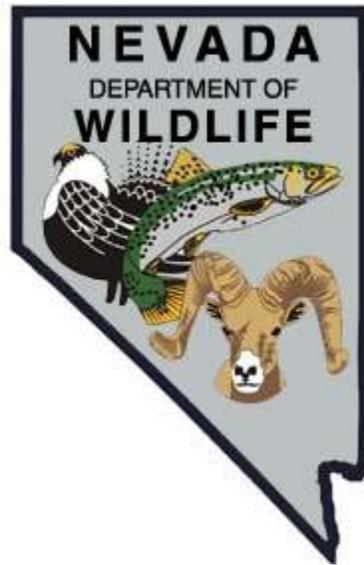


NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-53
2017

REDBAND TROUT
EASTERN REGION



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

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

State: *Nevada*
Project Title: *Statewide Fisheries Program*
Job Title: *redband trout*
Period Covered: *January 1, 2017 through December 31, 2017*

SUMMARY

The Inland Redband Trout Conservation Agreement with Conservation Strategies, in conjunction with the Nevada Department of Wildlife Redband Trout Species Management Plan, provided guidance for activities completed during 2017.

Lower Canyon Creek and Cottonwood Creek in the Salmon Falls drainage were surveyed to determine the status of the redband trout populations present. A small redband trout population was documented, with three age classes present in Lower Canyon Creek. A sizeable brook trout population was also documented. Additionally, a large trout population was present in Cottonwood Creek and further genetic testing will be needed to determine the level of introgression (if any) with hatchery rainbow trout or cutthroat trout.

Flat Creek and McDonald Creek in the Bruneau River drainage were both surveyed. A very large and healthy redband trout population was documented in McDonald Creek, with several age classes present. A smaller population of redband trout was documented in Flat Creek, as well as a sizeable brook trout population.

Dolly Creek in the Bruneau River drainage was opportunistically surveyed in 2017. The entirety of Dolly Creek was located on private land and the landowner contacted the Nevada Department of Wildlife requesting a fishery. No redband trout were located during the survey. Following the survey, 106 redband trout from the Bruneau River were reintroduced into Dolly Creek, with future reintroduction efforts warranted.

Additionally, the landowner of Mason Creek Reservoir contacted the Nevada Department of Wildlife with concerns for the fishery. During previous fishing trips, the landowner was unable to catch any redband trout and was concerned that it had been extirpated from the reservoir. A single gill net was placed overnight in Mason Creek Reservoir and a redband trout population with several age classes was documented.

Due to time constraints, flow conditions, and a significant amount of time spent on other grants, Caudal, Silver, Breakneck, Cap Winn, Frost, Beaver, and Lime creeks were not surveyed in 2017.

The Nevada Department of Wildlife Redband Trout Species Management Plan is currently being revised with the hopes of a draft being available in 2018.

OBJECTIVES and APPROACHES

Objective: Native Sport Fish Management

Approaches:

- Survey BLM and private portions of Canyon Creek in the Salmon Falls drainage to determine redband trout status and current fish assemblage.
- Survey Flat and Caudal creeks in the East Fork Bruneau River drainage to determine redband trout status and to document the extent of brook trout invasion.
- Survey Silver, Breakneck, Cap Winn, and Frost creeks in the South Fork Owyhee River drainage to determine redband trout status and current fish assemblage.
- Survey Beaver Creek in the East Fork Owyhee River drainage to determine redband trout status and current fish assemblage.
- Survey Cottonwood Creek and Lime Creek in the Salmon Falls River drainage to determine redband trout status and current fish assemblage.
- Survey McDonald Creek in the Bruneau River drainage to determine redband trout status and current fish assemblage.
- Revise the Nevada Department of Wildlife Redband Trout Species Management Plan.

PROCEDURES

A Smith Root LR-20B backpack electroshocker was used to collect fish during all surveys. Table 1 is a summary of 2017 redband trout surveys.

Table 1. 2017 redband trout survey summaries.

Stream	Number of Sample Sites	Length of Sample Sites (m)
Canyon Creek	5	50
Flat Creek	6	50
Cottonwood Creek	12	50
McDonald Creek	12	50
Dolly Creek	10	50

All fish population sampling included multiple upstream passes through the sample area. After sample sites were electroshocked, all game fish were identified and measured (mm, TL). Additionally, the presence of all endemic non-game fish was recorded.

FINDINGS

BLM and Private Portions of Canyon Creek

A total of 14 redband trout and 10 brook trout were sampled during the survey. Redband trout were present at three out of five sampling stations, while brook trout were only present at two (Table 2; Map 1). Table 3 shows the results of the survey.

Table 2. Date, UTM, water temperature, and number of redband trout and brook trout present at each station on Lower Canyon Creek on September 26, 2017.

Station	Date	# RB Present	#BK Present	UTM E	UTM N	H2O Temp
Lower Canyon 3	9/26/2017	0	0	660439	4628320	45
Lower Canyon 4	9/26/2017	2	0	657600	4628599	46
Lower Canyon 5	9/26/2017	0	0	655727	4630385	51
Lower Canyon 6	9/26/2017	1	5	656700	4633522	49
Lower Canyon 7	9/26/2017	11	5	655181	4636127	50

Table 3. Station, station length, number of redband trout first pass, number redband trout second pass, station population estimate (N), and estimated fish per mile for Lower Canyon Creek on September 26, 2017.

Station	Length (m)	# RB First Pass	# RB Second Pass	N	Fish/Mile
Lower Canyon 3	50	0	0	0	0
Lower Canyon 4	50	2	0	2	64
Lower Canyon 5	50	0	0	0	0
Lower Canyon 6	50	1	0	1	32
Lower Canyon 7	50	6	5	36	1159

There were approximately three age classes of redband trout present in Lower Canyon Creek, with the middle age class making up the bulk of the population. The smallest redband trout sampled was 84 mm in length, with the largest being 210 mm in length. Figure 1 illustrates the length frequency of the redband trout sampled from Lower Canyon Creek.

Lower Canyon 7 had the highest estimated population of redband trout at 36, and an estimated fish per mile of 1,159. Ten brook trout were sampled during the survey and were confined to the uppermost two stations. An estimated population of brook trout could not be made, as the number of brook trout captured during each pass was not recorded by seasonal personnel.

