NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT

FEDERAL AID JOB PROGRESS REPORTS

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2018

Lake Tahoe Rainbow Trout Study
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: *Lake Tahoe Rainbow Trout Study*
Period Covered: *January 1, 2018 through December 31, 2018*

SUMMARY

The 2018 field season posed numerous challenges while monitoring rainbow trout spawning on Third and Incline creeks. A late, but wet winter resulted in erratic runoff in Third Creek, making it difficult to operate the fish weir on Third Creek. During the spawning period, 36 rainbow trout were captured, but none was spawned due to the staggered nature of their arrival in the stream.

The installation of a newly acquired submersible PIT tag reader in 2018 allowed for the passive monitoring of previously tagged fish. The reader was installed on February 28 and operated until June 1.

Wild Incline strain rainbow trout progeny from 2015 and 2016 that were stocked into Marlette Lake, Boulder Reservoir, and Lake Tahoe were captured from these waters in 2018 to investigate growth and return rates. These growth and return rates were then compared to Tahoe strain rainbow trout stocked into the same waters bodies.

In 2018, 4,000 tagged Incline and Tahoe strain rainbow trout were again stocked into Marlette Lake (*n*=2,000) and Lake Tahoe (*n*=1,000). These fish will continue to be monitored for longevity, performance, and fecundity.

BACKGROUND

Lake Tahoe is located in the eastern portion of the Sierra Nevada at an elevation of approximately 6,224 ft. Situated along the California border, approximately 30% of the lake lies within Nevada. It is 22 mi long, 12 mi wide, and has 123,300 SA. The lake holds 122,160,280 AF of water and has a maximum depth of 1,645 ft. Average depth is 989 ft. A natural rim occurs at 6,223.0 ft above MSL, but a permanent concrete dam built in 1913 extends the lake elevation to 6,229.1 ft above MSL. The lake is fed predominantly by snowmelt from 63 streams and the Truckee River is the only natural outlet.

Lake Tahoe was discovered in the 1840's by white explorers and supported robust populations of Lahontan cutthroat trout, mountain whitefish, and a number of other native non-game species. A number of factors including habitat disturbance, competition, and/or predation from introduced fish species, loss of spawning habitat, and commercial harvest led to the extirpation of LCT by the 1940's.

The bulk of the current sport fish community in Lake Tahoe is represented by self-sustaining, wild populations of lake trout, rainbow trout, brown trout, and kokanee salmon.

Densities of introduced, non-native fish species such as largemouth bass, bluegill, and crappie have shown marked increases in recent years. These populations are generally associated with shallow, warm portions of the lake such as the Tahoe Keys Marina. Lake Tahoe also contains populations of native non-game fish including speckled dace, Lahontan redsides, tui chub, Tahoe suckers, and Lahontan mountain suckers. Tributary streams provide permanent, spawning, and rearing habitat for species such as brook trout, brown trout, rainbow trout, and kokanee salmon. Hatchery reared rainbow trout are stocked each year to augment wild populations and enhance sport fishing opportunities.

Several of Nevada's tributaries are crucial to the survival of adfluvial rainbow trout, which are collected, artificially spawned, and released back into the tributaries. Eggs collected are hatched and reared at Mason Valley Fish Hatchery. The progeny from these efforts are used to enhance the genetic diversity of a broodstock population in Marlette Lake. Progeny of Marlette Lake rainbow trout broodstock are then used to support sport fisheries around the state.

OBJECTIVES

- Hand spawn all available adfluvial rainbow trout captured at the Third Creek barrier for propagation in the Mason Valley Fish Hatchery.
- Concurrent with the spawning operation primarily at Incline and Third creeks, measure length and weight, check for Floy tags, and Floy tag all spawning rainbow trout not previously tagged.
- Tag approximately 3,000 Incline strain rainbow trout and 1,000 Tahoe strain rainbow trout to be released in Marlette Lake and Lake Tahoe.
- Assess angler catch/harvest rates and catch location of tagged rainbow trout in all waters stocked along with growth rate through opportunistic angler contacts and return questionnaires at angler drop-boxes.
- Set gillnets for 1 net-night in Boulder Reservoir to assess growth rates of tagged Incline and Tahoe strain rainbow trout.
- Monitor the performance of tagged rainbow trout in Marlette Lake by utilizing data collected during the NDOW spawning operation.
- Conduct adfluvial spawning rainbow trout surveys on Wood Creek, Slaughterhouse Creek, Glenbrook Creek, Marlette Creek, Secret Harbor Creek, and Logan House Creek as time permits.

PROCEDURES

Hand spawn all available adfluvial rainbow trout captured at the Third Creek barrier for propagation in the Mason Valley fish hatchery. A temporary barrier was installed approximately 600 ft (182.88 m) upstream of the Third Creek confluence with Lake Tahoe on March 27, 2018. This barrier stopped the upstream migration of adfluvial rainbow trout and congregated fish immediately downstream. When present and conditions permitted, fish were captured from below the barrier, measured to fork length, weighed, sexed, checked for ripeness, and given individual Floy and PIT tags. During the 2018 field season, no eggs were taken from captured fish. All fish caught were released back into Third Creek below the barrier. Due to an extremely erratic late

winter/early spring weather pattern, the weir was only functional for small periods. High and flashy runoff caused for the barrier to blowout on numerous occasions, which made it difficult to capture a sufficient amount of fish for spawning at any one time.

