.3 percent of LCT were reported to be less than 10.0 inches. This seems improbable because neither had been stocked at Marlette Lake since 2011 at average sizes of 9.2 in (234 mm) and 9.0 in (229 mm), respectively. It is more likely that sizes of fish caught were simply misjudged.

Shore anglers (53.3%) and those fishing from float tubes (46.7%) were split rather evenly while a vast majority of anglers (86.7%) reported to have been fly-fishing rather than using lures while fishing. Angler satisfaction in 2013 was rated on a scale of -2 to +2, with -2 being unsatisfied and +2 representing satisfaction. Average ratings were overwhelmingly positive at 1.58 for total fishing experience and 1.43 for both size of fish and number of fish. Angler success corresponded well with angler satisfaction (Figure 3). That is, the more anglers catch, the happier they are.

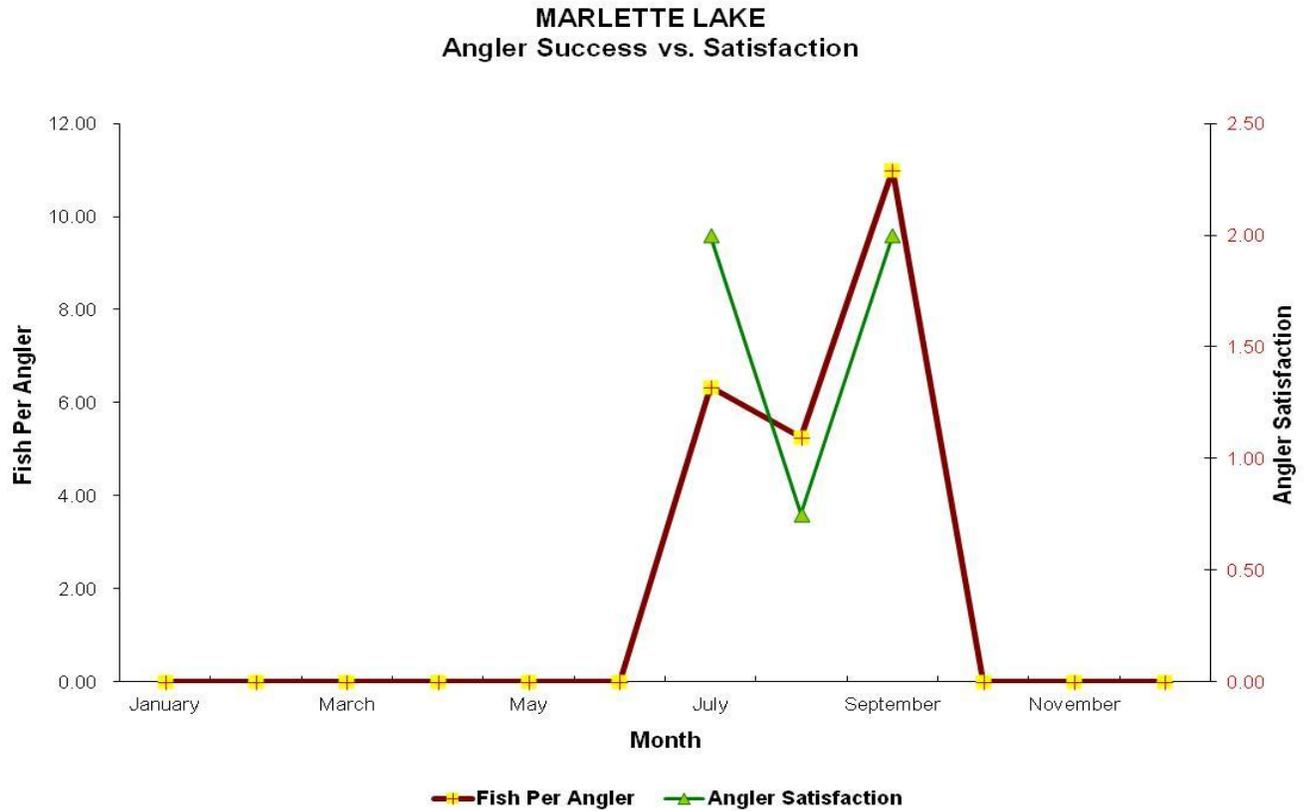
Figure 2.



