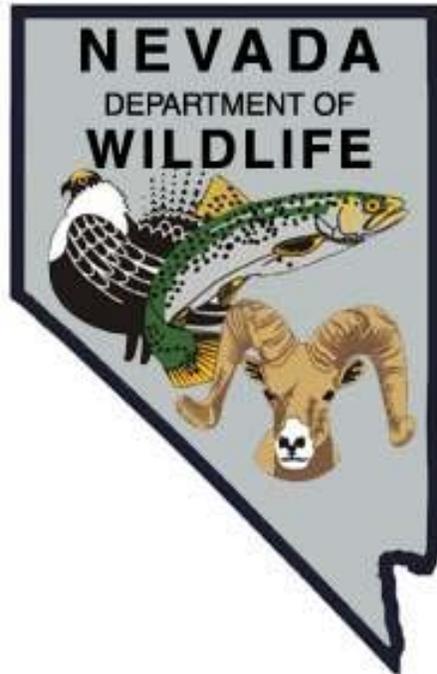


NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORT
F-20-53
2017

EAST WALKER RIVER
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: *East Walker River*
Period Covered: *January 1, 2017 through December 31, 2017*

SUMMARY

This was an extraordinary year for snowpack, precipitation, and subsequent flow in the Walker Basin. During 2017, 212% of average snow-water equivalent was recorded at SNOTEL sites in the Sierra-Nevada. Flow in the East Walker River was well above average all year. Annual discharge was 303,513 acre-feet, which was nearly four times the 12-year average (81,889 acre-feet). During 2016, annual discharge was near average at 63,269 acre-feet. During 2015, comparatively, annual discharge was 23,159 acre-ft, which was the lowest recorded in the past 15 years. The peak flow in 2017 was recorded on June 19 at 1,480 cubic feet per second (cfs), while during 2016, it occurred during mid-May at 274 cfs, and in 2015, it was 135 cfs on June 5, which represented the earliest peak in recent history. Peak flow in 2014 was recorded during mid-July at 92 cfs.

Based on the latest Mail-in Angler Questionnaire Survey conducted from 2016 for the East Walker River, it was estimated that 573 anglers spent 1,427 days to catch 7,568 fish for a catch rate of 13.2 fish per angler-day. During 2015, it was estimated that 461 anglers fished 1,388 days to catch 3,781 fish for a catch rate of 2.27 fish per angler-day.

Along the general-fishery portion (Elbow, Raccoon Beach, Ravenelle, Rafter 7, Flying-M, and Zanis), the impacted by drought and flash flooding from 2014 to 2016 resulted in low trout numbers and a corresponding drop in angling pressure. This, in 2017, was only to be followed up by high flows that made fishing nearly impossible for much of the year. In spite of the very high flows, Rosaschi Ranch angler success was near average at 0.71 and 1.22 fish per hour based on contact angler creel and drop-box survey data, respectively. Anglers caught nice fish at Rosaschi Ranch, with a few greater than 18 in reported from the drop-box survey. Roving creel and angler drop-box data showed brown trout averaged slightly larger than rainbow trout (12.3 inches and 11.2 inches, respectively), which was consistent with historical data.

East Walker River electroshocking survey methods during 2016 and 2017 were consistent with historical methods, however, the methods used during 2014 and 2015 were different and results might not be comparable. The historical trend of an increasing trout population from downstream to upstream was again observed during 2017. Fish abundance throughout the river, though, was estimated to be well below average for a fourth consecutive year. The trout population estimate at Rosaschi Ranch was estimated at 486 trout per mile, compared to the 10-year average at 1,772 trout per

mile, due mostly to low juvenile brown trout abundance ($n=2$). Juvenile brown trout historically make up a large portion of the wild trout density estimates.

Basic stream habitat assessments were conducted for the second year and results were consistent with trout density estimates at typical surveyed locations. The newest location surveyed, Ravenelle, found near the confluence with Rough Creek, showed similar habitat conditions as Rosaschi Ranch. During 2017, wild populations of brown, rainbow, and mountain whitefish were observed at both the Ravenelle and Rosaschi Ranch. Wild brown and rainbow trout were also observed at Raccoon Beach, however, no mountain whitefish were found here.

In 2017, the East Walker River was stocked at the Elbow with 14,423 catchable brown trout averaging 9.7 inches and 3,737 catchable rainbow trout averaging 10.0 inches. Typically, no catchable-sized brown trout are stocked in the East Walker River (fingerlings are stocked annually), however, in 2017, larger brown trout augmented the wild population that was still recovering from the effects of prolonged drought. California Department of Fish and Wildlife typically stocks fingerling brown trout below Bridgeport Reservoir and, during 2016, 16,028 fingerling brown trout averaging 11.4 fish per pound were stocked. NDOW

BACKGROUND

The East Walker River originates along the eastern slope of the Sierra-Nevada in California. Bridgeport Reservoir, CA, located 11.3 km (7.0 mi) upstream from the NV-CA border, supplies irrigation water to farmland in Nevada and has a maximum volume of 40,494 acre-ft. The Walker River Irrigation District (WRID) can divert to storage 39,700 acre-ft per annum (afa) in Bridgeport Reservoir (CA), but can only withdraw 36,000 afa. The irrigation season generally begins April 1 and ends November 1, and summertime flow typically ranges from 200 to 500 cfs below the reservoir.

The California State Water Board maintains a minimum discharge below Bridgeport Reservoir of 20 cfs. When air temperature diminishes below 0°F, minimum discharge increases to 30 cfs. Flows of 30 cfs or above are mandatory from the beginning of November to the end of February in order to reduce anchor ice and to continue providing riffle and pool habitats for trout survival.