Concurrent with the spawning operation at Third and Incline creeks and other streams in the basin, measure length, weigh, check for Floy tags, and Floy tag all spawning rainbow trout. Beginning on February 27, 2018, a newly acquired Biomark Submersible Antennae PIT Tag Array was installed approximately 40 ft upstream of the Third Creek confluence with Lake Tahoe. This array allowed for passive monitoring of previously PIT tagged rainbow trout. Also, beginning on March 27, 2018, Third and Incline creeks were monitored for adfluvial rainbow trout ascending the tributaries using a backpack electroshocker. Once captured, fish were measured to fork length, weighed, sexed, checked for ripeness, and given individual Floy and PIT tags. All fish were released back to the creek.

Tag approximately 3,000 Incline strain rainbow trout and 1,000 Tahoe strain rainbow trout to be released in Marlette Lake and Lake Tahoe. On two occasions in 2018, 4,000 Incline and Tahoe strain rainbow trout reared at Mason Valley Fish Hatchery were Floy tagged prior to being stocked into Marlette Lake and Lake Tahoe. Fish were anesthetized in holding tanks and, once sedated, a subset of fish were measured to fork length and weighed. All fish in specific lots were tagged in front of the dorsal fin with colored and individually numbered FD-94 anchor tags. They were then allowed to recover in holding pens within hatchery raceways. Fish were held after tagging for observation and then later stocked into the appropriate water body.

Assess angler catch rates and harvest or catch location of tagged rainbow trout through opportunistic angler contacts and return of angler drop-box surveys. All fish captured during the spawning operation and fish surveys were given individually coded Floy and PIT tags. Anglers reported catching 23-tagged fish for Lake Tahoe during 2018.

Set gill nets for two net-nights in Boulder Reservoir to assess growth rate or previously stocked Incline and Tahoe strain rainbow trout. On September 10, two 150 ft x 6 ft experimental mesh gill nets were set at 0400 hrs and 0415 hrs in Boulder Reservoir. The nets consisted of 1/2, 3/4, 1, 11/2, and 2 in mesh panels. One net was set in the pelagic zone starting at the dam and extending toward the middle of the reservoir while the second net was set in the littoral zone of the north bay. Fish captured were identified, measured to fork length, and weighed with a certified, battery-powered scale. Live fish were returned to the reservoir after processing.

Monitor the performance of tagged rainbow trout in Marlette Lake by utilizing data collected during the NDOW spawning operation. Data (length, weight, and body condition) gathered from tagged rainbow trout were used to compare growth rate, longevity, and performance of Tahoe verses Incline strain rainbow trout in Marlette Lake.

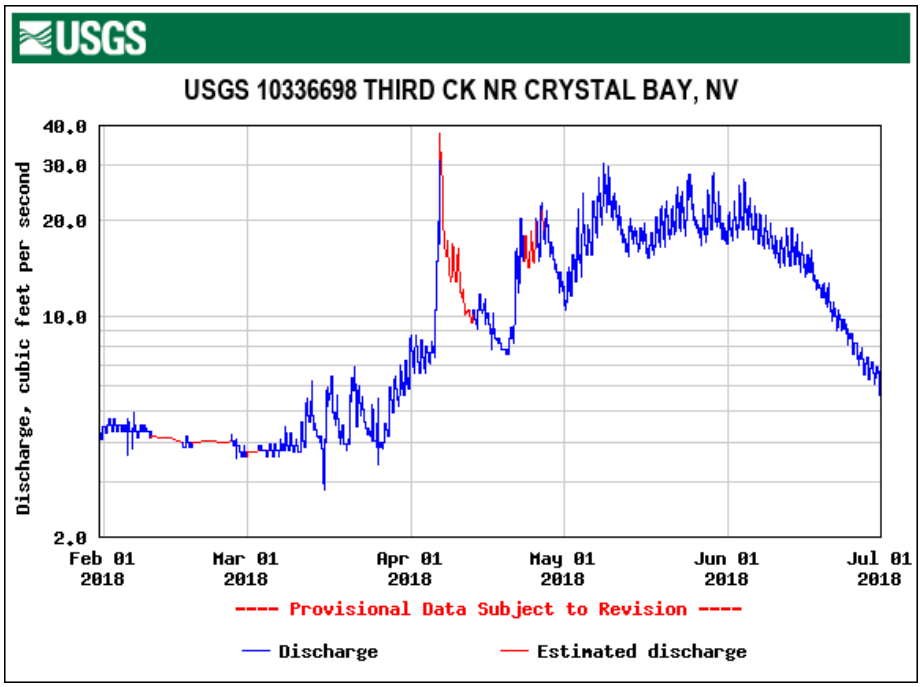
Conduct surveys for adfluvial spawning rainbow trout on Wood Creek, Slaughterhouse Creek, Glenbrook Creek, Marlette Creek, Secret Harbor Creek, and Logan House Creek as time permits. Due to an erratic runoff season and limited access to tributaries, no spawning surveys occurred in 2018.

FINDINGS

Hand spawn all available adfluvial rainbow trout captured at the Third Creek barrier for propagation in the Mason Valley fish hatchery. Beginning on February 27, 2018, Third Creek was passively monitored for adfluvial rainbow trout with a submersible PIT tag reader. A more intensive effort including the installation of a weir began on March 27.

The installation of a temporary barrier on Third Creek allowed for assessment of rainbow trout attempting to ascend the tributary while at the same time enabled the capture of fish for tagging and artificial spawning. Of the 24 rainbow trout caught, none was spawned. Flows during the 2018 season fluctuated widely with an extremely flashy runoff pattern (Figure 1) and, therefore, it was difficult to maintain the barrier for capturing adfluvial fish. There was never an adequate number of fish captured for spawning at any one time. The barrier washed out numerous times and was ultimately removed in late April. Fish were allowed to move freely throughout the system. Numerous fish were observed during subsequent electroshocking surveys, but were unable to be captured.