During the survey, fin clips were collected from 14 redband trout. The fin clips need to be analyzed to determine what level of introgression with hatchery origin trout is present in Canyon Creek and the Salmon Falls River drainages redband trout.

Other endemic fish species present included Paiute sculpin, speckled dace, redband shiner, and mountain sucker. Table 4 shows the station locations where each respective species was found.

Figure 1. Length frequency of redband trout from Lower Canyon Creek on September 26, 2017.

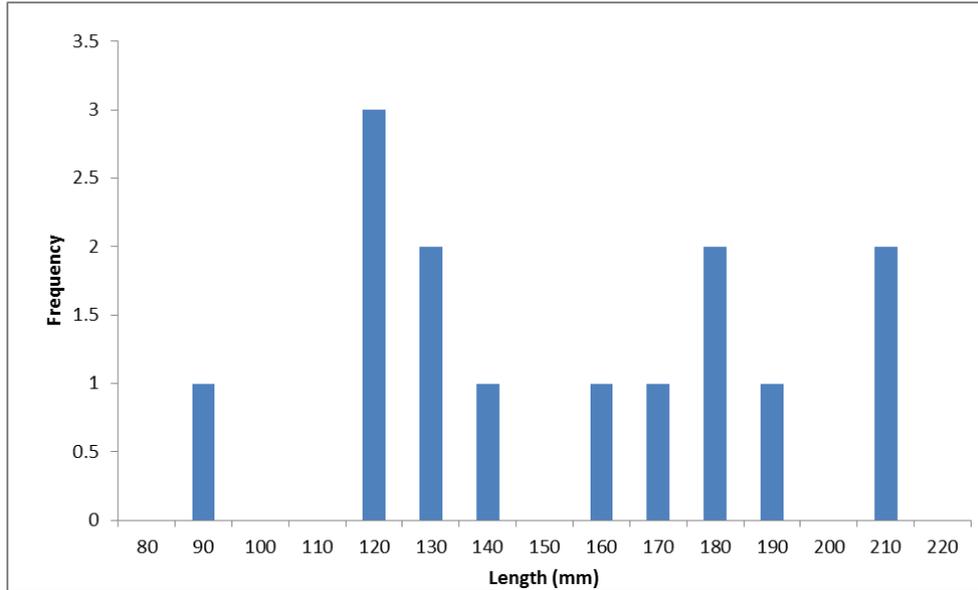


Table 4. Endemic fish species in Lower Canyon Creek, the X signifies the species presence on September 26, 2017

Station	P. Sculpin	S. Dace	Redside Shiner	Mountain Sucker
Lower Canyon 3		X	X	X
Lower Canyon 4		X	X	X
Lower Canyon 5		X	X	
Lower Canyon 6	X	X		
Lower Canyon 7	X			

Overall, the riparian conditions during the survey were noted as being in fair to good condition throughout the drainage. Extensive beaver activity was noted as being present at all stations surveyed, with large amounts of ponding occurring.

Flat and Caudal Creeks

A total of 109 redband trout and 38 brook trout were sampled during the survey. Redband trout were found at five out of six sampling stations, while brook trout were only present at four (Table 5; Map 2). Table 5 shows the results of the survey.

Table 5. Date, UTM, water temperature, and number of redband trout and brook trout present at each station on Flat Creek on September 27, 2017 and November 1, 2017.

Station	Date	# RB Present	#BK Present	UTM E	UTM N	H2O Temp
Flat 1	11/1/2017	9	7	650451	4646400	41
Flat 2	11/1/2017	14	21	651735	4645196	48
Flat 3	11/1/2017	18	10	652515	4644158	48
Flat 4	9/27/2017	34	4	652977	4642682	55
Flat 5	9/27/2017	34	0	653709	4641779	48
Flat 6	9/27/2017	0	0	654647	4641208	43

There were approximately four age classes of redband trout and approximately three to four age classes of brook trout present in Flat Creek, with the younger age classes making up the bulk of the population. The smallest redband trout sampled was 34 mm in length, with the largest being 265 mm in length. The smallest brook trout sampled was 70 mm in length, with the largest being 224 mm in length. Figure 2 illustrates the length frequency of the redband trout sampled from Flat Creek. Figure 3 illustrates the length frequency of the brook trout sampled from Flat Creek

Figure 2. Length frequency of redband trout from Flat Creek on September 27, 2017 and November 1, 2017.