The Mail-in Angler Questionnaire Survey estimated use at 317 anglers that fished for 841 angler days in 2012. Both of these figures are higher than the estimated 247 anglers and 433 angler use days from the 2011 survey. On the contrary, the 5,578

total fish caught and 6.63 fish per angler day found in 2012 were substantially lower than the 7,041 fish and 16.26 fish per day found the previous year.

Figure 3.



Stocking Program

Marlette Lake was stocked on six occasions in 2013 (Table 1). From June through August, the lake received 9,035 catchable Tahoe strain rainbow trout, 2,648 catchable Pilot Peak strain LCT, and 2,857 catchable Pyramid strain LCT.

Table 1. Marlette Lake Stocking Summary – 2013.

Date	Species	Number	Size (in.)	Strain
6/28/13	Rainbow	3,000	9.5	Tahoe
8/7/13	Rainbow	3,885	9.9	Tahoe
8/12/13	Rainbow	2,150	9.9	Tahoe
Rainbow Total		9,035	9.5 – 9.9	
6/28/13	LCT	2,857	8.5	Pyramid
7/16/13	LCT	730	12.5	Pilot Peak
7/17/13	LCT	1,918	9.1	Pilot Peak
LCT Total		5,505	8.5 – 12.5	
Total (All Fish)		14,540		

Table 2. Marlette Lake Stocking History 2008 – 2012.

Year	Species	Number	Size Range (in.)	Clips	Comment
2008	Rainbow (Tahoe)	4,002	9.4		
2008 Total		4,002			
2009	Rainbow (Incline)	2,986	9.5		Yellow Floy tagged
	LCT (Pilot Peak)	2,984	9.0		1st stocking of Pilots in Marlette Lake – Gray Floy Tagged
2009 Total		5,970			
2010	Rainbow (Incline)	3,065	9.2		Blue Floy tagged
	LCT (Pilot Peak)	2,993	9.2	Adipose	1,390 w/ Gray Floy tags
	LCT (Pilot Peak)	500	17.3	Adipose	LNFH broodstock – PIT tagged
2010 Total		6,558			
2011	Rainbow (Tahoe)	3,001	9.2		
	LCT (Pilot Peak)	1,001	9.0	Adipose	PIT tagged and clipped at MVH 7/25/11
2011 Total		4,002			
2012	N/A	0	-		
2012 Total		0			
Total		20,532			

Assist with the trout spawning operation during the spring to ensure fulfillment of eggs for NDOW’s hatchery program. Spawning activities occurred on five days in June of 2013 resulting in a total take of 541,632 eggs. During these occasions, 1,249 rainbow trout and 31 LCT were hand spawned at the Marlette Lake spawning station. There were 1,181 Tahoe-strain rainbow trout (636 female and 545 male) used to generate four lots of rainbow trout that resulted in 494,368 eggs taken. Average length of 415 rainbow trout measured (including those for bowcutt production) was 13.0 in (329.8 mm) and ranged from 10.4 in (265 mm) to 18.8 in (478 mm).

A total of 28 male rainbow trout and 15 female LCT were hand spawned to produce two lots of bowcutt trout, totaling 11,136 eggs harvested. Conversely, 40 female rainbow trout and 16 male LCT were used in the production of two lots of cuttbow trout that resulted in a take of 36128 eggs. Average length of 33 LCT measured for the production of both bowcutt trout and cuttbow trout was 16.8 in (425.8 mm) and ranged from 13.0 in (331 mm) to 22.4 in (570 mm).