Figure 1. Third Creek Flow Rate.



The 2018 spawning run began on February 28, with an initial male rainbow trout initially tagged in 2016 entering Third Creek. This is approximately a month earlier than the first detection in 2017, but the use of a PIT tag reader will enable a more thorough

examination of fish movement in the system. When estimating the peak (No. fish/day) of the 2018 spawning run using the "traditional method" (i.e., fish sampling at the weir), it appeared to come on April 24. Since 2015, there have generally been two spawning peaks with the first of each year occurring around April 20 and the second around May 4 (Figure 2). This trend was seen again in 2018 using the traditional method. However, utilizing the data collected from the PIT tag reader, the greatest fish activity entering Third Creek occurred from March 30 to April 10 (Figure 3). While there were still two peaks, they occurred roughly two weeks before detecting it through the traditional method. This is helpful moving forward to better time the capture of fish for the spawning program.

Figure 2.

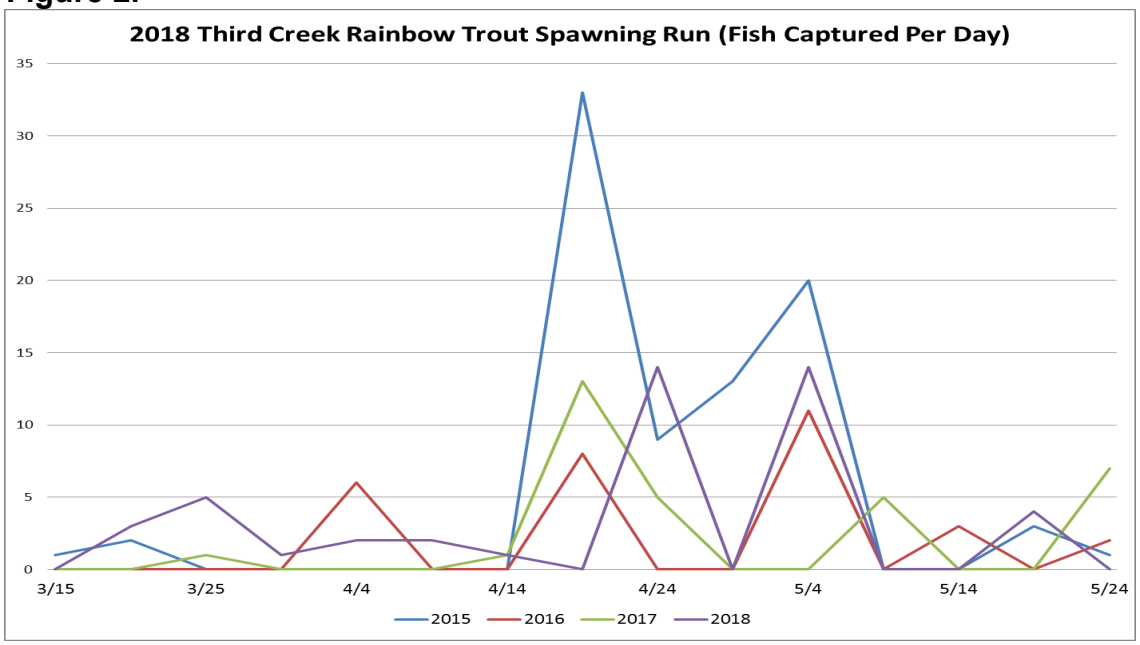
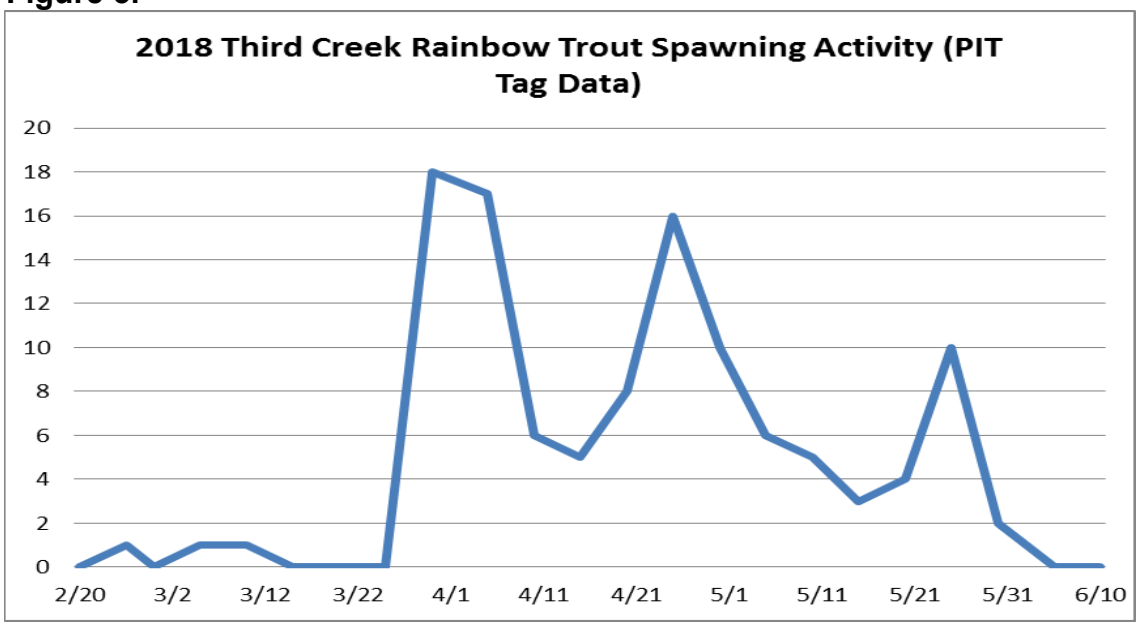


Figure 3.