Land status adjacent to the East Walker River varies from U.S. Forest Service, Bureau of Land Management, to private property. In 1995, the American Land Conservancy purchased the Rosaschi Ranch, approximately 2.2 to 8.2 river miles below the NV-CA border. This land now is under USFS management, while NDOW manages the fishery as a “quality fishery” having a zero-harvest limit. The Flying-M Ranch historically allowed public access at the Elbow, which is the beginning area of the “general fishery” and anglers can harvest 5 trout and 10 mountain whitefish. The East Walker River flows for about 62 mi in Nevada before it reaches the confluence with the West Walker River in Mason Valley. Prior to 2016, approximately 21 mi or 34% was public; however, through additional cooperation with private landowners, 38% of the

river was accessible to anglers. During 2016, several large private ranches (Rafter 7, Flying M, etc.) were transferred from private ownership to the State of Nevada, Division of State Parks. Approximately 28 river miles that have been closed will become accessible to the public.

OBJECTIVES

- Conduct a general fisheries assessment through opportunistic angler contacts and mail-in, angler questionnaire data.
- Maintain and check for returns of angler drop-box surveys at least once per month.
- Coordinate with land management agencies and private landowners to develop new access and stocking locations where opportunities exist.
- Monitor fish populations along the East Fork during three days of tote-barge electroshocking at five established sites during November.

PROCEDURES

Conduct a general fisheries assessment through opportunistic angler contacts and mail-in angler questionnaire data. Anglers were contacted on seven occasions during 2017, primarily at five locations along the East Walker River: Rosaschi Ranch, the Elbow, Zanis, Raccoon Beach, and Rafter 7. Angler creel information was collected throughout the year and 16 anglers were contacted during the survey. Information obtained from anglers included type of gear used, number and species of fish caught, size of fish caught, location of fish caught, county of residence, and number of hours fished. The Mail-in Angler Questionnaire Survey consisted of surveys mailed at the end of 2016 to anglers acquiring a Nevada fishing license. Data was received and summarized for estimated number of anglers, fish caught, days spent fishing, and catch rates.

Maintain and check for returns of volunteer, angler drop-box surveys at least once per month. Questionnaires from three streamside drop-boxes located along the East Walker River at Rosaschi Ranch not only collected basic creel information, but also collected angler satisfaction ratings (ranked from +2 [highly satisfied] to -2 [dissatisfied]). Data from all drop-boxes was combined. Maintenance of the drop-boxes occurred on seven occasions during 2017.

Coordinate with land management agencies and private landowners to develop new access and stocking locations where opportunities exist. The Walker Basin Conservancy acquired several ranches (Rafter 7, Flying M, etc.) over the past few years. During the fall of 2016, an agreement between the National Fish and Wildlife Foundation (NFWF), the Walker Basin Conservancy, and Nevada Division of State Parks was finalized and approximately 28 miles of river were transferred from private ownership to the State of Nevada to be managed by State Parks. During 2017, NDOW's access to the Rafter 7 and Flying M properties was granted and fish population surveys and inspections of existing roads and stream access were conducted.

Monitor fish populations along the East Fork during three days of tote-barge electroshocking at four established sites during November. All four of the historical transects established along the East Walker River (Rosaschi Ranch, the Elbow, Raccoon Beach, and Zanis) were sampled during 2017. Two additional transects were sampled at the newly acquired State Parks properties (Rafter 7 Ranch and the Ravenelle formerly Flying-M property). A tote barge electroshocker was towed through each transect for one-pass without the use of block nets. Sampling occurred in at least two pools and two riffles per site covering about 0.10 to 0.25 miles of river. Sampling time varied from 9.0 min at Zanis to 37 min at the Ravenelle. All fish captured were measured to the nearest millimeter and released.

A basic stream habitat inventory was also performed at each population survey transect. From data collected during the inventory, a Habitat Condition Index (HCI) score is generated by using six habitat parameters of pool measure, pool structure, stream bottom, bank cover, bank soil stability, and bank vegetation stability. HCI's of less than 100% reflect certain degrees of habitat improvements that can occur in a stream. The six parameters can be used as indicators in determining which specific areas would be of greatest benefit for improving a stream or stream reach.

FINDINGS

Conduct a general fisheries assessment through opportunistic angler contacts and mail-in angler questionnaire data. Angler contacts were made on seven occasions during 2017 and anglers fishing the East Walker River had an average catch rate of 0.71 fish per hour which was near the 20-year average of 0.80 (Table 1). Eleven angler contacts were made at Rosaschi Ranch where anglers fished 44 hrs to catch 26 fish for a catch rate 0.59 fish per hour. The size of brown trout ranged from 8.0 to 16.0 in and averaged 11.6 in. Rainbow trout ranged from 8.0 to 18.0 in and averaged 11.0 in.

The Rosaschi Ranch is managed under a Coldwater, Trophy Fishery Management Concept, which states, "A trophy fishery provides a significant portion of the harvest as fish of a size most anglers remember catching, while a trophy fish is one of a size worthy of acknowledgment. Sustained carryover of fish from one season to another for a significant portion of the population and exceptional fish growth potential are generally characteristics of a trophy fishery...Minimum size for trout (rainbow, brown, and cutthroat) should be 16.0 inches or approximately five pounds in weight. Angler success rates should range between 0.5 and 1.7 fish per hour and 0 and 1.0 fish per angler day." Catch rates derived from creel survey data collected during 2017 found that Rosaschi Ranch met the objectives for a trophy fishery during 2017. The average size of trout was just below a trophy fishery standard (based on contact surveys); however, several large brown trout (greater than 18 in) were reported by anglers in the drop-box and caught during the electroshocking survey.