Because the growth and performance of Pilot Peak-strain LCT in Marlette thus far has been dismal, it can be assumed that the larger-sized LCT captured represent Pyramid or Independence strain LCT that were stocked in 2007 or earlier. Although 500 Pilot Peak-strain broodstock averaging 17.3 in (439.4 mm) were stocked by USFWS in 2010, they were all PIT tagged. None of these fish has been observed during spawning operations at Marlette Lake in the past two years.

Coordinate with the USFWS to develop an “LCT Management Plan” that includes procedure and methods to PIT tag, stock, monitor, and spawn LCT in Marlette Lake. Assistance and coordination in matters related to LCT spawning and stocking at Marlette Lake occurred with the USFWS personnel prior to and throughout the spawning season. Meetings were held with FWS both prior and subsequent to the

spawning operation to agree upon LCT handling, tagging, and spawning procedures and assess successes. Unfortunately, the LCT Management Plan was not completed due to both agencies having extremely heavy workloads.

Evaluate the need to develop a cooperative agreement with current water users to maintain water levels that are conducive to the reservoir's fishery. Assistance and coordination in matters related to water management at Marlette Lake was maintained throughout the year with operators of the Marlette/Hobart Water System that is administered by the Nevada Division of Buildings and Grounds. Unfortunately, no progress was made on a cooperative agreement due to both agencies having extremely heavy workloads.

Marlette Lake Pilot Peak Strain Lahontan Cutthroat Trout Study Specific Objective

PIT tag all LCT captured in the spring spawning operation. Measure to fork length, weigh, determine sex, and take a tissue sample for genetic analysis. A total of 44 LCT consisting of 20 males and 24 females was captured during spawning operations at Marlette Lake in 2013. Of these, 75% (33 fish) were not previously Floy or PIT tagged. The average length of untagged fish was 16.8 in (427.7 mm) and ranged from 13.4 in (340 mm) to 22.1 in (561 mm). The weight ranged from 0.7 lbs (326 g) to 5.8 lbs (2,642 g) and averaged 1.6 lbs (740.0 g). All untagged LCT were anesthetized, measured, weighed, and had a PIT tag surgically implanted. A fin clip was also taken from all untagged LCT for genetic analysis.

There was a large disparity in sizes of untagged LCT captured. Larger-sized fish likely represent Pyramid or Independence-strain LCT that were stocked before 2008. Although 500 large-sized Pilot Peak-strain broodstock were stocked by USFWS in October of 2010, they were all PIT tagged. A total of six smaller untagged fish captured are likely Pilot Peak strain LCT. Prior to this spring's spawning period, Pilot Peak-strain LCT had been stocked at Marlette Lake on four occasions since 2009. Because all Pilot Peak-strain LCT stocked in 2011 were PIT tagged, the smaller untagged LCT captured this year likely represented fish stocked in 2009 or 2010. LCT stocked on these two occurrences were given a gray Floy tag, however, as was previously realized at Marlette Lake, tag retention has been very poor.

Record tag number, length, weight, and fin clips of any recaptured PIT or Floy-tagged LCT. Of the 44 LCT captured during spawning operations at Marlette Lake in 2013, 25% (11 fish) had been previously PIT tagged. No Floy tagged fish were captured. Of the PIT tagged LCT recaptured, prior genetic analysis revealed 7 to be Pilot Peak strain, 3 Pyramid strain, and one of Independence strain.

The seven Pilot Peak LCT recaptured averaged 13.6 in (344.1 mm) and ranged from 13.0 in (331 mm) to 14.2 in (361 mm). Weight of the seven Pilot Peak LCT ranged from 0.8 lbs (358 g) to 0.9 lbs and averaged 0.8 lbs (379.3 g). All Pilot Peak strain LCT recaptured were found to have an adipose fin clip.