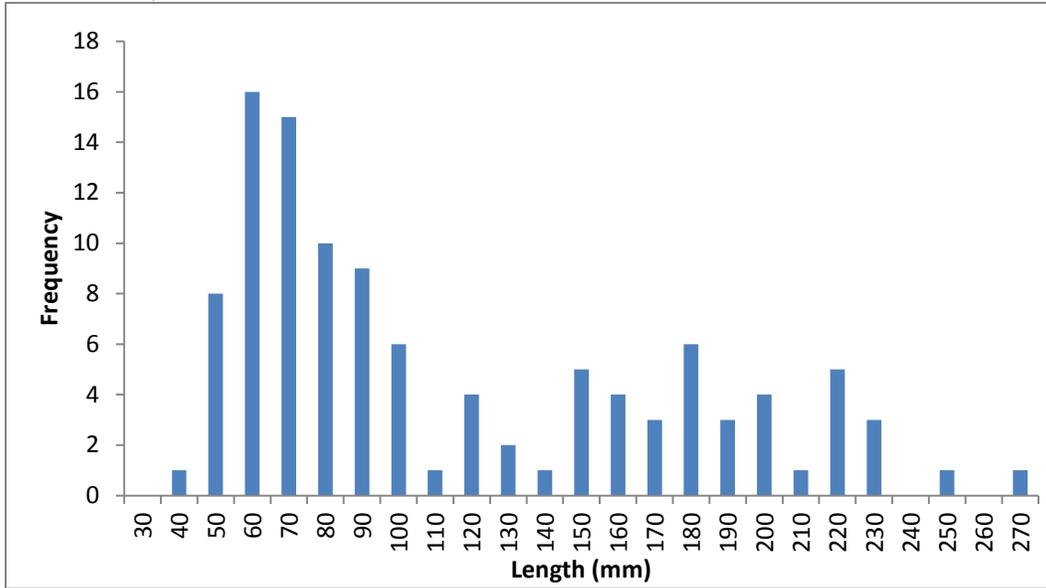
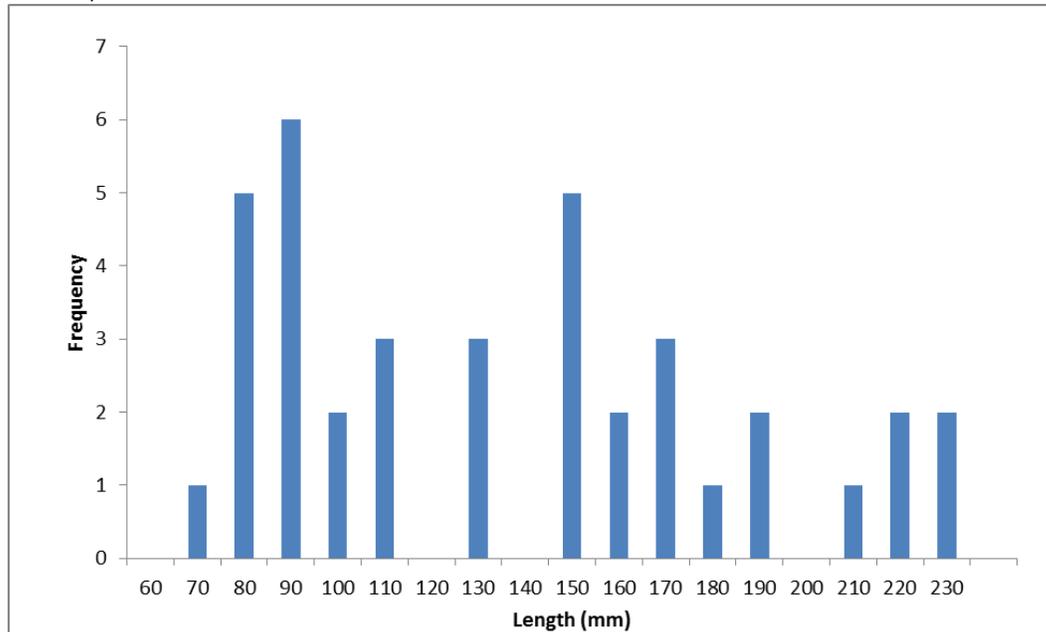


Figure 3. Length frequency of brook trout from Flat Creek on September 27, 2017 and November 1, 2017.



Only a single pass was completed at Flat 6 as no fish were sampled during the first pass. A second pass with depletion was conducted at the remainder of the stations. Table 6 shows the redband trout results of the survey. Table 7 shows the brook trout results from the survey.

Table 6. Station, station length, number of redband trout first pass, number redband trout second pass, station population estimate (N), and estimated fish per mile for Flat Creek on September 27, 2017 and November 1, 2017.

Station	Length (m)	# RB First Pass	# RB Second Pass	N	Fish/Mile
Flat 1	50	7	2	10	316
Flat 2	48	9	5	20	652
Flat 3	50	12	6	24	773
Flat 4	50	28	6	36	1147
Flat 5	50	30	4	35	1114
Flat 6	50	0	0	0	0

Table 7. Station, station length, number of brook trout first pass, number brook trout second pass, station population estimate (N), and estimated fish per mile for Flat Creek on September 27, 2017 and November 1, 2017.

Station	Length (m)	# BK First Pass	# BK Second Pass	N	Fish/Mile
Flat 1	50	6	1	7	232
Flat 2	48	17	4	22	716
Flat 3	50	9	1	10	326
Flat 4	50	0	0	0	0
Flat 5	50	0	0	0	0
Flat 6	50	0	0	0	0

Flat 4 had the highest estimated population of redband trout at 36 and an estimated fish per mile of 1,147. Brook trout were confined to the lowest three stations and generally at lower abundances than redband trout, with the exception of Flat 2. At Flat 2, the estimated population of brook trout was 716 fish per mile, while the estimated population of redband trout was only 652 fish per mile.

During the survey, fin clips were collected from 15 redband trout. The fin clips need to be analyzed to determine what level of introgression (if any) occurs between hatchery origin trout in Flat Creek and the East Fork Bruneau River drainages with redband trout.

Overall, the riparian conditions during the survey were noted as being in fair to good condition throughout the drainage. Evidence of past cattle use was present but not substantial. A very large active beaver complex was present upstream of Flat 2.

Due to time constraints and flow conditions Caudal Creek were not surveyed in 2017.

Silver, Breakneck, Cap Winn, and Frost Creeks

Due to time constraints and flow conditions, Silver, Breakneck, Cap Winn, and Frost creeks were not surveyed in 2017.

Beaver Creek

Due to time constraints and flow conditions, Beaver Creek was not surveyed in 2017.

Cottonwood and Lime Creek

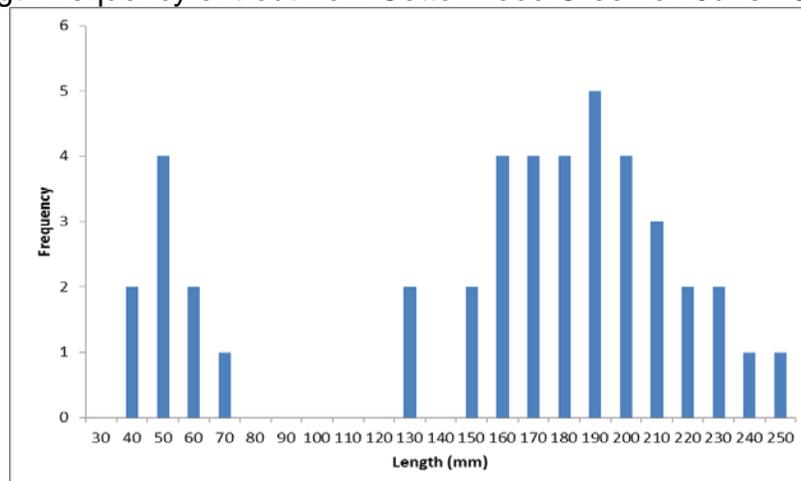
A total of 45 redband trout were sampled during the survey, with trout being found at six of the ten stations sampled (Table 8; Map 3). Table 8 shows the results of the survey.

Table 8. Date, UTM, water temperature, and number of trout present at each station on Cottonwood Creek on June 26 - 29, 2017.