Incline Creek was monitored daily from Lake Tahoe upstream to the Lakeshore Blvd Bridge. Because there was no barrier, fish were free to move upstream as far as necessary. Visual monitoring with limited electroshocking occurred and resulted in the capture of 11 total fish in 2018.

Concurrent with the spawning operation at Third and Incline creeks and other streams in the basin, measure length, weigh, check for Floy tags, and Floy tag all spawning rainbow trout. All adfluvial rainbow trout captured in Third and Incline creeks in 2018 were monitored for Floy and PIT tags. If a fish was not tagged, then it was measured to fork length, weighed, and fitted with both Floy and PIT tags. Thirty-six rainbow trout were captured in Incline Creek, Third Creek, and Rosewood Creek (a tributary to Third Creek) in 2018 (Tables 1 and 2).

Table 1. Incline Strain Rainbow Trout Spawning Data for 2015 - 2018.

	n	FL (mm)	Weight (g)
M	27	447	1,149
F	32	472	1,121
2015	**59**		
M	16	374	693
F	14	476	1,310
2016	**30**		
M	16	373	766
F	11	450	1,102
2017	**27**		
M	14	376	757
F	11	439	1,066
2018	**25**		

*Includes Rosewood Creek Tributary

Table 2. Incline Creek Spawning Data, 2018.

	n	FL (mm)	Weight (g)
M	6	433	760
F	5	389	983

During 2018, 29 percent of the fish were recaptures (Table 3), being caught and tagged at the weir from 2015 to 2017 or from the 4,000-tagged fish spawned from Third and Incline creeks in 2015 and 2016 and stocked at Cave Rock (Lake Tahoe) in 2016 and 2017. For the purposes of analysis, these rainbow trout have been separated into two groups, adfluvial wild fish (*n*=3) and hatchery-raised fish (*n*=8).

Of the three adfluvial fish caught, two were previously captured one other time. Both fish were males with one being initially captured in 2016 while the other was initially captured in 2017. The third wild fish was a female initially tagged in 2015 and captured again in 2016 and 2018. Since being tagged, this fish grew 118 mm. Interestingly, she was caught within a 7-day period of each year, regardless of flow rates and water temperatures. All three fish were initially tagged in Third Creek and recaptured in Third Creek, continuing to support that fish show spawning site fidelity.

Table 3. Wild Adfluvial Rainbow Trout Recapture in 2018.

2nd Year Capture	Capture Date	Mark Date	Initial Capture	Recapture (mm)	Growth (mm)	K Factor
Third (M)	4/5/2018	4/20/2016	455	485	30	
Incline (M)	4/27/2018	4/20/2017	460	473	13	0.95
Average			**458**	**479**	**22**	**0.95**
3rd Year Capture						
Third (F)	4/27/2018	4/21/2015	410	518	118	1.21
Average			**410**	**518**	**118**	**1.21**

Eight stocked fish were recaptured in 2018 (Table 4). Fish were initially raised to catchable size at Mason Valley Fish Hatchery, tagged with individually numbered yellow and red Floy tags, and stocked at the Cave Rock boat ramp, Lake Tahoe, in late summer 2016 and 2017. Prior to stocking, individual lengths were measured for examining growth rates. In 2018, yellow-tagged fish (3 years old) showed an average growth of 95.3 mm (total since stocked) at recapture, with a range from 44 to 131 mm and average of 5.3 mm/mo. Red-tagged fish (2 years old) showed an average growth of 75.4 mm (total since stocked) at recapture, with a range from 31 to 117 mm and average of 8.3 mm/mo (Table 4). Five fish were captured form Third and Rosewood creeks, while three were caught from Incline Creek. All but two of these fish were captured ascending the tributaries during the spawn, and the remaining two were caught from the lowest reach of Third Creek on August 1. Fish appeared to be following a large influx of Lahontan redsides spawning in Third Creek. Redsides are part of the forage base and rainbow trout exhibited an extremely healthy appearance.

Table 4. Incline Strain Rainbow Trout Recaptured in 2018 (lengths in mm).

Capture Location	Sex	Capture Date	Tagging (mm)	Capture (mm)	Growth	mm/month
Red Floy tag - Spawned in 2016, stocked in September of 2017						
Third	M	3/27	229	260	31	4.4
Incline	M	4/27	229	278	49	6.1
Rosewood	M	4/10	229	346	117	14.6
Third	M	8/1	229	330	101	9.2
Third	M	8/1	229	308	79	7.2
Average			229.0	304.4	75.4	8.3
Yellow Floy tag - Spawned in 2015, stocked in September of 2016						
Third	M	4/3	286	330	44	2.4
Incline	M	3/22	268	399	131	7.7
Incline	M	5/22	254	365	111	5.8
Average			242.4	364.7	95.3	5.3

A Biomark Submersible PIT tag array was installed near the Third Creek terminus to Lake Tahoe on February 27, 2018. This array allowed for passive monitoring of tagged wild rainbow trout as they entered and exited Third Creek. In all, the tag reader showed 113 detections from February 28 to May 30. Twenty-six were unique (only detected once) and, of these, 11 were recaptures from previous years. This represented 7.9 percent of the 140 wild rainbow trout (verses stocked) that have been PIT tagged since this study began in 2015. Fifteen were detections of newly tagged fish moving out of Third Creek

and back into Lake Tahoe. By comparison, only three fish were recaptured using the traditional method of sampling. This data shows that a number of fish entering the tributaries to spawn were never being captured despite the weir being installed several hundred feet upstream.