The three recaptured Pyramid strain LCT had an average length of 17.7 in (448.7 mm) that ranged from 16.4 in (416 mm) to 18.5 in (470 mm). Weight of these LCT ranged from 1.2 lbs (563 g) to 1.7 lbs (758 g) and averaged 1.5 lbs (660.5 g). All Pyramid strain LCT recaptured had an adipose fin clip.

The single Independence strain LCT recaptured was 16.5 in (420 mm) in length, weighed 1.2 lbs (534 g), and contained an adipose fin clip.

Monitor the performance of tagged LCT by utilizing data collected during NDOW spawning operations. A comprehensive database maintained by the USFWS details the strain, life history, and family origin of every PIT tagged LCT in Marlette Lake. Prior genetic analysis reveals the 11 PIT tagged LCT captured during spawning operations at Marlette Lake in 2013 were comprised of 7 Pilot Peak strain, 3 Pyramid strain, and one of Independence strain fish

The seven Pilot Peak LCT recaptured averaged 13.6 in (344.1 mm) in length. All seven were found to contain an adipose fin clip and were found to represent fish stocked in 2010 at an average length of 9.2 in (233.7 mm). In just under three years, the Pilot Peak LCT recaptured show an average length increase of 4.4 in (110.4 mm), coming to nearly 1.5 in per year since stocked. Of six LCT mortalities experienced during spawning operations, three were confirmed to be Pilot Peak fish.

Although the growth and longevity of Pilot Peak LCT in Marlette Lake remains of concern, some positive indicators were observed this year. Mortality is still of concern, however, it was nowhere near the 73% mortality rate of Pilot Peak fish experienced last year. Moreover, the growth rate of Pilot Peak fish recaptured this year was nearly identical to that of a load of blue Floy-tagged rainbow trout stocked at the same time in 2010. Worrisome is the fact that, although numbers of Pilot Peak LCT and blue Floy-tagged rainbow trout stocked in 2010 were nearly identical, 116 Floy-tagged rainbow trout were recaptured this year as compared to just 13 (7 confirmed plus an additional 6 likely) Pilot Peak LCT.

