

NEVADA DEPARTMENT OF WILDLIFE  
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-53  
2017

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, 2017 through December 31, 2017*

**SUMMARY**

A total of 22 surveys were received from the Marlette Lake drop-box. Anglers reported fishing for 73 hrs and catching 90 fish consisting of 64 rainbow trout, 10 brook trout, 3 LCT, and 13 tui chub. Catch rates (all species included) were 4.8 fish per angler and 1.2 fish per hour. Because regulations prohibit harvest at Marlette Lake, all fish were reported as released.

The 2016 Mail-in Angler Questionnaire Survey estimated 310 anglers fished for 369 days. The estimated number of anglers was higher than the 10 year average for the fishery, while estimated use was lower. The estimated fish/angler (7.9), days/angler (1.2), and fish/day (6.7) were all lower than the nine-year averages (18.4, 2.3, and 7.6, respectively).

Marlette Lake was stocked four times in 2017. From July through October, the lake received 11,420 fish consisting of 2,629 Pilot Peak strain LCT, 2,797 Pyramid Lake (contemporary) strain LCT, and 5,994 rainbow trout (Incline and Tahoe strains).

One day in July was spent conducting spawning activities and 203 rainbow trout and 66 Pyramid strain LCT were hand spawned resulting in a take of 105,254 eggs.

**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 dominated by high elevation conifer/aspens habitat that transitions into subalpine habitat 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 Lake Tahoe State Park.

Marlette Lake was constructed in 1873, when a small earthen-filled 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) made famous by Hermann Schussler.

During the early 1880's, Marlette Lake was solely a brook trout fishery. From 1883 until 1930, the Nevada Fish Commission artificially spawned brook trout for propagation and stocking. 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 (LCT,

*Oncorhynchus clarkii henshawi*) stocking in Pyramid and Walker lakes, LCT were introduced in 1964. Demand for large numbers of LCT eggs diminished in 1975 with the termination of the Pyramid Lake Agreement.

Starting in 1984, rainbow trout (*Oncorhynchus mykiss*), brood of artificially spawned fish from Lake Tahoe, were stocked into Marlette Lake to establish another much needed wild brood stock. To date, over nine million rainbow trout eggs have been harvested from brood stock in Marlette Lake. When possible, the broodstock is enhanced with progeny of wild rainbow trout stocks collected from Lake Tahoe. The performance of the current brood stock will be assessed through the Marlette Lake Rainbow Trout Study initiated in 2009.

Since broodstock operations at Big Springs Reservoir (Humboldt County) failed due to insufficient water supplies, LCT was restocked into Marlette Lake for production of hybrids (i.e., bowcutts and cuttbows). Pyramid Lake strain LCT and Independence Lake strain LCT were stocked between 2002 and 2007. In 2008, Pilot Peak LCT became available to produce bowcutt trout eggs for sport fish management. The success of Pilot Peak strain 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 sport fishery. The lake is managed under the Quality Coldwater Fisheries Management Concept, which establishes angler success rates at 0.30-1.25 fish per hour and 2.0-3.5 fish per angler day. Fishing is allowed 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.

During the winter of 2016/17, Lake Tahoe basin had a recorded snow water equivalent of 217% of average according to the USDA Nevada Water Supply Outlook Report on April 1, 2017. This historic amount of precipitation resulted in full reservoirs and flood-like conditions in tributaries during late winter and early spring. While this was much needed, it also posed several problems across the region. Due to the snowpack at Marlette Lake, the Marlette/Hobart Water Authority became concerned that the dam would overtop during 2017 spring runoff and would pose a threat to downstream structures and potentially human life. The decision was made to lower the lake nearly eight feet in April. This draw down resulted in the lake being below capacity in June and July, and undoubtedly affected the timing and success of the annual spawn-take. The above average snowpack also made it extremely difficult to access the reservoir in late spring. It was believed that when the spawning channel was set up, the majority of fish already attempted to spawn. Since there was no access to the tributary, fish were unsuccessful.

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

## PROCEDURES

**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.** While a number of anglers were observed fishing from float tubes, no anglers were contacted during the 2017 season.

During the course of other duties, a volunteer angler survey box at Marlette Lake was maintained and restocked. At the end of the fishing season, data was collected and summarized. Angler satisfaction in 2017 was rated on a scale of -2 to +2, with -2 being unsatisfied and +2 representing satisfaction.

Angler use and success in 2016 was also assessed through the Department's Mail-in Angler Questionnaire Survey. Angler questionnaire data was derived from a survey mailed to 30,000 license purchasers in 2016.