Table 1. East Walker River Creel Survey (All Survey Sites Combined).

	2012	2013	2014	2015	2016	2017	Hist. Ave.
No. Days Surveyed	8	10	10	7	6	7	9
No. Anglers Checked	25	9	22	15	15	16	43
Total Angler Hours	105	23	85	54	52	58	129
No. Trout Caught	88	35	75	49	23	41	95
Rainbow	58	26	26	22	12	30	73
Avg. Size mm (in)	256 (10.1)	358 (14.1)	317 (12.5)	355 (14.0)	264 (10.4)	286 (11.2)	284 (11.2)
Brown	30	9	49	30	11	11	20
Avg. Size mm (in)	342 (13.5)	366 (14.4)	345 (13.6)	274 (10.8)	289 (11.4)	320 (12.6)	313 (12.3)
Avg. Fish per Hour	0.84	1.52	0.88	0.91	0.44	0.71	0.8
Avg. Fish per Angler	3.52	3.89	3.41	3.27	1.53	2.56	2.4

The East Walker River downstream of Rosaschi Ranch is managed under a Coldwater, General Fishery Management Concept. This concept states, “Less than 30% of the annual stocking would be carried through from one fishing season to the next and the fish generally show minimal growth from stocked size. Angler success rates should range between 0.25 and 0.75 fish per angler hour and 1.00 and 2.00 fish per angler day.” Four anglers were contacted at the Elbow and one at the Ravenelle and ten fish were caught after an average of fishing for three hours. Rainbow trout averaged 10 in, which was expected from a hatchery supported trout fishery.

The annual mail-in, angler questionnaire data for the East Walker River from 2008 through 2016 is summarized in Table 2. Estimates from 2016 were well below average, with the exception of an above average catch rate.

Table 2. Mail-in, Angler Questionnaire Data, 2008 to 2016.

	2008	2009	2010	2011	2012	2013	2014	2015	2016	Ave
Number of Anglers	1,618	3,096	2,030	1,905	2,488	1,364	1,471	461	573	1,667
No. Angler Days	7,060	10,137	8,228	6,118	9,150	4,232	4,620	1,388	1,427	5,818
Total Fish Caught	25,186	54,005	42,889	34,179	39,139	21,686	15,640	3,781	7,568	27,119
Fish per Angler Day	3.57	5.33	5.21	5.59	4.28	5.12	3.39	2.72	13.20	5.38

Maintain and check for returns of angler drop-box surveys at least once per month. Volunteer, angler drop-box questionnaires collected at Rosaschi Ranch from 2009 through 2017 are summarized in Table 3. The number of anglers participating during 2017 was below average, most likely due to construction of the parking lot where the most popular fishing access was located and the extremely high flows that occurred throughout the year making angling difficult. Angler catch rates in 2017 and historically met the objectives of a coldwater trophy fishery. Angler satisfaction was below average for all categories in 2017, but had increased from 2016 for “overall experience” and “number of fish” (Table 4). Low satisfaction levels could have possibly been related to the catch of stocked rainbow trout. Even though rainbow trout are not stocked in the Rosaschi Ranch section, they move into unoccupied habitat, which traditionally supports a larger wild population and is still rebounding from a prolonged drought.

Table 3. Rosaschi Ranch Drop-Box Survey Results, 2009 to 2017.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	AVE
No. Anglers	50	34	26	37	65	62	30	38	9	39
Hrs Fished	203	139.5	131	195	289.5	304	160	172	34.5	181
Rainbow	120	142	76	190	319	113	43	95	28	125
Brown	80	63	53	164	185	139	58	55	14	90
Whitefish	5	7	7	18	16	19	7	4	0	9
Fish/Hour	1.01	1.52	1.04	1.91	1.80	0.89	0.68	0.90	1.22	1
Fish/Day	4.10	6.24	5.23	10.05	8.00	4.37	3.60	4.05	4.67	6

Table 4. Rosaschi Ranch Drop-Box Satisfaction Survey, 2008 to 2017.

	Overall Experience	Size of Fish	Number of Fish
2008	1.03	0.61	0.59
2009	0.91	0.81	0.56
2010	1.46	1.20	1.00
2011	1.42	1.12	0.88
2012	1.12	1.19	0.73
2013	1.06	0.75	0.87
2014	0.91	0.58	0.40
2015	0.46	0.22	-0.35
2016	0.49	0.37	0.10
2017	0.78	0.22	0.33
AVE	0.96	0.71	0.51

The 12-year average size of fish recorded from angler drop-box surveys is represented in Figure 1. It is likely that the very low number of fish reported in 2017 is a reflection of minimal angler participation as well as fish populations still recovering from prolonged drought. Even though total number of fish reported was low, all size categories were represented, suggesting that at least a small portion of the wild population was able to survive the drought.

Based on the 2017 drop-box data, most fish were caught during September and October (62% of fish reported) when flood-level flows began receding (see Figure 2). These flows were not representative of a typical year; but historically, most fish were caught during the fall when flows generally receded (based on angler use, optimal angling flows are typically when discharge is 4,000-6,000 acre-ft per month or averages 80 to 140 cfs on a daily basis). Catch rates, number of fish caught, and discharge rebounded slightly during 2016 and 2017 (however, discharge during 2017 was much higher) and anglers reported an increase in satisfaction from the lowest recorded rates in 2015 (Table 4). Angler drop-box data and mail in angler questionnaire data from 2006 through 2017 suggest that Rosaschi Ranch has met NDOW objectives of a coldwater trophy fishery.