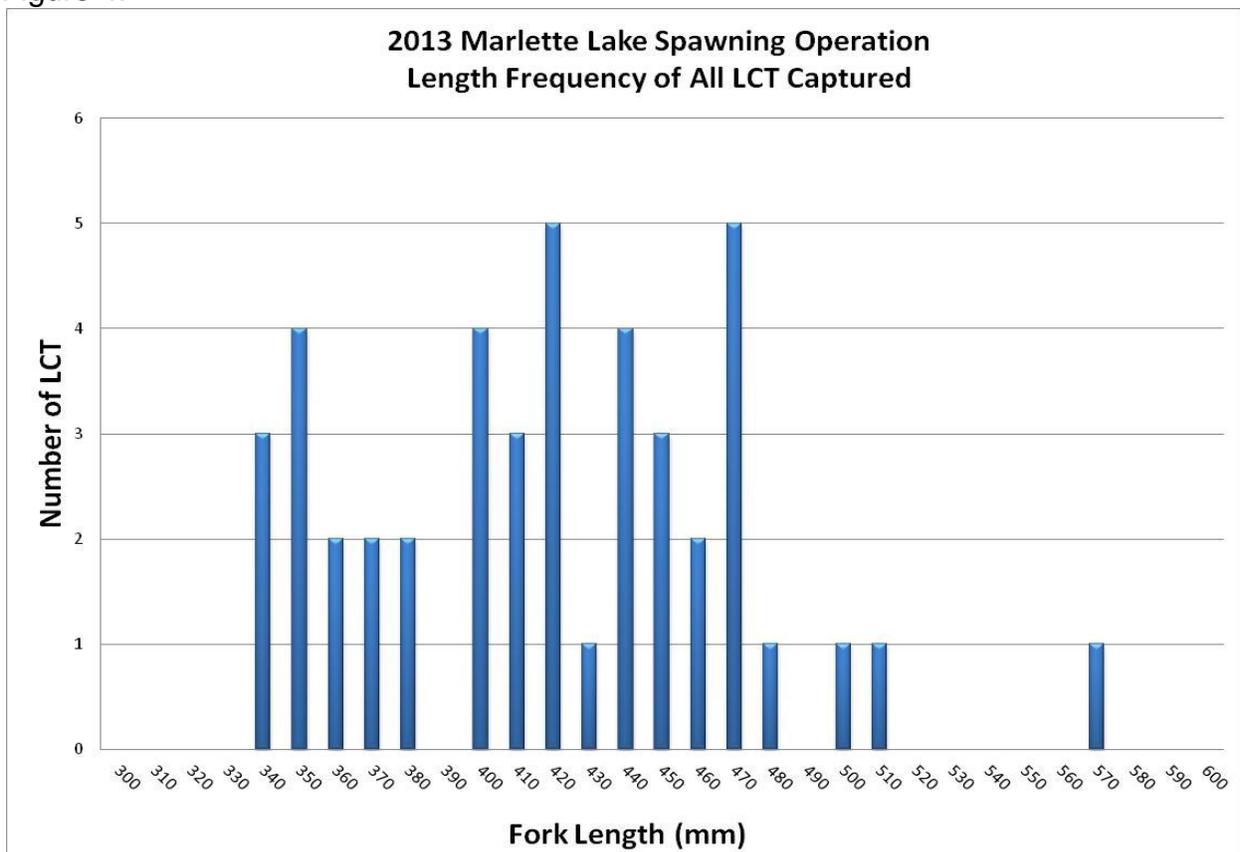
Three recaptured Pyramid strain LCT had an average length of 17.7 in (448.7 mm). These likely represent fish from the last time Pyramid strain LCT were stocked at Marlette Lake, a load of 3,055 fish stocked in June of 2007 at an average length of 9.9 in (251.5 mm). If this is the case, the Pyramid strain LCT recaptured this year show an average length increase of 7.8 in (197.2 mm) or 1.3 in (32.9 mm) per year. The Pyramid strain LCT recaptured this year show impressive longevity in Marlette Lake given the fact that they are, at a minimum, seven years old.

Of remarkable note is the single Independence strain LCT recaptured this year. At least 10 years old, this fish proves to be a true survivor as the last time Independence strain LCT were stocked at Marlette Lake was in 2004 at an average length of 8.0 in (203.2 mm). This fish showed a length increase of 8.5 in (216.8 mm) compared to when stocked. Initially, it would appear as if it had grown at a rate of 0.9 in (24.1 mm) per year. However, when this fish was first recaptured and implanted with a

PIT tag during the 2011 spawning season, it was the exact same length as this year. Given the fact that this fish had shown zero length increase in the past two years, a growth rate of 1.2 in (31.0 mm) per year could be calculated. Regardless of growth, the longevity of Independence strain LCT in Marlette Lake is noteworthy.

Although strain identity of untagged LCT captured this year remains unknown until genetic analysis is complete, it is noteworthy to compare known Pilot Peak-strain LCT with unknown-strain (untagged) LCT captured. A length frequency analysis of all LCT captured in 2013 proves quite revealing. Using a length breakpoint of 15 in (380 mm), Pilot Peak-strain LCT that were stocked from 2009 through 2011 are easily differentiated from Pyramid/Independence-strain LCT stocked in 2007 and prior (Figure 4). This is confirmed through length data which showed the largest known (PIT tagged) Pilot Peak LCT captured was just 14.2 in (361 mm). Length frequency analysis completed on LCT captured last year (2012) showed a length breakpoint of 13.8 in (350 mm) separating Pilot Peak LCT from other strains. The difference in breakpoints (1.2 in) corresponds nicely to the yearly average growth rate calculated.

Figure 4.