Station	Date	# RB Present	UTM E	UTM N	H2O Temp
Cottonwood 2	6/27/2017	0	687593	4649238	61
Cottonwood 3	6/27/2017	3	686503	4848485	60
Cottonwood 4	6/27/2017	3	685247	4647772	63
Cottonwood 5	6/26/2017	1	683715	4647418	60
Cottonwood 6	6/26/2017	0	682422	4646578	65
Cottonwood 8	6/27/2017	15	681061	4643919	58
Cottonwood 9	6/27/2017	9	680566	4642429	55
Cottonwood 10	6/27/2017	14	679768	4641195	61
Cottonwood 11	6/29/2017	0	679369	4639593	55
Cottonwood 12	6/28/2017	0	678202	4638428	46

There were approximately three age classes of trout present, with two larger age classes making up the bulk of the population. The smallest fish sampled was 31 mm and the largest was 275 mm (Figure 4).

Figure 4. Length frequency of trout from Cottonwood Creek on June 26 - 29, 2017.



Only a single pass electroshocking survey was completed on Cottonwood 2, Cottonwood 6, Cottonwood 11, and Cottonwood 12 due to no trout being sampled on the first pass. A second pass with depletion was conducted at the remainder of the stations. Table 9 shows the results of the survey.

Table 9. Station, station length, number of trout first pass, number trout second pass, station population estimate (N), and estimated fish per mile for Cottonwood Creek on June 26 - 29, 2017.

Station	Length (m)	# First Pass	# Second Pass	N	Fish/Mile
Cottonwood 2	50	0	0	0	0
Cottonwood 3	50	3	0	3	3
Cottonwood 4	50	2	1	4	223
Cottonwood 5	50	1	0	1	1
Cottonwood 6	50	0	0	0	0
Cottonwood 8	50	11	4	17	224
Cottonwood 9	50	6	3	12	386
Cottonwood 10	50	8	6	32	2891
Cottonwood 11	50	0	0	0	0
Cottonwood 12	50	0	0	0	0

Cottonwood 10 had the highest estimated fish per mile at 2,891 (Table 9; Map 3). The average fish per mile estimate for Cottonwood Creek was 373.

During the survey, fin clips were collected from 26 trout. The fin clips need to be analyzed to determine what level of introgression (if any) with hatchery origin and non-native trout is present in Cottonwood Creek. Several of the trout sampled had pronounced cutthroat characteristics (Photo 1). It is possible that the trout currently in Cottonwood Creek are redband trout X cutthroat trout hybrids. Trout was the only species sampled, with no endemic fish species being present.

Photo 1. Possible redband trout X Cutthroat trout hybrid on Cottonwood Creek on June 26, 2017.



Overall, the riparian conditions during the survey were noted as being in good to excellent condition, with the exception of Cottonwood 6, Cottonwood 5, and Cottonwood 4. More extensive cattle use was prevalent at these stations, which was likely contributed to by the proximity to the main road. Although not extensive, it should continue to be monitored to ensure suitable habitat conditions for trout persist.

Due to time constraints and flow conditions, Lime Creek was not surveyed in 2017.

McDonald Creek

A total of 261 redband trout were sampled during the survey, with trout found at all stations and the majority being present at the highest elevation stations (Table 10; Map 4). Table 10 shows the results of the survey.

Table 10. Date, UTM, water temperature, and number of redband trout present at each station on McDonald Creek on August 22 - 24, 2017, September 6, 2017, and October 18 - 19, 2017.

Station	Date	# RB Present	UTM E	UTM N	H2O Temp
McDonald 1	8/22/2017	11	607502	4645359	58
McDonald 2	8/24/2017	4	606731	4644071	57
McDonald 3	9/6/2017	2	605128	4643763	55
McDonald 4	9/6/2017	6	604013	4644562	58
McDonald 5	8/24/2017	7	602829	4643669	60
McDonald 6	8/24/2017	23	602201	4642837	65
McDonald 7	8/24/2017	17	601759	4641730	64
McDonald 8	10/18/2017	23	600994	4640998	47
McDonald 9	10/18/2017	55	600024	4640026	47
McDonald 10	10/19/2017	58	598814	4639313	39
McDonald 11	10/19/2017	32	598556	4638258	41
McDonald 12	10/19/2017	23	598566	4637271	43

There were approximately four age classes of redband trout present in McDonald Creek, with the two smaller age classes making up the bulk of the population. The smallest fish sampled was 36 mm in length, with the largest being 240 mm in length. Figure 5 illustrates the length frequency of the redband trout from McDonald Creek.

Only a single pass was completed on McDonald 1 due to equipment malfunction, a second pass with depletion was performed at the remainder of the stations. Table 11 shows the results of the survey.

Figure 5. Length frequency of redband trout from McDonald Creek on August 22 - 24, 2017, September 6, 2017, and October 18 - 19, 2017.

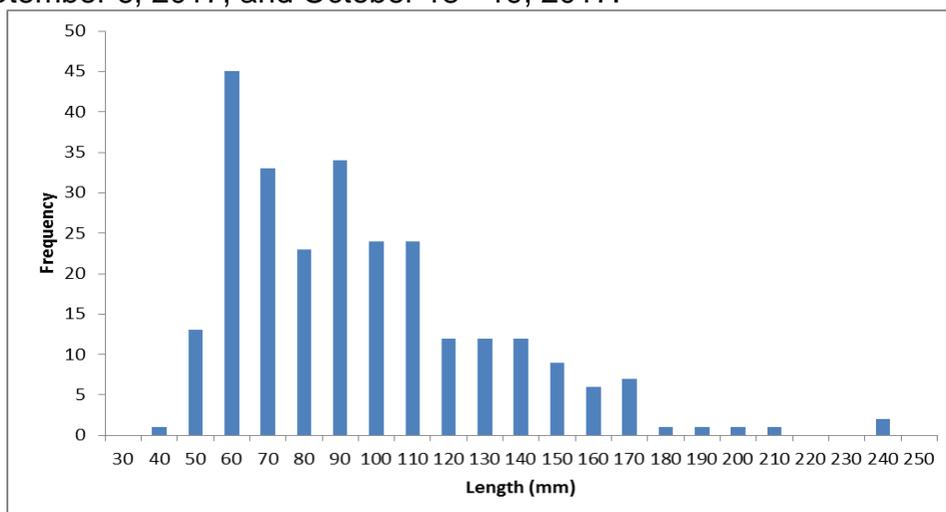


Table 11. Station, station length, number of redband trout first pass, number redband trout second pass, station population estimate (N), and estimated fish per mile for McDonald Creek on August 22 - 24, 2017, September 6, 2017 and October 18 - 19, 2017.