Figure 1. Angler Drop-Box Fish Size, 2017 vs the 12 yr Average.

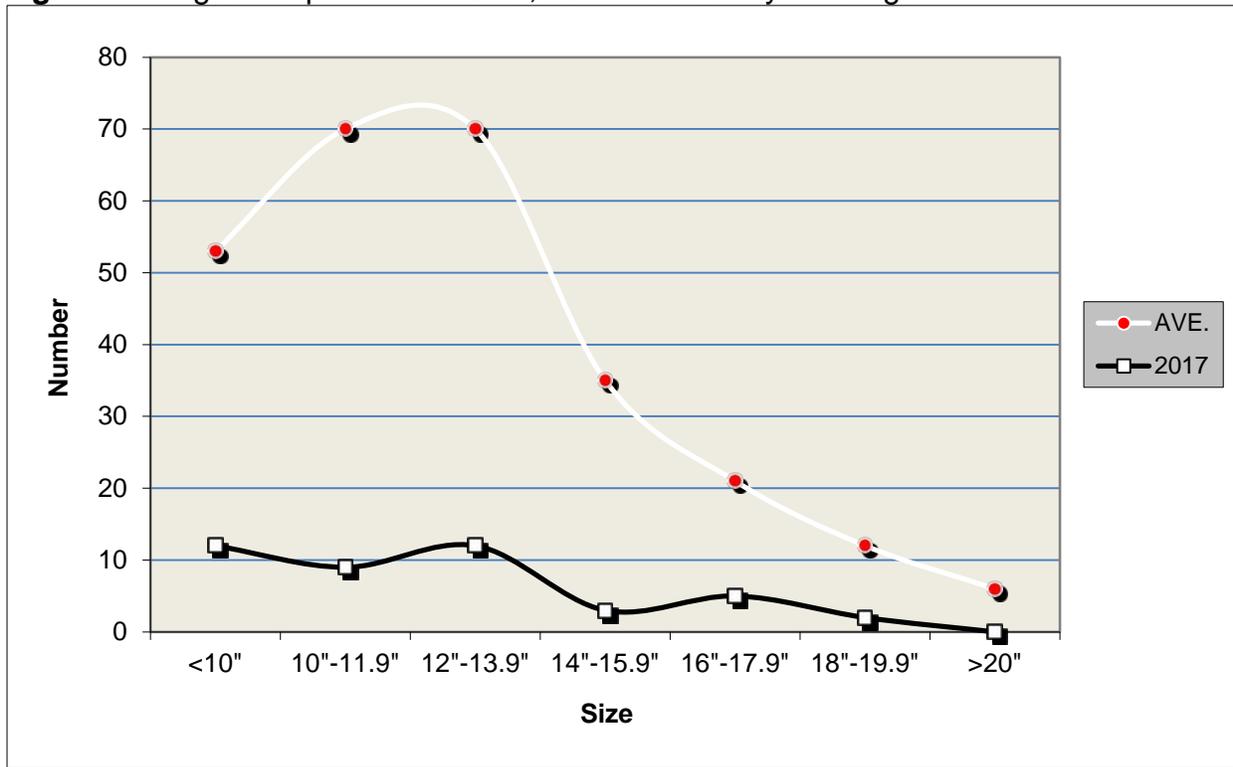
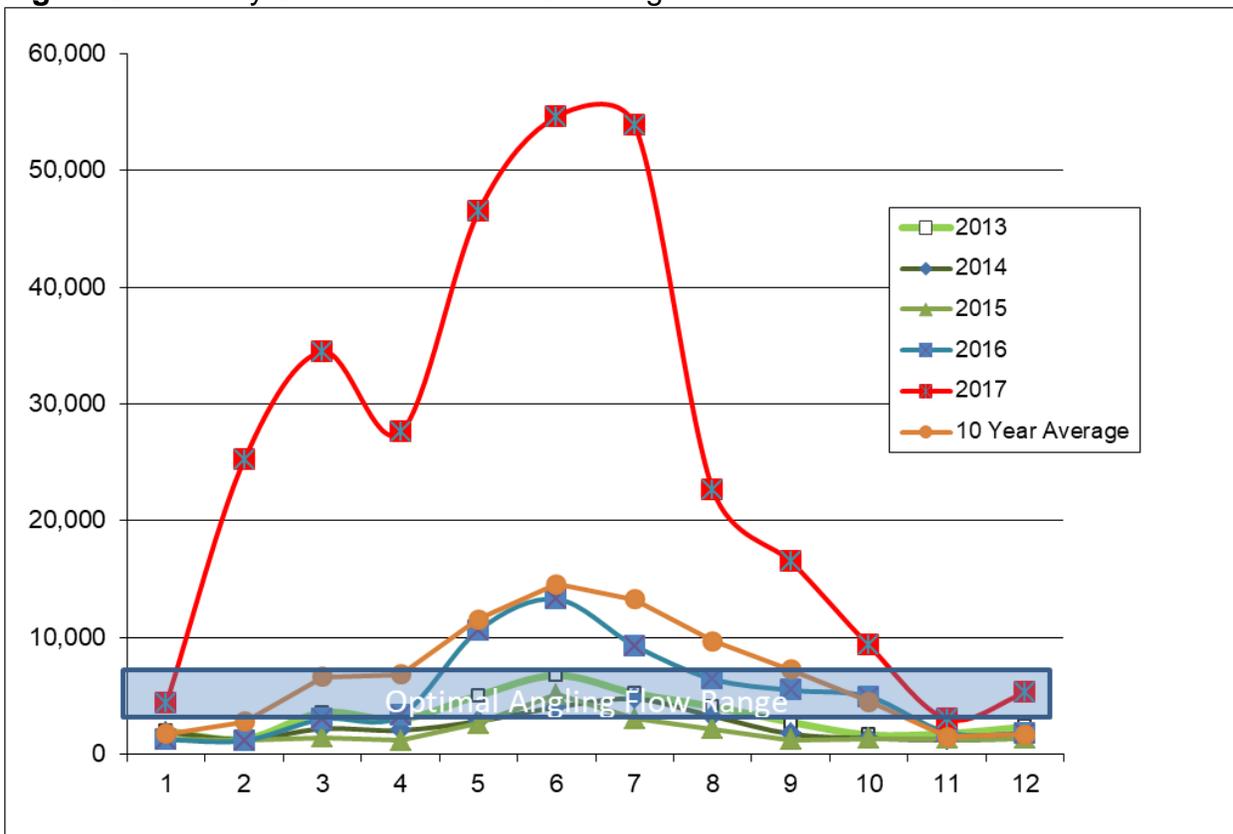