Excluding the broodstock LCT stocked in 2010, three distinguishable age classes of Pilot Peak-strain LCT should be evident in the length frequency histogram (Figure 4) given the fact that catchable-sized Pilot Peak LCT had been stocked at Marlette Lake on three separate occasions in three separate years prior to the 2013 spawning season.

There are no discernible break points between these age classes, illustrating that growth of Pilot Peak-strain LCT in Marlette Lake, at least during early life stages, is relatively poor.

Marlette Lake Rainbow Trout Study Specific Objective

Monitor the performance of tagged rainbow trout by utilizing data collected during NDOW spawning operations. A total of 137 Floy tagged Incline-strain rainbow trout consisting of 52 males and 85 females were captured during spawning operations at Marlette Lake in 2013. Tagged rainbow trout represented two lots of fish that were hand-spawned in Third and Incline creeks, hatched and reared at Mason Valley Hatchery, and stocked at Marlette Lake to augment the reservoir's broodstock population. Yellow Floy-tagged rainbow trout captured were the progeny of fish spawned in 2008 and stocked in 2009, while blue Floy-tagged rainbow trout represented fish spawned in 2009 and stocked at Marlette Lake in 2010.

A total of 116 of the tagged rainbow trout captured had blue Floy tags. Average length was 13.6 in (344.3 mm) and ranged from 11.5 in (291 mm) to 16.0 in (406 mm). Weight ranged from 0.5 lbs (228 g) to 1.6 lbs (724 g) and averaged 0.9 lbs (428.1 g). They showed an average increase in length of 4.4 in (110.6 mm) since the time they were stocked in July of 2010. This equates to an average growth rate of 1.5 in (38.9 mm) per year.

A total of 21 of the tagged rainbow trout captured had yellow Floy tags. Their average length was 14.0 in (355.4 mm) and ranged from 13.3 in (337 mm) to 14.9 in (379 mm). Weight ranged from 0.7 lbs (333 g) to 1.2 lbs (545 g) and averaged 1.0 lb (452.4 g) overall. Yellow Floy-tagged rainbow trout showed an average increase in length of 4.5 in (114.1 mm) since the time they were stocked in July of 2009. This equates to an average growth rate of 1.1 in (28.5 mm) per year.

Although the run of spawning fish caught in the fish trap within Trelease Creek was far less than desired for 2013, various lots of rainbow trout stocked in recent years, coupled with the 9,035 rainbow trout stocked this year, should provide an adequate number of spawning adults to meet production needs in the future.

MANAGEMENT REVIEW

General Management Objective

Angler success rates of 1.54 fish per hour documented in the Angler Drop-box Survey and 6.63 fish per angler day from the Mail-in Angler Questionnaire Survey both exceed the guidelines of 0.30 to 1.25 fish per hour and 2.0 to 3.5 fish per angler day prescribed for a Coldwater General Fishery Management Concept. Although angler use at Marlette Lake has declined since the lake opened to angling in 2006, fishing remains good for anglers willing to make the 4.5 mi hike. Because the reservoir offers habitat that is not subject to dramatic fluctuations, salmonid populations remain stable from year to year.

Egg take results of 494,368 rainbow trout, 11,136 bowcutt trout, and 36,128 cuttbow trout fell far short of pre-spawn goals. Especially troubling is the fact that no LCT eggs were produced. The dismal egg take is a direct result of a very poor run of fish into the spawning trap at Marlette Lake for the second consecutive year. Even with conducive weather conditions, numbers of fish entering the trap began fairly decent but diminished rather rapidly. Over the course of many years, the area of Marlette Lake directly in front of the Trelease inflow has experienced heavy sedimentation, possibly hindering the annual spawning run. Prior to next year's spawning activities, both the fish trap and the area at the Trelease Creek confluence should be dredged to improve spawning conditions for resident trout.