Station	Length (m)	# First Pass	# Second Pass	N	Fish/Mile
McDonald 1	50	11	N/A	N/A	N/A
McDonald 2	50	3	1	5	145
McDonald 3	50	2	0	2	64
McDonald 4	50	5	1	6	201
McDonald 5	50	4	3	16	515
McDonald 6	50	17	6	26	846
McDonald 7	50	9	8	81	2608
McDonald 8	50	18	5	25	802
McDonald 9	50	26	29	N/A	N/A
McDonald 10	50	42	16	68	2184
McDonald 11	50	22	10	40	1299
McDonald 12	50	15	8	32	1035

A population estimate could not be made for McDonald 9. More redband trout were captured on the second pass than the first pass; therefore, an accurate population estimate could not be performed for the station. The average fish per mile estimate for McDonald Creek was 1,123.

During the survey, fin clips were collected from 24 redband trout. The fin clips need to be analyzed to determine what level of introgression (if any) of hatchery origin trout is present in McDonald Creek and the Bruneau River drainage.

Redband trout were the only species sampled, with no endemic fish species being present.

Overall, the riparian conditions during the survey were noted as being in good to excellent condition, with the exception of McDonald 6 and McDonald 7. More extensive cattle use is prevalent at these stations, which is likely contributed to by the proximity to the main road. Although not extensive, it should continue to be monitored to ensure suitable habitat conditions for redband trout persist.

Dolly Creek

Redband trout were sampled during the survey. Table 12 shows the results of the survey.

Table 12. Date, UTM, water temperature, and number of redband trout present at each station on Dolly Creek on August 2-3, 2017.

Station	Date	# RB Present	UTM E	UTM N	H2O Temp
Dolly 1	8/2/2017	0	622730	4607573	51
Dolly 2	8/2/2017	0	622230	4608247	50
Dolly 3	8/2/2017	0	621725	4608633	50
Dolly 4	8/2/2017	0	621062	4608889	51
Dolly 5	8/2/2017	0	619968	4609231	52
Dolly 6	8/3/2017	0	618639	4608914	52
Dolly 7	8/3/2017	0	617073	4609194	Dry
Dolly 8	8/3/2017	0	616193	4609632	Dry
Dolly 9	8/3/2017	0	615439	4610496	Dry
Dolly 10	8/3/2017	0	615147	4610170	Dry

Stations 7 – 10 were dry at the time of survey. The majority of the flow originates from a large spring complex located between stations 6 and 7. Speckled dace and redband shiners are currently present in the Dolly Creek drainage. Table 13 illustrates the stations in which they were present.

Table 13. Endemic fish species in Dolly Creek drainage. The X signifies the species presence on August 2 -3, 2017.

Station	S. Dace	Redside Shiner
Dolly 1	X	X
Dolly 2	X	
Dolly 3		
Dolly 4		
Dolly 5		
Dolly 6		
Dolly 7		
Dolly 8		
Dolly 9		
Dolly 10		

Overall habitat conditions on Dolly Creek were excellent. There is evidence of significant past damage, with recovery currently occurring. The riparian area is primarily composed of sedges, with less amounts of rush present. The willow on the property appears to have been sprayed in past years, but it appeared to be recovering. With the

current management practices in place, Dolly Creek is capable of supporting a trout fishery.

The Cabin Pond and Corona Pond provide the best available reservoir habitat in the drainage. Both appear to be primarily spring fed, with adequate depth to prevent any summer/winter fish kills.

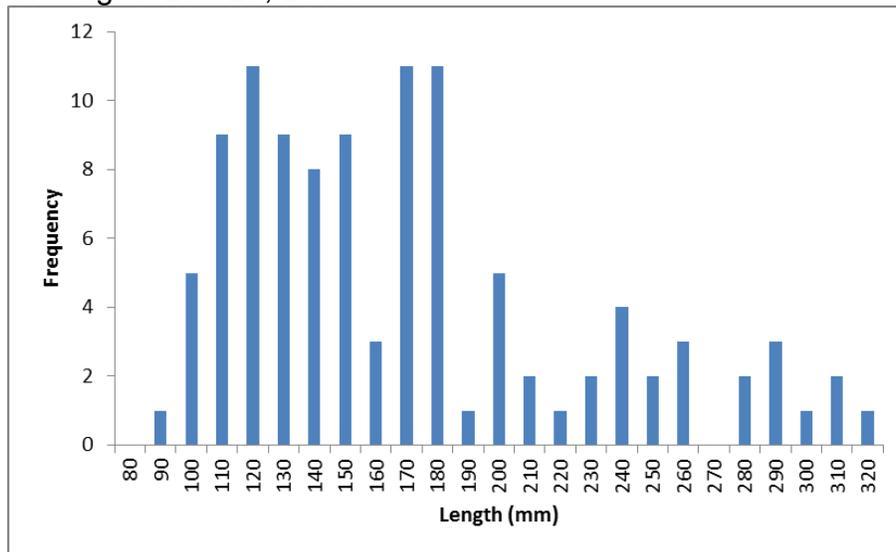
Reintroduction Procedures

Single pass electroshocking was performed on the upper Bruneau River, in what is referred to as the upper canyon near the Deer Creek confluence (Map 6). Any captured redband trout were placed in an aerated tank before being transported to Dolly Creek. Additionally, speckled dace, longnose dace, and mountain sucker, all native species to the Dolly Creek drainage, were moved. Mountain whitefish was present, but was not moved.

Reintroduction Results

A total of 106 redband trout were moved into the Cabin Pond. Figure 6 illustrates the length frequency of the trout moved.

Figure 6. Length frequency of redband trout from the Bruneau River moved into the Cabin Pond on August 28 - 29, 2017.



Approximately four age classes of redband trout were moved, with the two younger age classes constituting the bulk of the population.