**Assist with the trout spawning operation during the spring to ensure fulfillment of eggs for NDOW's hatchery program.** Beginning in late-June and concluding in mid-July, NDOW, U.S. Fish and Wildlife Service (USFWS), and volunteers staffed the fish spawning station at Marlette Lake. During this time, pre-spawn rainbow trout and LCT were captured in the fish trap at the mouth of 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 artificially spawned. Fish caught in the creek were augmented with fish captured in frame nets set throughout the lake.

On-site artificial spawning activities occurred on one occasion. During the egg take, fish were anesthetized, rinsed, hand spawned, and fertilized by mixing eggs and sperm. After cleaning and water hardening, eggs were transported to Mason Valley Hatchery for rearing.

Additionally, fork length and weight of the first 35 fish of each species and gender were measured from each lot of fish spawned. All rainbow trout and LCT captured were examined for previous markings - 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.

**Monitor the performance of tagged LCT by utilizing data collected during NDOW spawning operations.** In cooperation with USFWS, untagged but adipose clipped LCT caught were classified by gender and scanned electronically for a PIT tag. Fish without an existing tag were anesthetized, measured, weighed, sexed, and surgically implanted with a PIT tag. A fin clip was also taken from untagged LCT for later genetic analysis.

In order 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 adipose clipped Pilot Peak LCT captured during spawning operations are implanted with a PIT tag.

Tagged fish captured were used to determine growth rate, longevity, and performance of each strain in Marlette Lake.

**Monitor the performance of tagged rainbow trout by utilizing data collected during NDOW spawning operations.** Data (length, weight, and body condition) gathered this year from tagged rainbow trout was used to examine growth rate, longevity, and performance of multiple strains of rainbow trout in Marlette Lake.

## FINDINGS

**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.** A total of 22 surveys were received from the Marlette Lake drop-box. Anglers reported fishing 73 hrs to catch 90 fish consisting of 64 rainbow trout, 10 brook trout, 3 LCT, and 13 tui chub (Figure 1). Catch rates (all species included) were 4.8 fish per angler and 1.2 fish per hour. All fish were reported as released since regulations prohibit harvest at Marlette Lake.

An examination of length found all tui chub were less than 12.0 inches (Figure 2) while each trout species was evenly distributed throughout most size classes. All reported cutthroat trout were greater than 16.0 inches (n=3), while rainbow trout ranged from less than 10.0 inches and up to 19.9 inches (n=64).

Shore anglers outnumbered those fishing from boats or float tubes in a ratio similar to the six-year average, which is to be expected at a hike-in fishery such as Marlette Lake. Angler satisfaction ratings were positive, averaging 1.3 for total fishing experience, 1.1 for size of fish, and 1.0 for number of fish. However, ratings are slightly lower than 6-year averages. The difficult access combined with a large fluctuation in lake level during spring and summer seem to have had a negative impact on fishing productivity, resulting in lower satisfaction in 2017.

Figure 1.