The average number of detections for each tag was 4.4, with a range from 1 to 20. Of the 11 recaptured PIT-tagged fish, the average time between their first and last detection was 18.5 days, with a range from 1 to 82 days. This was slightly skewed by one male detected entering and exiting the system 20 times over 82 days. It was possible, but unknown, whether the presence of the barrier (weir) influenced his constant movements. Attachment 1 provides a summary of detection data.

Tag approximately 3,000 Incline strain rainbow trout and 1,000 Tahoe strain rainbow trout to be released in Marlette Lake and Lake Tahoe. There were 4,000 rainbow trout (3,000 Incline strain and 1,000 Tahoe strain) tagged in 2018 and stocked into Lake Tahoe and Marlette Lake where growth and performance were monitored (Table 5). Data from a comparison study between these two strains will provide which will be the best-suited fish for a recreational fishery.

Table 5. Tagged Rainbow Trout Stocking by Water Body in 2018.

Water	Strain	Number	FL (mm)	Weight (g)	K-Factor	Color
Marlette	Incline	1,000	218.13	142.86	1.38	White
	Tahoe	1,000	181.90	210.26	1.50	Orange
Tahoe	Incline	2,000	219.29	151.50	1.44	White

Assess angler catch rates and harvest or catch location of tagged rainbow trout through opportunistic angler contacts and return of angler drop-box surveys. Throughout 2018, anglers reported catching six yellow-tagged trout to the phone number listed on the Floy tag. A yellow-tagged fish was affixed to Incline strain rainbow trout stocked at Cave Rock, Lake Tahoe. These were the offspring of wild rainbow trout caught from Third and Incline creeks and artificially spawned in 2015 and stocked in 2016. Anglers caught fish as far south as Skunk Harbor to as far north as Crystal Bay, Speedboat Beach. One individual fish was reported from near the mouth of Blackwood Creek on the opposite western shoreline of the lake.

Anglers also caught 13 red-tagged fish, with several reported from Meeks Bay and Rubicon Point on the western shore. Red-tagged fish came from two tagging events, the first were wild adult fish caught from Third and Incline creeks. They were tagged and immediately released. The second were offspring of wild rainbow trout caught from Third and Incline creeks in 2016 and stocked at Cave Rock in 2017. Four white-tagged rainbow trout were also reported. These are offspring of wild rainbow trout spawned in 2017 and stocked in the late summer of 2018 from the Cave Rock boat launch to Crystal Bay. Attachment 2 depicts the reported catch locations of all tagged fish from 2018.

Two years of collecting angler catch data shows that hatchery-raised offspring of wild Lake Tahoe rainbow trout are capable of persisting and dispersing around the lake.

When viewing creel survey data and spawning data, they suggests that augmenting the wild fishery in Lake Tahoe with hatchery raised wild strain rainbow trout is feasible.

Set gill nets for two net-nights in Boulder Reservoir to assess growth rate or previously stocked Incline and Tahoe strain rainbow trout. On September 10, 33 rainbow trout were captured and only three were Floy-tagged. Two yellow-tagged fish averaged 290 mm while a single blue-tagged fish was 273 mm (Table 6). Yellow and blue tags represent Incline strain rainbow trout stocked in 2016 and 2017, respectively. No tagged Tahoe strain rainbow trout were caught in 2018 for comparing strain growth rates.

Table 6. Boulder Reservoir Hatchery Rainbow Strain Evaluation.

	Fork Length (mm)			Weight (g)			K Factor	
Strain (Year stocked)	**Stocking**	**2018**	**% increase**	**Stocking**	**2018**	**% Increase**	**Stocking**	**2018**
Incline (2016)-yellow tag	239	290	**21.30**	205	275	**34.14**	1.35	1.13
Incline (2017)-blue tag	190	273	**43.70**	92	226	**145.65**	1.34	1.17

Monitor the performance of tagged rainbow trout in Marlette Lake by utilizing data collected during the NDOW spawning operation. During the 2018 spawning operation at Marlette Lake, the 238 rainbow trout caught showed four different Floy tag configurations (Table 7). Tagged fish were reared in MVH and stocked into Marlette Lake in 2009, 2010, 2016, and 2017 for augmenting the broodstock program and for comparing a number of traits between strains. This was substantially more tagged fish than was captured in 2017 (*n*=28) (see Figures 8 and 9 for 2016 and 2017 captured fish).

Table 7. Marlette Lake Tagged Rainbow Strain Comparison 2018

Year Stocked	Color	Number	Return (%)	Avg. Wt (g)	Avg. L (mm)	K factor	Growth
Tahoe Strain							
2016	Yellow	29	2.9	242.6	287.2	1.02	63.7
2017	Green	174	17.4	178.6	256.4	1.06	46.1
Incline Strain							
2016	Red	14	1.4	232.9	283.6	1.02	67.7
2017	Blue	21	2.1	255.3	285.7	0.96	60.3

Table 8. Three Year Old Tagged Rainbow Growth and Return 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
2018	11.3	11.2	29	14
Inch/Year	**1.25**	**1.35**		
		Return	49	22
		% Return	**4.9**	**2.2**

Table 9. Two Year-Old Rainbow Growth Rate and Return in Marlette Lake

Year Stocked	2017	2017	2017	2017
Strain	Tahoe	Incline	Tahoe	Incline
Tag Color	Green	Blue	Green	Blue
	Average Size	**Number Captured**		
Stock Year	8.3	8.9	1000	1000
2018	10.1	11.2	174	21
Inch/Year	**1.8**	**2.3**		
	Return	174	21	
	% Return	**17.4**	**2.1**	

A comparison of average sizes between the Tahoe and Incline strains caught in 2018 mimics the results displayed in 2017 (Table 7). However, Tahoe strain rainbow trout return to spawn at a higher percentage than Incline strain rainbow trout (Table 7).