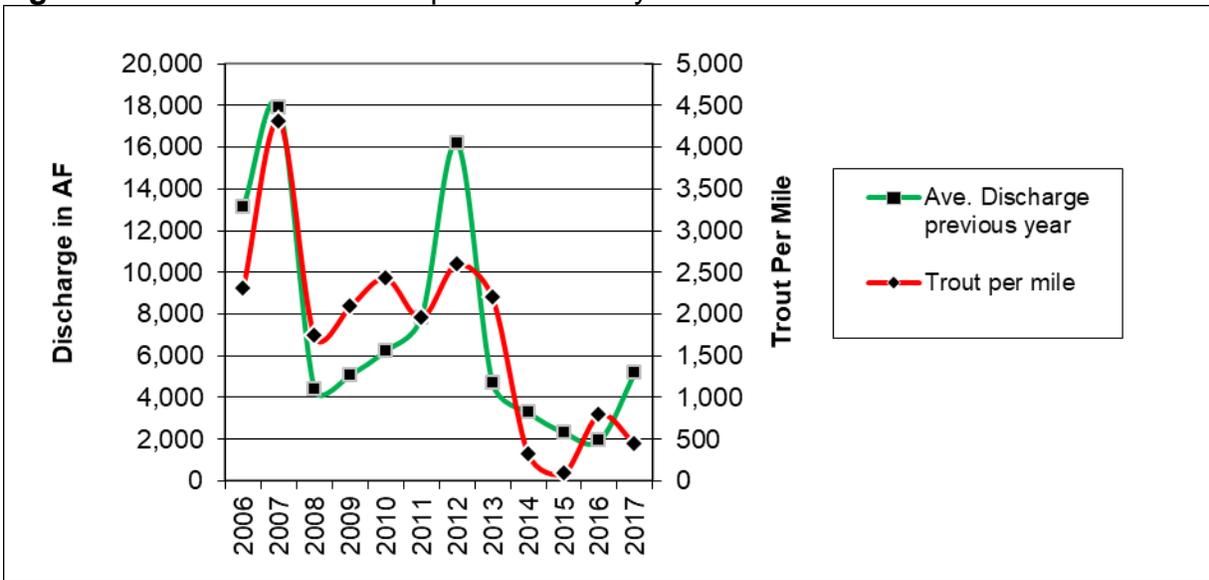
Figure 2. Monthly East Walker River Discharge in Acre-Feet.



Coordinate with land management agencies and private landowners to develop new access and stocking locations where opportunities exist. During 2017, access to the Rafter 7 and Flying M properties was granted and a population survey and inspection of accessibility to the river were conducted. Several areas were identified as potential stocking locations; hatchery personnel verified some of the locations as suitable (Rafter 7, Flying M main ranch), but other areas had accessibility issues for stocking trucks (the Ravenelle). Rafter 7 and Flying M also showed potential to provide additional recreation in areas where access was previously limited by private ownership. Habitat monitoring will occur to assess the river’s potential to hold trout and provide angling in these areas.

Monitor fish populations along the East Fork during three days of tote-barge electroshocking at four established sites during November. Historical electroshocking surveys at Rosaschi Ranch show fish populations fluctuated annually (Figure 3). During 2016, an increase in trout density was observed for the first time since 2012, however, during 2017, flows were too high to use the tote barge during November so surveys were delayed until December. Very few juvenile trout were found at Rosaschi Ranch in 2017 and it is speculated they were not able to remain upstream during extremely high flows observed throughout much of the year (Figure 2). On the other hand, an above average number of adult trout were observed at Rosaschi Ranch during 2017 suggesting that the older, larger fish were able to combat the high flows. The adult population appears healthy.