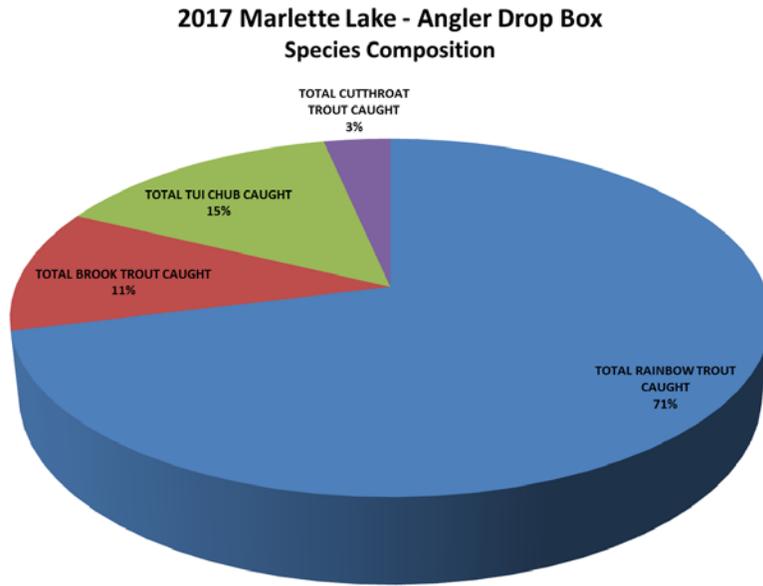
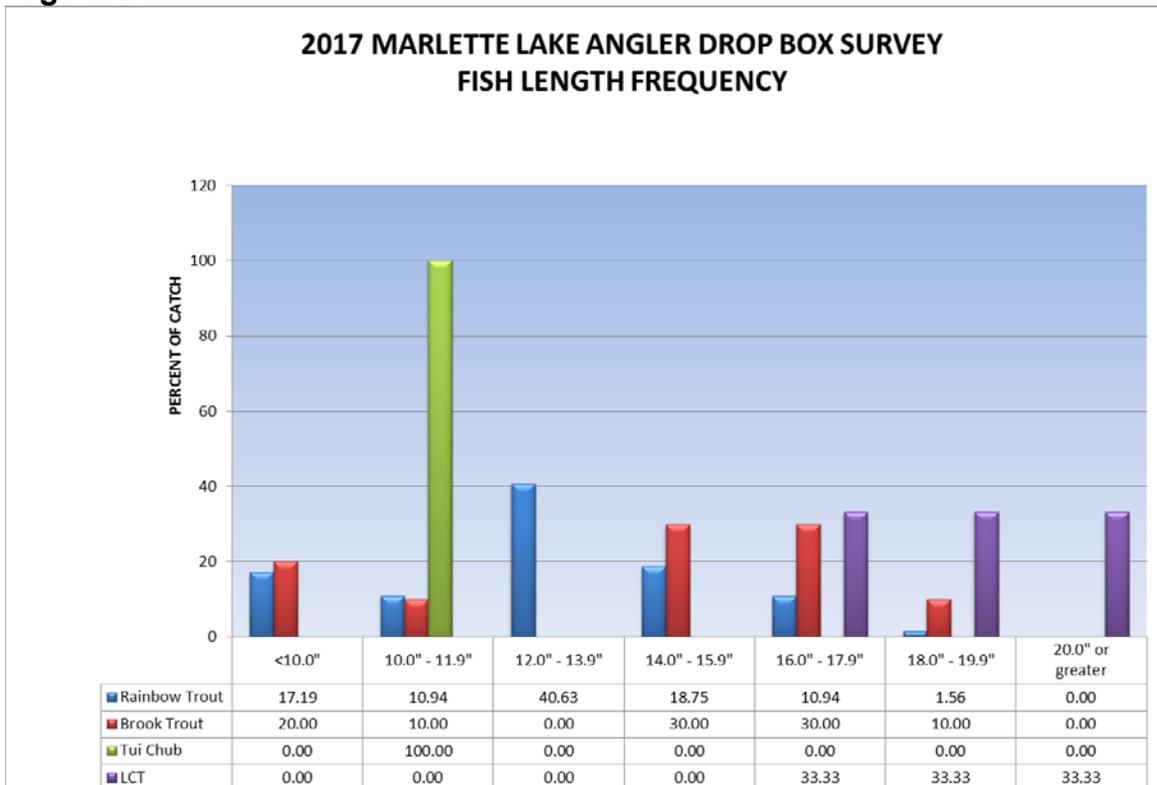


Figure 2.



In 2016, the Mail-in Angler Questionnaire Survey estimated 310 anglers fished 369 days. The estimated number of anglers was higher than the 10-year average, while the estimated use was lower. The estimated fish per angler (7.9), days/angler (1.2), and fish/day (6.7) were all lower than long-term averages (18.4, 2.3, and 7.6,

respectively). Regardless, all estimates were well above the Quality Coldwater Fishery Management Concept. The long-term averages (2006-2016) appear to be skewed, however, due to a couple of anomalous years (2011 and 2013) when estimates were well above the averages. The winter of 2015-2016 provided much needed relief in the Marlette Lake Basin with slightly above average snowpack. Subsequent runoff resulted in a full lake for the duration of the 2016-fishing season.

## Stocking Program

Marlette Lake was stocked four times in 2017. From July through October, the lake received 11,420 fish consisting of 2,629 Pilot Peak LCT, 2,797 Pyramid Lake (contemporary) LCT, and 5,994 rainbow trout (Incline and Tahoe strains). All stocked fish were catchable sized except Pilot Peak LCT, which were, on average, 3.8 inches. One thousand each of Incline and Tahoe strain rainbow trout were tagged with colored Floy tags as part of the “Lake Tahoe Rainbow Trout Study.” The eight-year stocking history is presented in Appendix 1.

**Assist with the trout spawning operation during the spring to ensure fulfillment of eggs for NDOW’s hatchery program.** One day in July was spent conducting spawning activities where 203 rainbow trout and 66 Pyramid (contemporary strain) LCT were hand spawned and resulted in a take of 105,254 eggs. The results of the 2017 Marlette Lake spawning operation are presented in Tables 1 and 2.