Six blue Floy-tagged fish were also captured in 2018 from Incline strain rainbow trout initially spawned from Incline Creek in 2009, reared at MVH, and stocked in Marlette Lake in 2010. These fish exhibited exceptional longevity and averaged 432.8 mm and appeared to be viable spawners.

Conduct surveys for adfluvial spawning rainbow trout on Wood Creek, Slaughterhouse Creek, Glenbrook Creek, Marlette Creek, Secret Harbor Creek, and Logan House Creek as time permits. Due to heavy, erratic runoff and limited access to these tributaries, no spawning surveys were carried out in 2018.

STUDY REVIEW

Similar to 2017, the 2018 field season posed numerous challenges during the rainbow trout spawning period on Third and Incline creeks. A late but wet winter resulted in erratic runoff in Third Creek. High flows made it nearly impossible to maintain the temporary weir on a consistent basis. While a similar number of adfluvial rainbow trout were captured in 2017 relative to 2016, more were visually observed during electroshocking surveys. For the third consecutive year, fish were recaptured, further supporting that wild Lake Tahoe Rainbow trout exhibit some level of site fidelity to spawning grounds. However, fewer fish were caught during the 2018 spawning season and no fish were spawned due to the staggered nature of fish arriving in the stream.

The installation of a Biomark submersible PIT tag reader to monitor the movement of tagged rainbow trout in the Third Creek system proved to be beneficial. The array revealed individual fish entered and exited the system more times during the spawning season than previously believed. For example, the traditional method of electroshocking to assess fish presence missed 73 percent of the fish that the PIT tag reader identified. Since a portion of fish utilizing Third Creek to spawn was tagged, it is possible that a larger number of fish assess Third Creek than previously understood. An improvement to the weir structure and/or installing a trap in 2019 will likely increase the capture percentage and provide additional supporting data.

Monitoring growth and performance from 7,200 Incline strain rainbow trout stocked between 2016 and 2017 into Boulder Reservoir (*n*=1200), Lake Tahoe (*n*=4,000), and Marlette Lake (*n*=2,000) revealed similar trends to those observed in 2017. During this second year of analysis, it appeared that the Incline strain in Marlette Lake (a higher elevation, oligotrophic lake) outperformed the Tahoe strain in terms of growth rate. This is not surprising since Incline strain rainbow trout also responds favorably in Lake Tahoe, which has a similar less productive environment.

When comparing returns of rainbow trout from the spawning trap in Trelease Creek, a tributary of Marlette Lake, the number of Tahoe strain more than quadrupled that of the Incline strain. However, this is only the second year of observations and as fish mature, it is expected more fish from each strain will want to spawn and increase its use of the trap.

In summary, continued monitoring of Lake Tahoe wild rainbow trout and their offspring within a number of water bodies will provide a valuable comparison on life history characteristics and strain performance. The species showing the promise of long-term benefits to sportsmen will be chosen for improving the fisheries within the region.

RECOMMENDATIONS

- Hand spawn all available adfluvial rainbow trout captured at the Third Creek barrier for propagation at Mason Valley Fish Hatchery.
- Install and monitor a PIT tag array for movement of spawning rainbow trout into and out of Third Creek
- Concurrent with the spawning operation at Third Creek, Incline Creek, and other creeks in the basin, measure length, weigh, check for Floy tags, and Floy tag untagged spawning rainbow trout.
- Assess catch rates, harvest or catch location, and growth rate of tagged rainbow trout through opportunistic angler contacts and return of angler drop-box data in Lake Tahoe.
- Set gill nets in Boulder Reservoir to assess growth rates of tagged Incline and Tahoe strain rainbow trout.
- Monitor the performance of tagged rainbow trout in Marlette Lake by utilizing data collected during the spawning operation.
- Conduct surveys for adfluvial spawning rainbow trout in Wood Creek, Slaughterhouse Creek, Glenbrook Creek, Marlette Creek, Secret Harbor Creek, and Logan House Creek as time permits.