Mason Creek Reservoir

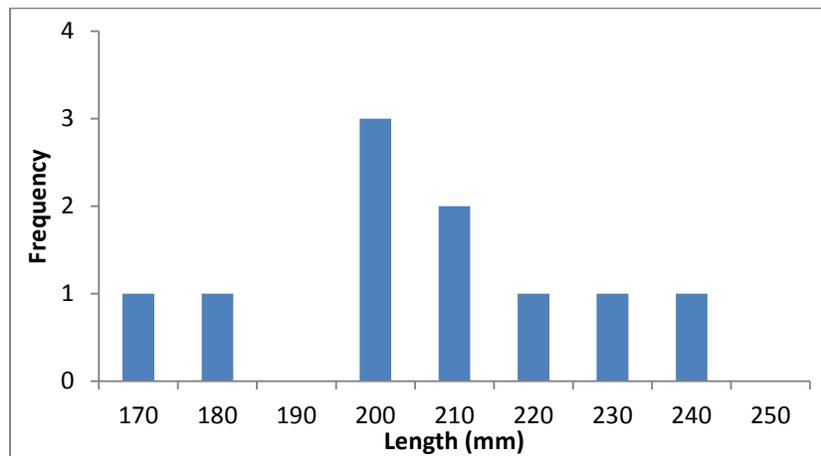
A single experimental gill net was set near the dam (Photo 2) at 3:20 pm on July 5, 2017 and pulled at 10:42 am on July 6, 2017. Once pulled, all redband trout present were measured and checked for body condition before being released.

Photo 2. Gill net placement in Mason Creek Reservoir on July 5, 2017.



A total of ten redband trout were sampled and ranged in length from 172 to 245 mm. Figure 7 illustrates the length frequency distribution of the population sampled. Roughly, two age classes were represented, with the older cohort making up the largest portion of the population.

Figure 7. Length frequency of redband trout from Mason Creek Reservoir on July 7, 2017.



Redband trout appear to be successfully reproducing in Mason Creek, with two age classes currently present. Potential bias may have been introduced due to the mesh size selectivity of the gill net used. Smaller redband trout, less than 150 mm, were not sampled due to the mesh size of the gill net used. Alternative sampling methods such as electroshocking would need to be utilized to incorporate the smaller age classes into the sample.

In future years, if warranted, redband trout from the Bruneau River may be moved into Mason Creek Reservoir to augment the population.

Nevada Department of Wildlife Redband Trout Species Management Plan

The Nevada Department of Wildlife Redband Trout Species Management Plan is currently being revised with the hopes of a draft being available in the fall of 2018. Work will continue until the Species Management Plan is finalized.

MANAGEMENT REVIEW

Northern Nevada experienced well above average stream flows in 2017. A stable population of redband trout was documented in McDonald Creek, with all the available habitat currently being utilized. A stable population of presumptive redband trout (possible hybrids) was documented in Cottonwood Creek, genetic testing needs to be performed to determine what level of introgression (if any) is present.

Smaller but relatively stable populations of redband trout were documented in Lower Canyon and Flat creeks. Brook trout were also present in both locations and interspecific competition with redband trout is a concern. Future removal/eradication efforts of brook trout are warranted.

Due to time constraints, flow conditions, and a significant amount of time spent on other grants, Caudal, Silver, Breakneck, Cap Winn, Frost, Beaver, and Lime creeks were not surveyed in 2017.

The Nevada Department of Wildlife Redband Trout Species Management Plan is currently being revised with the hopes of a draft being available in 2018, in conjunction with The Inland Redband Trout Conservation Agreement with Conservation Strategies that will provide guidance for management of redband trout in Nevada.

Dolly Creek (Bruneau River drainage) was opportunistically surveyed due to the presence of a willing landowner. Redband trout were not present in the drainage and a reintroduction from the Bruneau River occurred. Future reintroductions are warranted to establish a redband trout fishery in both Dolly Creek and the associated reservoirs.

Mason Creek Reservoir was surveyed due to concerns expressed of the private landowner after an unsuccessful fishing trip. A stable redband trout population with several age classes was documented.

Ninety-six redband trout fin clips were collected in 2017. The fin clips need to be analyzed to determine what level of introgression (if any) with hatchery origin trout and cutthroat trout are present in Nevada's redband trout populations.

Future surveys will continue to monitor the status of Nevada's redband trout with concentration on populations that have not been surveyed in recent years.

RECOMMENDATIONS

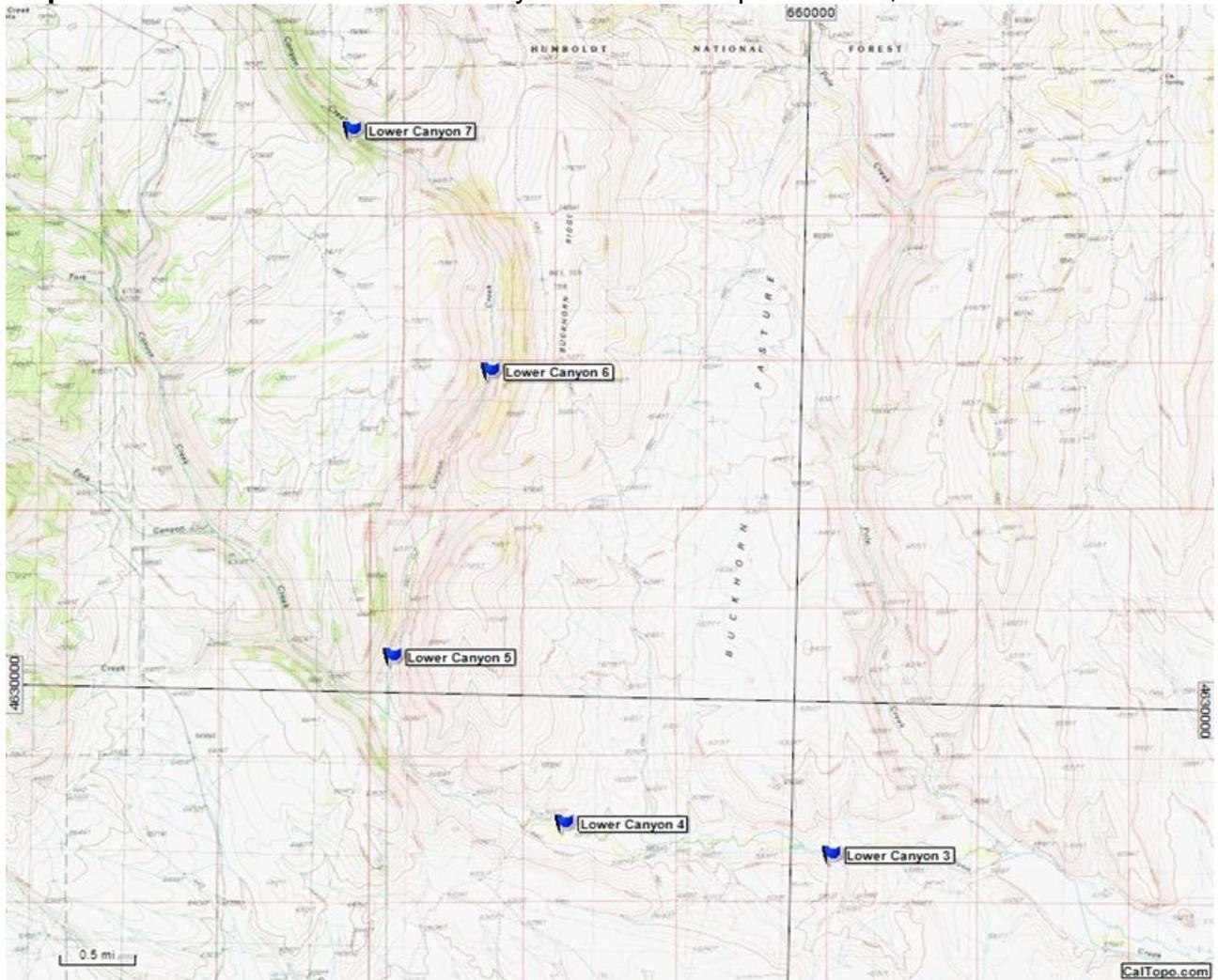
- Continue surveying redband trout streams that have not been surveyed in recent years.
- Finalize the Nevada Department of Wildlife Redband Trout Species Management Plan.