**Table 1.** 2017 Marlette Lake Spawning Operation.

Species	Sex	Average Fork Length (mm)	# Spawned
Rainbow	M	323.8	117
Rainbow	F	320.8	86
		<b>322.4</b>	<b>203</b>
LCT (Pyramid)	M	406.9	19
LCT (Pyramid)	F	417.6	47
		<b>413.7</b>	<b>66</b>

**Table 2.** 2017 Marlette Lake Egg Totals.

Species	Egg Totals
Rainbow	45,684
Bowcutt	45,622
Cuttbow	13,948
<b>Total</b>	<b>105,254</b>

Prior to the 2016 spawning operation, it was determined that length and weight would be recorded for the majority of fish spawned in an effort to examine condition (K) of fish in Marlette Lake. Results from fish just prior to being spawned are presented in Table 3. Similar to 2016, all species showed condition factors from fair to poor, with rainbow trout the healthiest. Pilot Peak LCT showed such a low spawning return in 2017 that no weights were recorded or condition factors examined. However, visual

inspection found they were once again in poor condition. Male rainbow trout along with male and female Pyramid LCT showed a small decline in condition, while female rainbows showed limited improvement over last year. The later ice-off in 2017 may have attributed to declines in the majority of fish; however, female rainbow trout did not appear affected. For the second consecutive year, the condition of salmonids in Marlette Lake is classified overall as poor. While the oligotrophic nature of the lake and the short growing season have a marked impact on the condition of the fishery, it is prudent to adjust the stocking program by selecting the species best suited to the productivity of the lake. Phasing out or reducing allocations of less productive species should benefit the fishery and spawning program as a whole.

**Table 3.** Condition Factor of Salmonids in Marlette Lake.

Species	K Value	
	2016	2017
RB Male	1.02	0.97
RB Female	1.14	1.19
Pilot Male	0.83	
Pilot Female	0.90	
Pyramid Male	0.87	0.86
Pyramid Female	1.04	0.97

**Monitor the performance of tagged LCT by utilizing data collected during NDOW spawning operations.** A total of 126 LCT consisting of 41 males and 85 females were captured during spawning operations in 2017, down from 846 captured in 2016. All LCT were identified to strain by the presence (or absence) of an adipose fin clip. Fish with an adipose fin were Pyramid Lake LCT (n=106), while fish without (n=20) were Pilot Peak LCT (Lahontan National Fish Hatchery clips the adipose fin of all Pilot Peak LCT stocked into Marlette Lake). LCT trapping, stocking, and return data is presented in Table 4.

**Table 4.**

2017 NDOW SPAWN STATION DATA				
	# Trapped	Avg. length (mm)	# Stocked Since 2009	%Return
<b>Pilot Peak</b>	<b>20</b>	<b>287.7</b>	<b>20,070</b>	<b>0.1</b>
Male	15	286.2	Stocked 2009 - 2016	
Female	5	292.0		
<b>Pyramid Lake</b>	<b>106</b>	<b>413.7</b>	<b>9,782</b>	<b>1.1</b>
Male	26	406.9	Stocked 2013, '15 and '16	
Female	80	417.6		
<b>Total</b>	<b>126</b>			

When comparing the two different strains of LCT stocked in Marlette Lake, it becomes apparent that the Pyramid Lake LCT is outcompeting the Pilot Peak LCT in all aspects. Since tracking the return rates of each strain beginning in 2015, the Pyramid

LCT has had a higher return rate each year despite that more than double the number of Pilot Peak LCT has been stocked since 2009. In 2017, return of Pyramid LCT to the spawning channel was 9.1 times greater than Pilot Peak LCT.