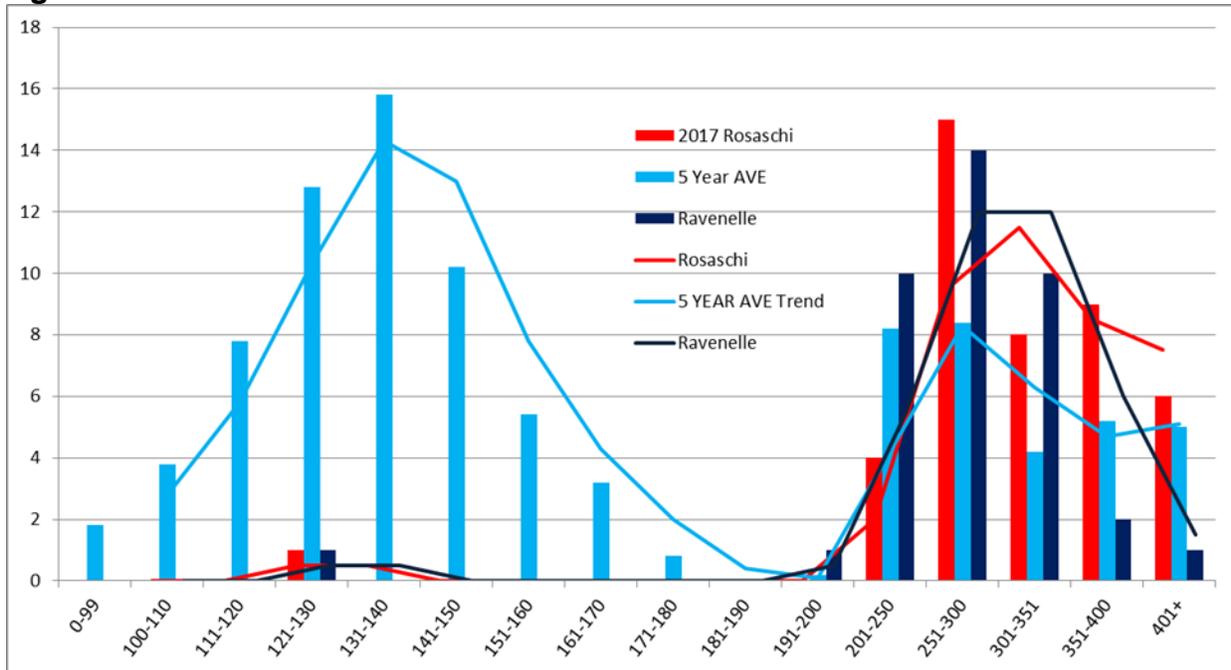
Figure 3. Rosaschi Ranch Population Survey.



The electroshocking survey at the Ravenelle shows the wild fish population size structure may be similar to Rosaschi Ranch (Figure 4). This is somewhat difficult to determine due to flood conditions experienced and 2017 being the first year it was surveyed at the Ravenelle. Habitat surveys indicate that quality trout habitat at the Ravenelle is better than what was observed at the Elbow, but not as high as observed at Rosaschi. Only one brown trout over 400 mm was observed at the Ravenelle, one

was observed at the Elbow, and six at Rosaschi. The density was estimated to be 438 trout per mile at Rosaschi and 336 at the Ravenelle.

Figure 4. Rosaschi and Ravenelle Brown Trout Size Classes.



Zanis was also surveyed during 2017; however, river habitat conditions have been permanently changed due to flash flooding events that occurred in 2015. Zanis was not surveyed in 2016 due to river conditions (extreme sedimentation and large angular boulders that made toting the electroshocking barge difficult). No fish were found at Zanis during the 2017 survey.

Estimated trout abundance typically increases from downstream to upstream and, during 2017, no trout were found downstream of Raccoon Beach (Rafter 7 and Zanis). Raccoon Beach was estimated at 50 trout per mile, the Ravenelle at 336 trout per mile, and Rosaschi Ranch was estimated at 438 trout per mile. Trout density at the Elbow included a large majority of hatchery fish (greater than 75% of all trout caught were hatchery rainbow and brown trout) from recent stocking events, therefore, the estimate was not indicative of a wild population.

Brown trout age classes were divided into two major groups; adult and juvenile (Figure 4). During 2017, only two juvenile brown trout were found, one at Rosaschi Ranch and one at the Ravenelle. Typically, the majority of juvenile brown trout range from 5.2 to 6.3 in (131 to 160 mm) and only a few are found as small as 4.0 in (100 mm) to as large as 6.8 in (175 mm). This size range suggests there is a long spawning season or there can be large differences between the sizes of stocked hatchery trout by CDFW and wild-spawned trout. A long spawning period may contribute to the overall success given temporal changes in water conditions. Based on past data (2015-16), low flows result in limited available spawning habitat and any juvenile production is likely

susceptible to predation by adult brown trout over 16 in (400 mm). Typical fall flow regimes for the East Walker River are detrimental for brown trout reproduction due to the dramatic drop in flow during egg deposition and fry development. It is likely that flood conditions experienced during 2017 were detrimental to fry survival. However, additional spawning gravels may be exposed, as sand/silt is moved downstream helping to increase wild trout production in 2018.

Habitat conditions appeared to be recovering from the flash flood event from 2015 that brought an enormous amount of sediment into the river. In 2017, increased gravel and boulders were observed in areas that in 2015 were covered with sand and silt. Native non-gamefishes as well as carry over brown and rainbow trout were found during sampling at the Elbow, Ravenelle, and Raccoon beach. The 2017 flood appeared to clean the stream bottom that likely helped improve the fisheries.

NDOW and CDFW fish stocking history since 2011 are shown in Table 5. The 2017 stocking report from CDFW has not yet been received. Future stocking plans by both California and Nevada were shared between the respective agencies. Stocking continues to provide additional angling opportunity for the lower sections of the East Walker River (see 2017 stocking for NDOW in Table 6).

Table 5. Walker River Stocking History.