Prepared by: Kevin Netcher
Fisheries Biologist

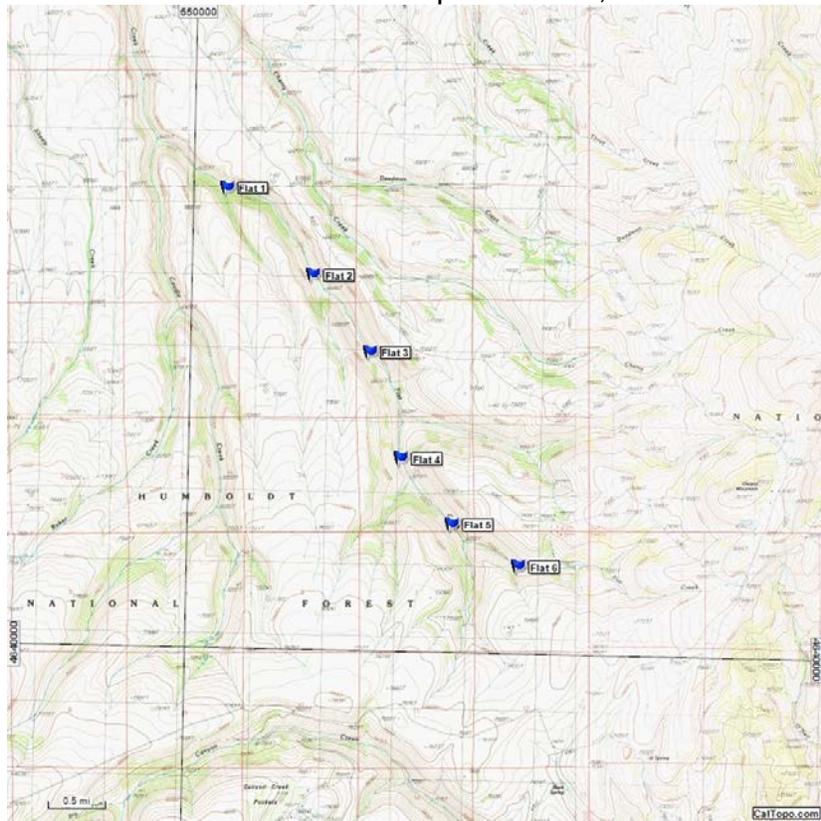
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APPENDICES

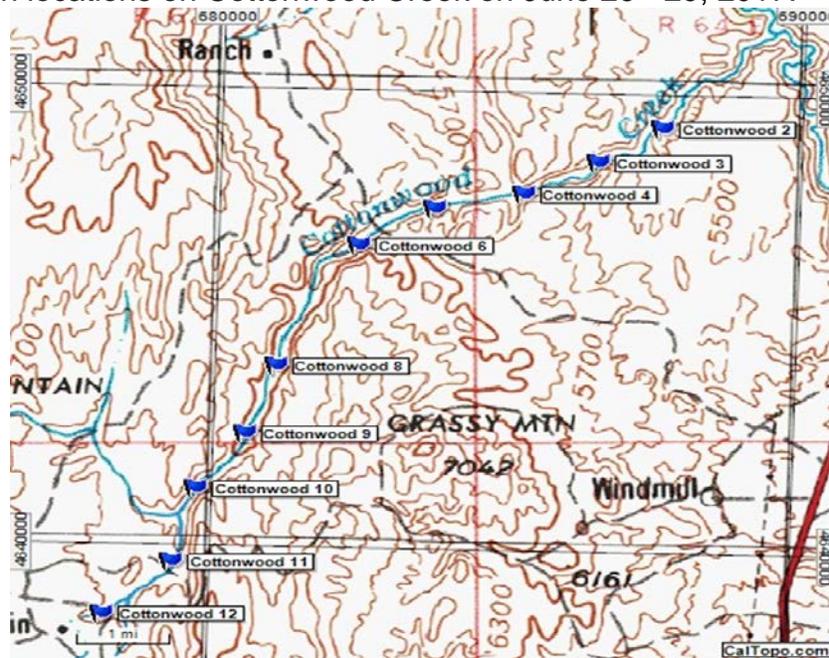
Map 1. Station location on Lower Canyon Creek on September 26, 2017.