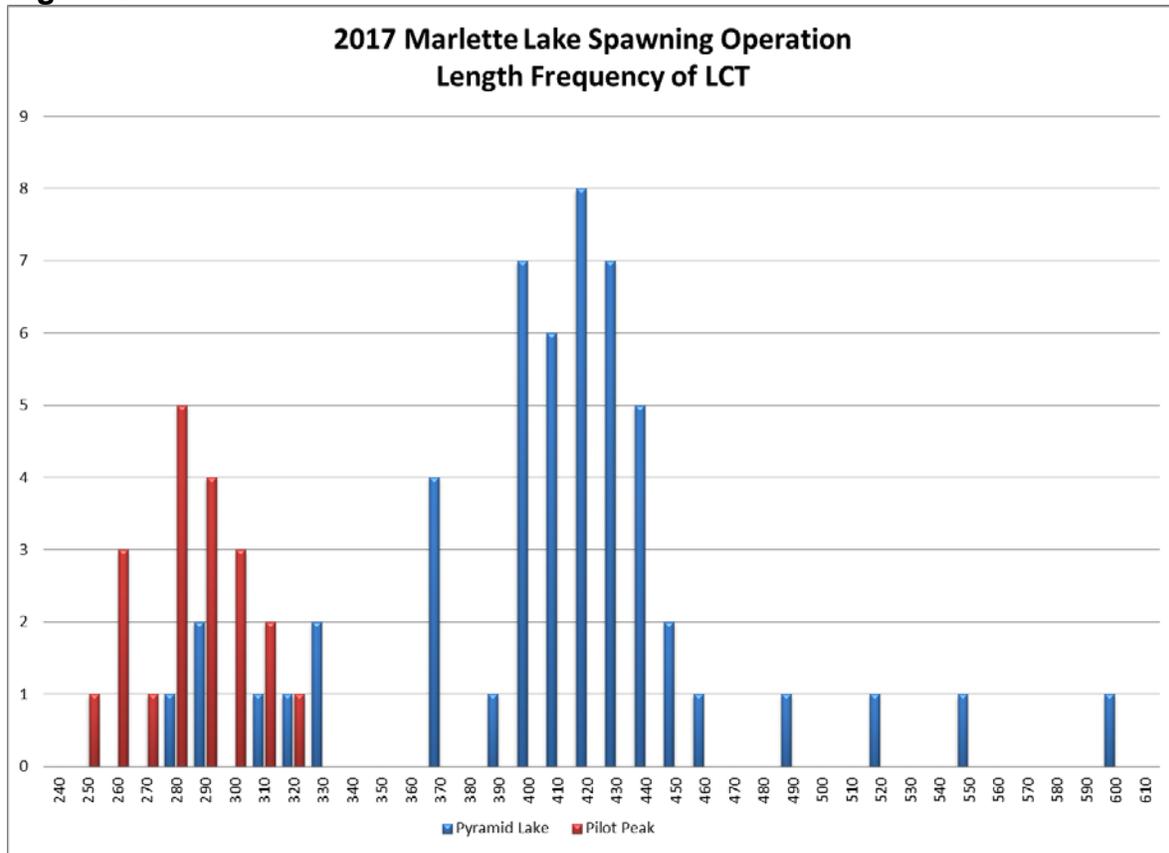
A length frequency analysis in 2017 of both LCT strains (Figure 3) shows for the third consecutive year that Pyramid Lake LCT made up a greater portion of the upper size classes, despite Pilot Peak LCT having been present longer. In 2017, three size classes are observed for Pyramid Lake LCT, and all correspond with their respective stocking dates. Pilot Peak LCT show only one size class and is, on average, smaller than the Pyramid Lake LCT. Based on this, the Pyramid Lake LCT exhibited a 81.2 mm (3.2 in), 95.9 mm (3.8 in), and a 98.9 mm (3.9 in) growth increase per year in fish stocked (2013, 2015, and 2016, respectively) (Table 5). Estimating growth of Pilot Peak LCT is difficult as there is no clearly defined size class corresponding to a stocking date. Comparing the average size of Pilot Peak LCT captured in 2017 to the average size of stocked fish in 2009, there is a minimum growth rate of 7.3 mm (0.3 in) per year in Marlette Lake. A more realistic comparison of fish captured in 2017 to those stocked in 2016 yields a 41.3 mm (1.6 in) per year maximum growth rate. Regardless of the year selected for comparing growth rates, Pyramid LCT do better than Pilot Peak LCT.

**Monitor the performance of tagged rainbow trout by utilizing data collected during NDOW spawning operations.** Tagged rainbow trout in Marlette Lake represent four lots of stocked fish. Three lots were hand-spawned from Third and Incline creeks (2008, 2009, and 2015) while one is the traditional “Tahoe” strain that is spawned at Marlette Lake each year. All lots were hatched and reared at Mason Valley Hatchery and stocked into Marlette Lake to augment the broodstock for the spawning program. Two types of colored Floy tags were used to identify each lot of fish (Table 6).

There were 36-tagged fish captured during the 2017 spawning operation. Tagged fish consisted of one from 2008, seven from 2009, eight Incline strain from 2015, and 20 Tahoe strain from 2015. These made up 8.4 percent of the total rainbow trout captured.

The one fish captured from the 2008 lot measured 510.5 mm (20.1 in), while the average size captured from the 2009 lot was 490.2 mm (19.1 in). Growth rates since these fish were stocked are 33.0 mm per year (1.3 in) over 8 years for the 2008 lot and 35.6 mm per year (1.4 in) over 7 years for the 2009 lot (Figure 4). Since the initial stocking of the Incline strain rainbow trout, there has been a 9.0 percent (2008 lot, n=276) and a 5.1 percent (2009 lot, n=153) return. The longevity and growth rate of the Incline strain rainbow trout are both exceptional for a high altitude oligotrophic system such as Marlette Lake. While only eight fish were captured from these lots during 2017, numerous other fish caught with similar phenotypic characteristics were believed to be Incline strain rainbow trout from the same lots, but they shed their Floy tags at some point. All growth and return data can be found in Table 7.