		East Fork			West Fork (NDOW only)		
			Number	Size (in)		Number	Size (in)
2016	NDOW	Brown	-		Brown	-	
		Rainbow	8,224	9.6	Rainbow	14,797	9.3
	CDFW	Brown	16,028	3			
2015	NDOW	Brown	-		Brown	-	
		Rainbow	8,710	8.4	Rainbow	7,265	8.5
	CDFW	Brown	3,000	9.8			
2014	NDOW	Brown	-		Brown	6,199	8.2
		Rainbow	11,835	9.3	Rainbow	10,421	9.6
2013	NDOW	Brown	14,756	2.4	Brown	7,845	3
		Rainbow	12,026	10	Rainbow	21,229	9.8
	CDFW	Brown	100,188	3.28			
2012	NDOW	Brown	11,504	2.4	Brown	10,382	1.9
		Rainbow	11,136	11.5	Rainbow	10,978	10.2
		Brown	200	7.0			
	CDFW	Brown	100,036	3.4			
2011	NDOW	Brown	16,116	3.3	Brown	9,943	2.6
		Rainbow	7,968	10.1	Rainbow	10,484	9.9
	CDFW	Brown	106,720	2.31			

Table 6. Walker River Stocking Summary, 2017.

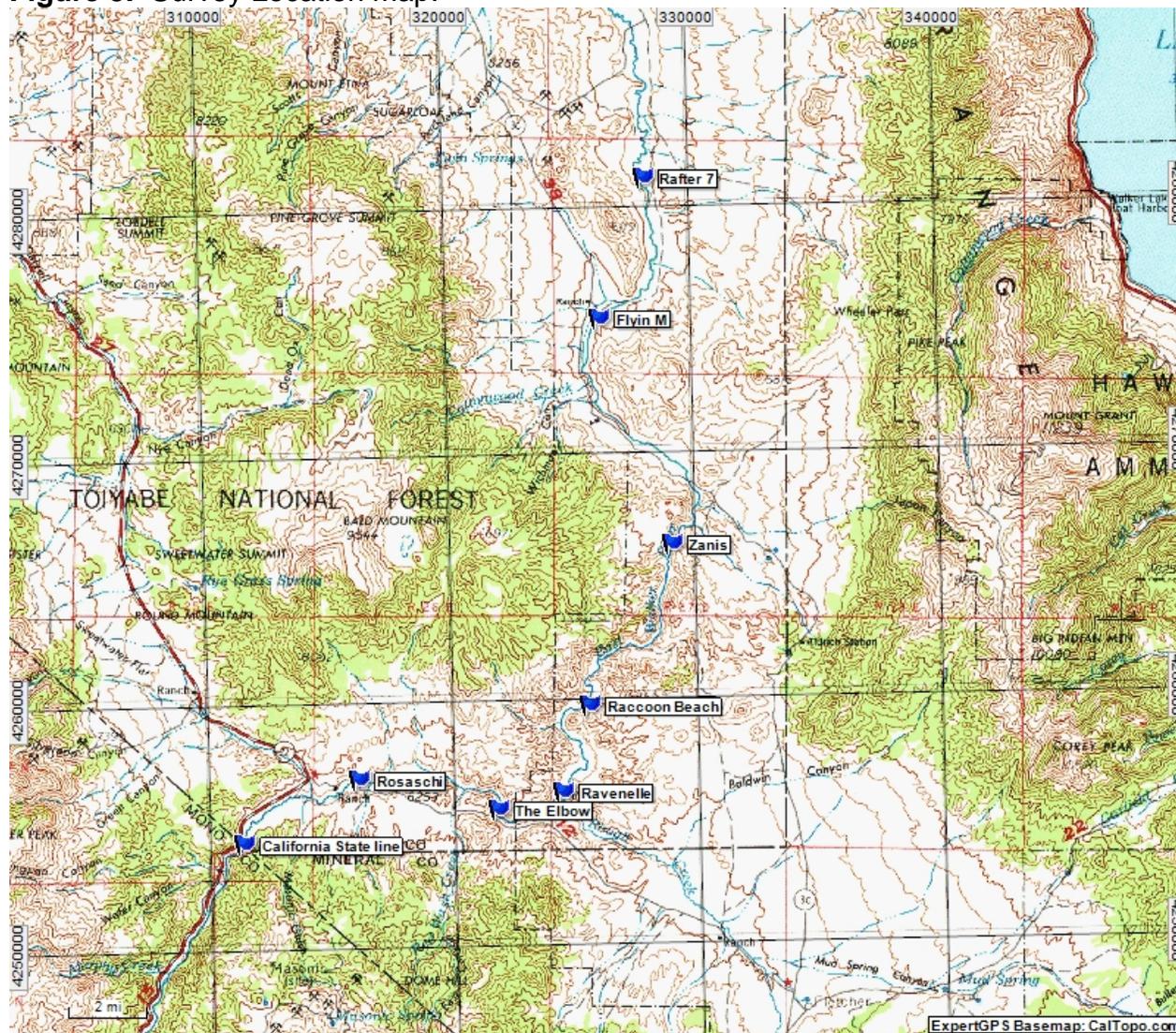
East Fork	Date	Species	Strain	Number	Size
	5/10/2017	Brown	Sheep Creek	2,006	9.5
	5/15/2017	Brown	Sheep Creek	2,783	10.0
	5/31/2017	Brown	Sheep Creek	4017	9.7
	7/20/2017	Brown	Sheep Creek	5,617	9.7
	4/24/2017	Rainbow	Eagle lake	2,009	10.1
	9/7/2017	Rainbow	Erwin/Arlee	1,728	9.9
			Brown Total	14,423	9.7
			Ranibow Total	3,737	10.0
West Fork	Date	Species	Strain	Number	Size
	9/6/2017	Rainbow	Erwin/Arlee	2,048	9.9
	10/4/2017	Rainbow	Kamloop	2,219	9.2
	11/27/2017	Rainbow	Tahoe	1,026	9.5
	10/25/2017	Rainbow	Tahoe	1,507	9.7
			Rainbow Total	6,800	9.6