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Western Region

Date: November 29, 2018

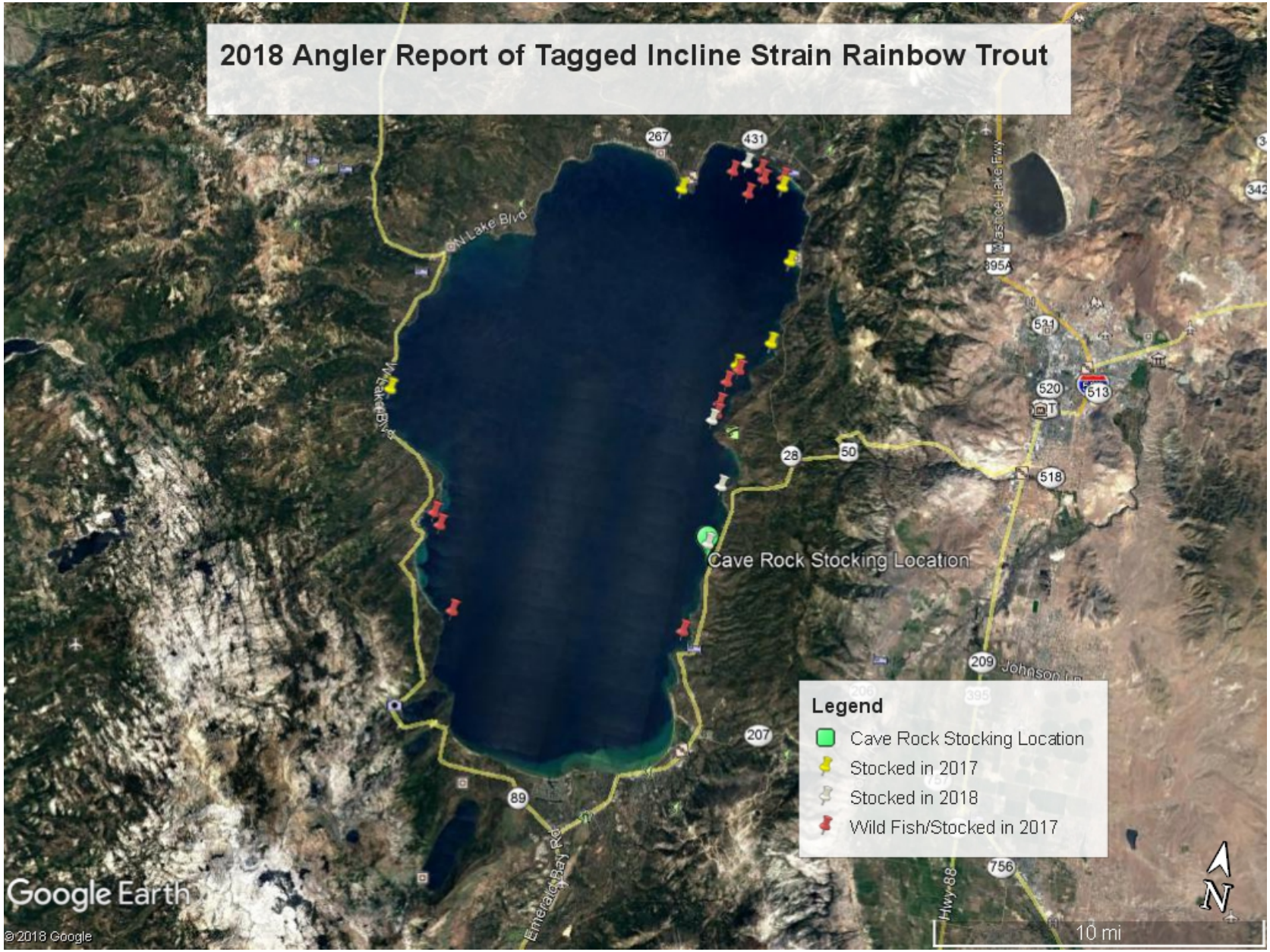
Attachment 1

2018 Submersible PIT Tag Array Compiled Data

Scan Date	Scan Time	DEC Tag ID	Sex	Is Duplicate	Years Detected	Captured in '18	New in '18	Handle Date (2018)	Detections	Last Detection	Days Present
02.28.2018	20:07:07.120	900.118001049518	M		2016	x		4/5,4/27,5/22	20	5/22	82
03.09.2018	20:04:59.060	900.118001066810	M		2017				9	4/6	28
03.13.2018	22:48:30.720	900.118001049518		Yes							
03.31.2018	19:06:15.360	900.118001066810		Yes							
03.31.2018	19:29:58.560	900.118001049518		Yes							
03.31.2018	19:37:59.670	900.118001066810		Yes							
03.31.2018	20:51:56.760	900.118001038928	M		2017	x		4/27	7	4/19	27
04.01.2018	02:17:40.140	900.118001049518		Yes							
04.01.2018	02:19:13.940	900.118001038928		Yes							
04.01.2018	19:06:57.210	900.118001066810		Yes							
04.02.2018	18:28:48.780	900.118001033152	F		2016				1	4/2	1
04.02.2018	19:53:32.680	900.118001038928		Yes							
04.02.2018	20:46:39.010	900.118001066810		Yes							
04.02.2018	21:13:19.080	900.118001038928		Yes							
04.02.2018	22:28:53.180	900.118001049518		Yes							
04.02.2018	22:29:45.890	900.118001038928		Yes							
04.02.2018	22:32:18.220	900.118001049518		Yes							
04.02.2018	22:32:23.570	900.118001038928		Yes							
04.03.2018	19:22:03.390	900.118001049518		Yes							
04.03.2018	20:47:33.850	900.118001047373	M		2017				12	4/25	22
04.04.2018	22:41:38.500	900.118001066810		Yes							
04.05.2018	21:41:53.170	900.118001051110	F		2015, 2016, 2017				2	4/12	7
04.05.2018	21:48:40.110	900.118001066810		Yes							
04.05.2018	23:04:22.600	900.118001046193	F		2016, 2017				5	4/26	21
04.05.2018	23:26:29.850	900.118001047373		Yes							
04.06.2018	13:42:20.870	900.118001049518		Yes							
04.06.2018	13:46:20.740	900.118001066810		Yes							
04.06.2018	13:47:38.020	900.118001049518		Yes							
04.06.2018	13:50:38.030	900.118001066810		Yes							
04.06.2018	13:51:01.710	900.118001049518		Yes							
04.06.2018	18:22:12.990	900.118001047373		Yes							
04.07.2018	13:28:35.060	900.118001046193		Yes							
04.08.2018	05:02:21.890	900.118001049518		Yes							
04.08.2018	18:45:50.230	900.118001047373		Yes							
04.08.2018	20:52:39.440	900.118001046193		Yes							
04.09.2018	11:56:54.570	900.118001047373		Yes							
04.09.2018	18:12:58.810	900.118001049518		Yes							
04.09.2018	21:13:57.800	900.118001044974	F			X	X	4/5	1	4/9	
04.10.2018	03:31:35.150	900.118001047373		Yes							