**Figure 3.**



**Table 5. Growth Rate of Marlette Lake LCT**

Stock Year	Years in Lake	Avg. capture size 2017	Stock Size (mm)	mm growth	mm/year	inches/year
<b>Pyramid Strain</b>						
2016	1	309.7	210.8	98.9	98.9	3.9
2015	2	419.0	227.3	191.7	95.9	3.8
2013	4	540.8	215.9	324.9	81.2	3.2
<b>Pilot Peak Strain</b>						
2009	8	287.7	228.6	59.1	7.4	0.3
2016	1	287.7	246.4	41.3	41.3	1.6

**Table 6. Marlette Lake Tagged Rainbow Trout Lot Identification**

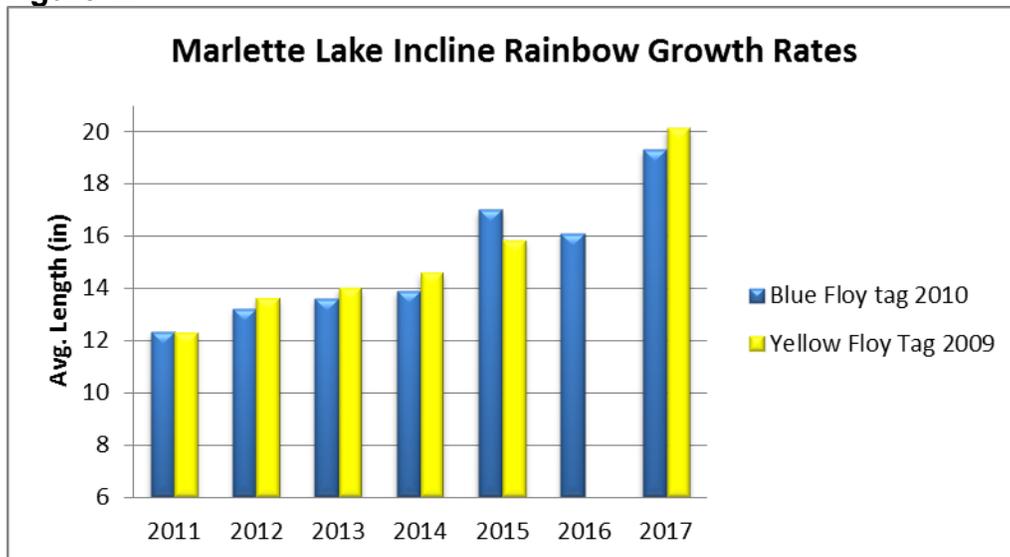
Strain	Spawn Year	Tag Color	Tag Type	Stock Size (mm)	Stock Size (in)
Incline	2008	Yellow	Blank	241.3	9.5
Incline	2009	Blue	Blank	233.7	9.2
Incline	2015	Red	Numbered	215.9	8.5
Tahoe	2015	Yellow	Numbered	223.5	8.8

**Table 7.** Tag Return Data for Incline Strain Rainbow Trout in Marlette Lake

Year Stocked	2010	2009	2010	2009
Tag Color	Blue	Yellow	Blue	Yellow
	Average Size		Number Captured	
Stock Year	9.2	9.5	3065	2986
2010				84
2011	12.3	12.3	30	5
2012	13.2	13.6	24	37
2013	13.6	14	116	21
2014	13.9	14.6	81	2
2015	17	15.8	16	3
2016	16.1		2	
2017	19.3	20.1	7	1
Inch/Year	<b>1.4</b>	<b>1.3</b>		
		Return	276	153
		% Return	<b>9.0</b>	<b>5.1</b>

A comparison of the data collected from the two-tagged lots of fish stocked in 2016 revealed an average size of 269.2 mm (10.6 in) for the Tahoe strain while the average size of the Incline strain was 294.6 mm (11.6 in). The associated growth rates for these fish over their first year in the lake were 45.7 mm (1.8 in) per year for the Tahoe strain and 78.7 mm (3.1 in) per year for the Incline strain. It appears the Incline strain is exhibiting a higher growth rate, while the Tahoe strain is showing a better return. Further analysis will be needed, including examining strain fecundity. All growth and return data can be found in Table 8.

**Figure 4.**



**Table 8.** Comparison Data for Incline and Tahoe Stain Rainbow Trout in Marlette Lake

Year Stocked	2016	2016	2016	2016
Strain	Tahoe	Incline	Tahoe	Incline
Tag Color	Yellow	Red	Yellow	Red
	Average Size		Number Captured	
Stock Year	8.8	8.5	1000	1000
2017	10.6	11.6	20	8
Inch/Year	1.8	3.1		
		Return	20	8
		% Return	2	0.8

### MANAGEMENT REVIEW

Angler success rates of 1.2 fish per hour documented from the Angler Drop-box Survey and 6.7 fish per angler day from the Mail-in Angler Questionnaire Survey meet or exceed the General Coldwater Fishery Management Concept guidelines of 0.30-1.25 fish per hour and 2.0-3.5 fish per angler day. Although use at the lake tends to fluctuate from year to year, fishing remains good for anglers willing to make the 4.5-mile hike. Because the reservoir offers habitat not subject to dramatic fluctuations, trout populations remain stable from year to year. Marlette Lake offers a unique fishing experience and an overall satisfaction rating of 1.3 for fishing experience is on the upper end of the rating scale for most Western Region fisheries.