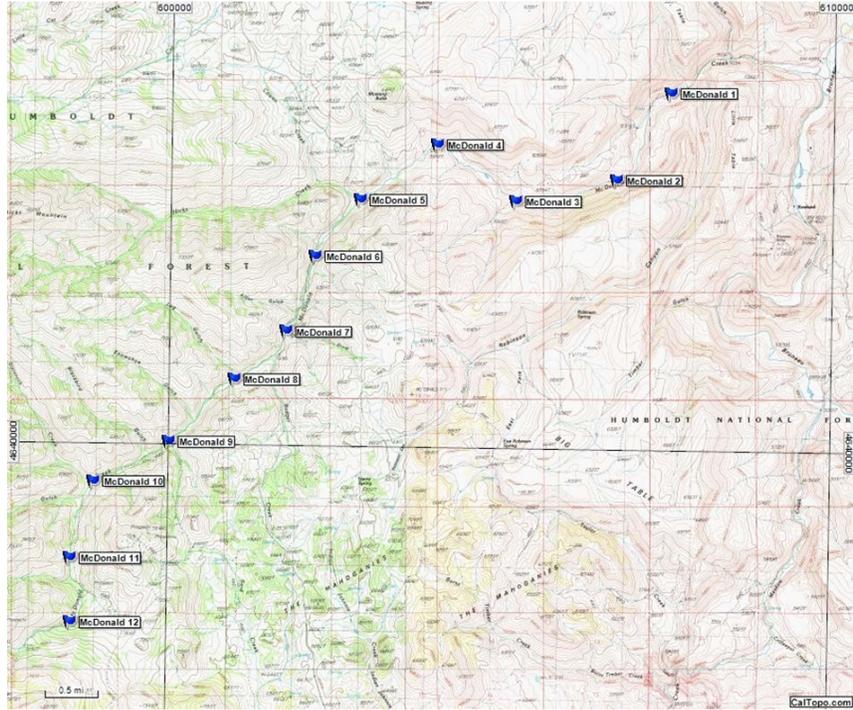
Map 2. Station locations on Flat Creek on September 27, 2017 and November 1, 2017.



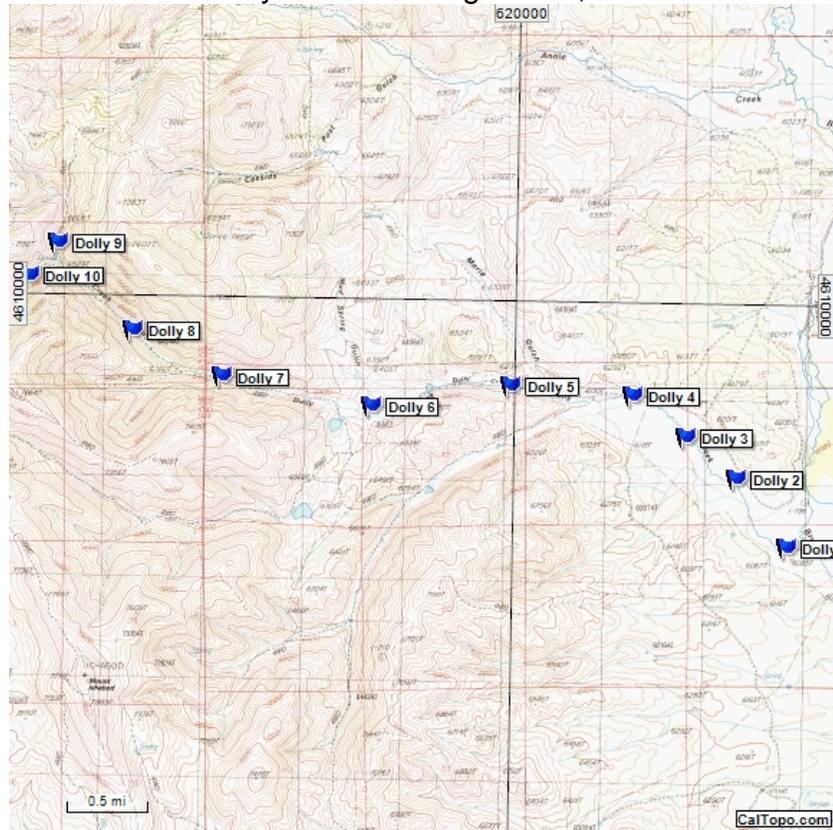
Map 3. Station locations on Cottonwood Creek on June 26 - 29, 2017.



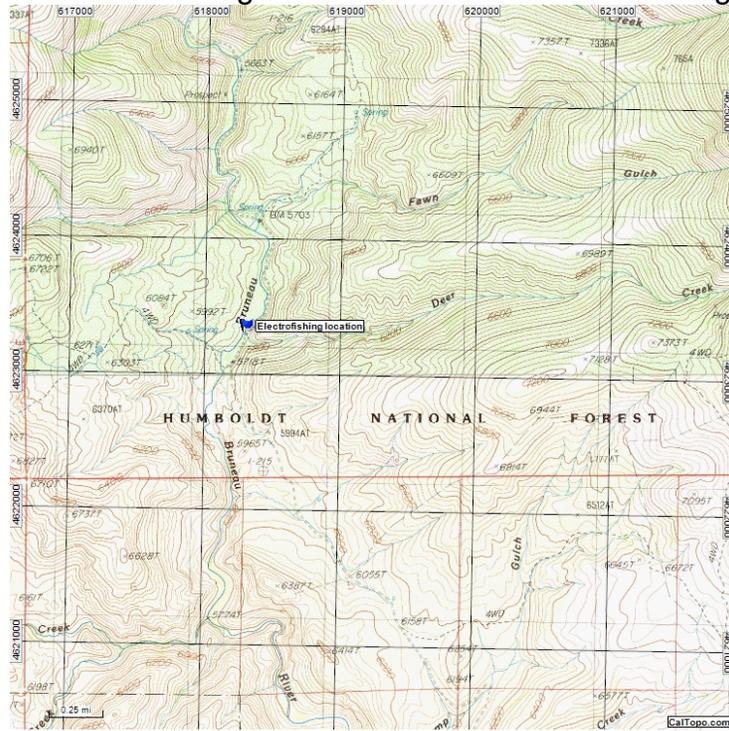
Map 4. Station locations on McDonald Creek on August 22 - 24, 2017, September 6, 2017, and October 18 - 19, 2017.



Map 5. Station locations on Dolly Creek on August 2-3, 2017.



Map 6. Location of electroshocking site on the Bruneau River on August 28 – 29, 2017.



Map 7. Reservoir locations in the Dolly Creek drainage.