04.10.2018	14:26:26.420	900.118001049518		Yes							
04.12.2018	21:01:36.950	900.118001051110		Yes							
04.12.2018	23:57:25.910	900.118001047373		Yes							
04.14.2018	05:23:42.890	900.118001053282	M			X	X	4/10	10	5/10	
04.14.2018	20:01:23.290	900.118001046193		Yes							
04.15.2018	20:23:16.440	900.118001047373		Yes							
04.18.2018	02:14:34.600	900.118001049518		Yes							
04.19.2018	19:45:07.270	900.118001053282		Yes							
04.19.2018	21:46:09.400	900.118001047373		Yes							
04.19.2018	21:53:57.550	900.118001038928		Yes							
04.20.2018	23:14:19.890	900.118001047373		Yes							
04.21.2018	22:28:08.700	900.118001053282		Yes							
04.22.2018	00:08:36.920	900.118001047373		Yes							
04.22.2018	01:32:22.870	900.118001049518		Yes							
04.22.2018	18:53:19.590	900.118001055588	F		2015, 2016	x		4/27	1	4/22	1
04.23.2018	02:58:40.390	900.118001052614	F		2017				1	4/23	1
04.23.2018	06:43:47.100	900.118001049518		Yes							
04.24.2018	22:04:56.010	900.118001043451	F		2015, 2016				4	5/5	12
04.25.2018	20:11:23.580	900.118001047373		Yes							
04.26.2018	12:50:29.050	900.118001049518		Yes							
04.26.2018	19:15:02.710	900.118001046193		Yes							
04.27.2018	11:29:13.850	900.118001045034	M			X	X	4/27	2	5/7	
04.27.2018	12:01:15.980	900.118001052653	M			X	X	4/18	7	5/22	
04.27.2018	13:18:59.610	900.118001040043	F			X	X	4/27	2	5/26	
04.27.2018	20:25:00.730	900.118001043451		Yes							
04.27.2018	20:43:29.430	900.118001044338	F			X	X	4/27	2	5/2	
04.27.2018	21:27:04.070	900.118001048559	M			X	X	4/27	6	5/3	
04.27.2018	21:38:45.390	900.118001035130	F			X	X	4/27	4	5/25	
04.28.2018	04:52:30.940	900.118001053282		Yes							
04.28.2018	08:53:35.640	900.118001048559		Yes							
04.28.2018	20:54:51.100	900.118001053282		Yes							
04.28.2018	22:51:32.780	900.118001048559		Yes							
04.29.2018	04:17:29.120	900.118001053282		Yes							
04.29.2018	14:12:57.580	900.118001048559		Yes							
04.30.2018	16:20:49.750	900.118001049518		Yes							
04.30.2018	20:05:51.390	900.118001053282		Yes							
05.01.2018	01:48:40.070	900.118001052653		Yes							
05.01.2018	19:35:26.060	900.118001048559		Yes							
05.01.2018	20:21:42.720	900.118001052873	F		2015, 2016, 2017				1	5/1	1
05.01.2018	21:21:33.740	900.118001043451		Yes							

05.01.2018	22:16:22.010	900.118001053282		Yes							
05.02.2018	19:23:45.100	900.118001044338		Yes							
05.02.2018	19:23:50.020	900.118001053282		Yes							
05.03.2018	08:52:17.400	900.118001048559		Yes							
05.05.2018	00:35:18.790	900.118001043451		Yes							
05.06.2018	18:47:40.460	900.118001052653		Yes							
05.07.2018	04:51:22.800	900.118001045034		Yes							
05.08.2018	08:48:06.480	900.118001052653		Yes							
05.08.2018	16:31:09.280	900.118001036122	M			X	X	5/8	2	5/10	
05.08.2018	17:38:57.400	900.118001053362	F			X	X	5/8	1	5/8	
05.10.2018	04:28:01.240	900.118001036122		Yes							
05.10.2018	22:35:10.870	900.118001053282		Yes							
05.11.2018	21:47:41.460	900.118001052653		Yes							
05.13.2018	07:33:41.710	900.118001047081	M			X	X	5/8	2	5/17	
05.13.2018	21:49:12.750	900.118001052653		Yes							
05.16.2018	02:05:40.240	900.118001035130		Yes							
05.17.2018	10:30:19.300	900.118001047081		Yes							
05.18.2018	15:46:47.800	900.118001049518		Yes							
05.22.2018	10:30:39.380	900.118001052653		Yes							
05.22.2018	18:55:22.450	900.118001049518		Yes							
05.24.2018	22:07:16.760	900.118001035130		Yes							
05.24.2018	23:29:48.110	900.118001050496	M			X	X	3/27	1	5/24	
05.25.2018	05:27:06.970	900.118001035130		Yes							
05.26.2018	04:14:49.940	900.118001040043		Yes							
05.26.2018	20:51:34.350	900.118001045698	M			X	X	3/25	4	5/30	
05.27.2018	23:52:09.080	900.118001045907	F			X	X	3/25	4	5/29	
05.27.2018	23:52:15.790	900.118001045698		Yes							
05.28.2018	04:03:00.040	900.118001045907		Yes							
05.28.2018	20:14:06.490	900.118001045698		Yes							
05.28.2018	21:10:01.230	900.118001045907		Yes							
05.29.2018	01:18:17.140	900.118001068267	M			X	X	4/27	2	5/30	
05.29.2018	02:06:19.720	900.118001045907		Yes							
05.30.2018	02:21:14.800	900.118001068267		Yes							
05.30.2018	12:30:37.330	900.118001045698		Yes							


2018 Angler Report of Tagged Incline Strain Rainbow Trout
Cave Rock Stocking Location
Legend
Cave Rock Stocking Location
Stocked in 2017
Stocked in 2018
Wild Fish/Stocked in 2017
Google Earth
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