The winter of 2016-2017 had a negative impact on the 2017 spawning season since there was a delayed ice-off coupled with an inability of fish being able to access the spawning site that lead to fewer fish being captured than during a normal year. The dramatic drawdown of the reservoir in the spring of 2017, because of dam safety concerns, also affected the fish's ability to navigate a large delta at the mouth of the spawning channel. Artificial spawning collected 45,684 rainbow trout, 45,622 bowcutt trout, and 13,948 cuttbow trout eggs, which were well below egg-take goals for the year.

With continued average to above average winters, the Marlette Lake fishery should continue to provide an excellent recreational fishery along with a stable brood stock for the Nevada Department of Wildlife's hatchery program. Condition factors from fish spawned in 2017 suggests there will be another year with a fair to poor ratings for all species within Marlette Lake. The development of the "Marlette Lake Broodstock Management Plan" will be beneficial for providing a framework in which the lake will be stocked each year. This plan will rely heavily on data collected to determine what are appropriate levels of each species and strains of fish to be stocked. The desired goal of the fishery is to maximize the efficiency of the broodstock program while maintaining a quality fishery for the public.

Analysis of both strains of Lahontan cutthroat trout in Marlette Lake has once again shown that the Pyramid strain LCT outcompetes the Pilot Peak strain LCT in all

aspects in Marlette Lake. Pilot Peak LCT were not utilized during spawning activities in 2017 as only five females were captured. While numbers of all species were well below normal, the Pyramid LCT provided a fair amount of individuals for producing bowcutt and cuttbow trout eggs. It is valuable to note that without stocking Pyramid LCT in Marlette Lake there would be a complete absence of bowcutt and cuttbow trout for stocking around the state in 2017. The return rate of Pyramid LCT in 2017 was 1.1 percent of the total number stocked since 2009, while the return of Pilot Peak strain was 0.1 percent stocked since 2009. The calculated growth rate over four years for the Pyramid Lake LCT was 3.2 in per year and extremely impressive considering the oligotrophic nature of Marlette Lake. It is difficult to assess growth rate for the Pilot Peak fish based on the absence of more than one identifiable size class. Utilizing available data, the maximum possible growth rate for Pilot Peak LCT in Marlette Lake is 1.6 in per year (2016 stock year) while the minimum possible growth rate is 0.3 in per year (2009 stock year). The data suggests that the actual growth rate may fall closer to the maximum, but fish may have a limited life expectancy from one to three years based on length data collected. Condition factor (K) for the Pyramid LCT was 0.86 for males and 0.97 for females and are considered poor. No condition factor was calculated for Pilot Peak LCT due to the low number captured. It was noted that Pilot Peak LCT captured were in poor body condition.

Moving forward, it is recommended that Pyramid strain LCT be used for the brood stock program within Marlette Lake. Marlette Lake is a manmade reservoir that is not historic Lahontan cutthroat trout habitat. Based on this and the available data, it is also recommended that Pyramid strain LCT be used for the providing a productive sport fishery. All data collected over the past 8 years has pointed to the Pyramid Strain being more suited to the habitat available within Marlette Lake. The timeline for studying Pilot Peak strain LCT in the spawning and sport fish program is nearing an end. Without a change in the trend observed, this strain has proven not to be a valuable spawning/production resource nor has it provided a benefit to the public.

Data collected from two lots of tagged Incline strain rainbow trout initially stocked in 2009 and 2010 provided valuable information beneficial for future management direction. This strain has shown good growth rates and has a long lifespan, up to nine years old. Fish continue to show up in the spawning trap. The results from these fish led to the "Lake Tahoe Rainbow Trout Study" which compares growth rates, longevity, and fecundity between Incline strain rainbow trout, spawned in Third Creek (Lake Tahoe) with traditional Tahoe strain rainbow, spawned at Marlette Lake. Approximately 1,000-tagged individuals of each strain were stocked into Marlette Lake in 2016. The 2017 spawning season being the year data was collected from these fish. After one year, growth averaged 1.8 inches per year for the Tahoe strain and 3.1 inches for the Incline strain. The observed spawning return was two percent for the Tahoe strain and 0.8 percent for the Incline strain. Another 1,000 of each strain were tagged and stocked into the reservoir in 2017 for continuation of the study.

Years of sediment buildup at the confluence of Trelease Creek and Marlette Lake has led to a shallow bay that appears to hinder the spawning operation when the lake is

not at capacity. It was also noted in 2017 that the sidewalls of the holding pens in the spawning channel are beginning to deteriorate. It is recommended to begin planning improving the spawning channel and corresponding culvert.