The LCT population used for production at Marlette Lake seems to be at a crossroads. The youngest age class of Pyramid/Independence strain LCT stocked in 2007 will be eight years old in 2014 and numbers seem to be diminishing in recent years. At the same time, none the four separate age classes of Pilot Peak strain LCT in the reservoir has shown any sign of sufficient egg production thus far. There is a concern that older Pyramid/Independence strain LCT will soon be lost through attrition, leaving the program in a quandary regarding production and use of LCT and bowcutt trout for sport fish management.

Marlette Lake Pilot Peak Strain Lahontan Cutthroat Trout Study Specific Objective

The Lake Tahoe Basin snowpack level was well below average during the winter of 2012-13 for the second consecutive year. As a result, access to Marlette Lake was achieved in early May. Although access, weather, and water conditions were beneficial, the spawn run up Trelease Creek in 2013 was one of the worst on record.

The Marlette Lake Pilot Peak LCT study appeared successful. Data were gathered and analyzed in an effort to learn more about the growth, survival, and spawning habits of Pilot Peak strain LCT in Marlette Lake. In 2011, the study was adjusted to facilitate future use of Marlette Lake as a potential source for Pilot Peak strain LCT. Beginning in 2011 and continuing this year, all untagged LCT captured in both the fish trap and hoop nets during spawning activities were classified by sex, measured, weighed, and had a PIT tag surgically implanted. A fin clip was also taken from all untagged LCT for future genetic analysis to aid in strain identification. In addition, length, weight, sex, and tag identification data were gathered from those LCT with existing Floy tags or PIT tags in an effort to determine longevity, growth rate, and post-spawn survival. A total of 33 previously untagged LCT were implanted with a PIT tag in 2013.

The performance of Pilot Peak-strain LCT in Marlette Lake thus far is troubling. The three lots of catchable Pilot Peak LCT stocked in three consecutive years (2009 – 2011) have shown poor growth rates, to the point that the lots were indistinguishable from one another. In addition, none of the Pilot Peak strain broodstock stocked in 2010 appeared in the fish trap or hoop nets during spawning activities this year. Although growth rates of Pilot Peak LCT matched those of a lot of rainbow trout stocked simultaneously in 2010, the return of Pilot Peak LCT this year was just 11% of the return

of rainbow trout. The combination of these factors suggests that future sport fish production of LCT and bowcutt trout could be jeopardized.

Marlette Lake Rainbow Trout Study Specific Objective

A sufficient number of Floy-tagged rainbow trout were captured during spawning activities to adequately assess growth of the species at Marlette Lake. As expected, rainbow trout stocked in 2009 were, on average, longer and heavier than were those stocked in 2010. Although growth slowed considerably in the second year after stocking, the performance of Incline-strain rainbow trout still seems to outpace that of other strains stocked at Marlette Lake in the past. The rainbow trout study should continue in an effort not only to augment the population of Incline strain rainbow trout, but also to diversify their gene pool.

RECOMMENDATIONS

General Management Objectives:

- Conduct a general assessment of angler use, success, and harvest through opportunistic angler contacts, return of angler drop-box surveys and mail-in angler questionnaire data.
- Assist with the trout spawning operation during the spring to ensure fulfillment of eggs for NDOW's hatchery program.
- Coordinate with the USFWS to develop an "LCT Management Plan" that includes procedure and methods to PIT tag, stock, monitor, and spawn LCT in Marlette Lake.
- Evaluate the need to develop a cooperative agreement with current water users to maintain water levels that are conducive to the reservoir's fishery.

Study Specific Objectives - Marlette Lake Pilot Peak Strain Lahontan Cutthroat Trout:

- PIT tag all LCT captured during the spring spawning operation. Measure to fork length, weigh, determine sex, and take a tissue sample for genetic analysis.
- Record tag number, length, weight, and fin-clips of any recaptured PIT or Floy-tagged LCT.
- Monitor the performance of tagged LCT by utilizing data collected during NDOW spawning operations.

Study Specific Objective - Marlette Lake Rainbow Trout:

- Monitor the performance of tagged rainbow trout by utilizing data collected during NDOW spawning operations.

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