### **RECOMMENDATIONS**

- 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 the statewide hatchery program.
- Monitor performance of different strains of LCT by utilizing data collected during spawning operations.
- Monitor performance of different strains of rainbow trout by utilizing data collected during spawning operations.
- Collect fin clips from rainbow trout for genetic analysis to assess the viability of the Marlette Lake rainbow trout broodstock.
- Work with the statewide hatchery supervisor to finalize a broodstock management plan for Marlette Lake.
- Explore replacing the culvert at Trelease Creek and improving the spawning trap.

Prepared By: Travis Hawks  
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Date: November 29, 2017

Appendix 1

Marlette Lake Stocking Summary 2009 - 2016

Year	Species	Number	(in.)	Clips	Comment
2009	Rainbow (Incline)	2986	9.5		Yellow Floy tagged
	LCT (Pilot Peak)	2984	9		Gray Floy Tagged
	<b>Total Rainbow</b>	<b>2986</b>			
	<b>Total LCT (Pilot Peak)</b>	<b>2984</b>			
<b>2009 Total</b>		<b>5970</b>			
2010	Rainbow (Incline)	3065	9.2		Blue Floy tagged
	LCT (Pilot Peak)	2993	9.2	Adipose	
	LCT (Pilot Peak)	500	17.3	Adipose	LNFH broodstock, Pit tagged
	<b>Total Rainbow</b>	<b>3065</b>			
	<b>Total LCT (Pilot Peak)</b>	<b>3493</b>			
<b>Total</b>		<b>6558</b>			
2011	Rainbow (Tahoe)	3001	9.2		
	LCT (Pilot Peak)	1001	9	Adipose	7/25/11
	<b>Total Rainbow</b>	<b>3001</b>			
	<b>Total LCT (Pilot Peak)</b>	<b>1001</b>			
<b>Total</b>		<b>4002</b>			
2012	N/A	0			
<b>Total</b>		<b>0</b>			
2013	LCT (Pyramid Lake)	2857	8.5		
	LCT (Pilot Peak)	730	12.51	Adipose	
	LCT (Pilot Peak)	1918	9.07	Adipose	
	Rainbow (Tahoe)	3000	9.5		
	Rainbow (Tahoe)	3885	9.9		
	Rainbow (Tahoe)	2150	9.9		
	<b>Total Rainbow</b>	<b>9035</b>			
	<b>Total LCT (Pyramid)</b>	<b>2857</b>			
<b>Total LCT (Pilot Peak)</b>	<b>2648</b>				
<b>Total</b>		<b>14540</b>			
2014	LCT (Pilot Peak)	1944	8.9	Adipose	
	Rainbow (Tahoe)	7280	8.8		
	<b>Total Rainbow</b>	<b>7280</b>			
	<b>Total LCT (Pilot Peak)</b>	<b>1944</b>			
<b>Total</b>		<b>9224</b>			

Appendix 1

Marlette Lake Stocking Summary 2009 - 2016

2015	PILOT PEAK	2,778	8	Adipose	
	PILOT PEAK	2,222	8	Adipose	
	PYRAMID LAKE	2,028	9		
	PYRAMID LAKE	2,390	8.9		
	TAHOE	5,596	8.7		
	<b>Total Rainbow</b>	<b>5596</b>			
	<b>Total LCT (Pyramid)</b>	<b>4418</b>			
<b>Total LCT (Pilot Peak)</b>	<b>5000</b>				
<b>Total</b>	<b>15014</b>				
2016	PILOT PEAK	1,500	9.67	Adipose	
	PILOT PEAK	1,500	9.67	Adipose	
	PYRAMID LAKE	2,507	8.3		
	INCLINE	999	8.5		Red Floy tagged
	TAHOE	4,007	8.8		1,000 yellow Floy tagged
	<b>Total Rainbow</b>	<b>5006</b>			
	<b>Total LCT (Pyramid)</b>	<b>2507</b>			
<b>Total LCT (Pilot Peak)</b>	<b>3000</b>				
<b>Total</b>	<b>10513</b>				
2017	PILOT PEAK	2,629	3.8	Adipose	
	PYRAMID LAKE	2,797	9.4		
	INCLINE	999	8.5		Blue Floy tagged
	TAHOE	4,995	8.8		1,000 green Floy tagged
	<b>Total Rainbow</b>	<b>5994</b>			
	<b>Total LCT (Pyramid)</b>	<b>2797</b>			
<b>Total LCT (Pilot Peak)</b>	<b>2629</b>				
<b>Total</b>	<b>11420</b>				
	<b>Total Rainbow</b>	<b>41963</b>			
	<b>Total LCT (Pilot Peak)</b>	<b>22699</b>			
	<b>Total LCT (Pyramid)</b>	<b>12579</b>			
<b>Total</b>	<b>77241</b>				