No stocking occurs in the Rosaschi Ranch trophy fish section. Fingerling brown trout are stocked (when fish are available) at the Elbow (NDOW) and upstream in California (CDFW, Table 5) to help support the brown trout population. Catchable brown trout were stocked in 2017 to augment the wild population following drought conditions experienced over the past several years. Historically, fingerling brown trout, as well as rainbow trout and mountain whitefish, have been able to move freely from the Elbow upstream to Rosaschi Ranch. However, beaver activity observed during the low flows of 2015 may have limited upstream movement. Coordination occurred with the Walker River Irrigation District regarding removal of these dams in 2016. Typically, high flows during the spring and summer limit the beaver's ability to dam across the entire channel; however, flows during the four-year drought were very low and beavers had taken advantage of the condition. During 2017, no beaver dams survived the heavy flows.

Concurrent to population surveys, a basic stream habitat inventory was taken at five locations (Rafter 7, Rosaschi, the Elbow, the Ravenelle, and Raccoon Beach) (Figure 5). A Habitat Condition Index (HCI) score was generated by using six habitat parameters of pool measure, pool structure, stream bottom, bank cover, bank soil stability, and bank vegetation stability. HCI's are a representation of trout habitat quality, and scores of less than 100% can reflect a certain degree of stream improvement or potential to increase the habitat condition. HCI scores for the East Walker River showed a trend from high quality habitat at Rosaschi Ranch (the uppermost transect) to lower quality habitat at Rafter 7 (the furthest downstream transect), with a slight exception between the Elbow and Ravenelle (Figures 6 through 8). The Ravenelle showed a slightly better trout habitat than the Elbow located 2.6 miles upstream. High flows during 2017, due to a higher than average snowpack, likely reduced the embeddedness that was observed during 2015 and 2016. The highest quality habitat was observed at Rosaschi Ranch, which was consistent with fish population sampling results. Stream habitat inventories were also conducted at the

Elbow and Raccoon Beach during 2016 and 2017 and were used as baselines. The 2017 data verified that the river habitat is improving.

Figure 5. Survey Location map.



MANAGEMENT REVIEW

The primary work program objectives for the East Walker River were completed in 2017. The data suggest that the East Walker River is meeting the goals and objectives for a coldwater general fishery and a coldwater trophy fishery. Current regulations for both the general fishery and trophy fishery are adequate and should remain unchanged.

Figure 6. Habitat Condition Index Scores.

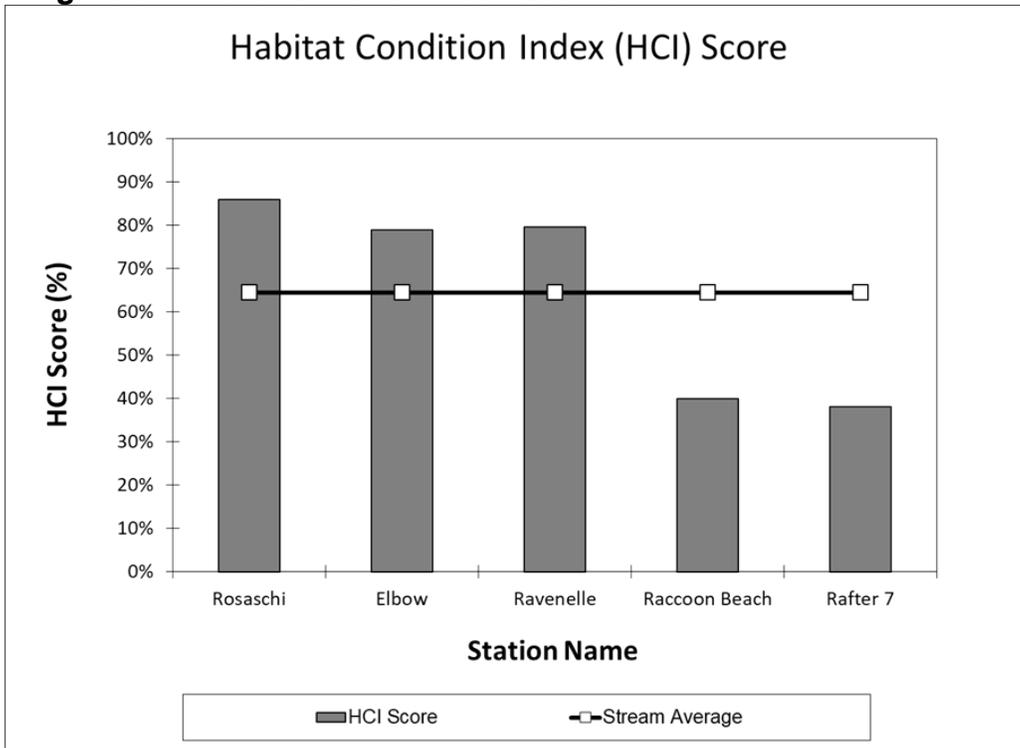


Figure 7. Pool Measure (percent).

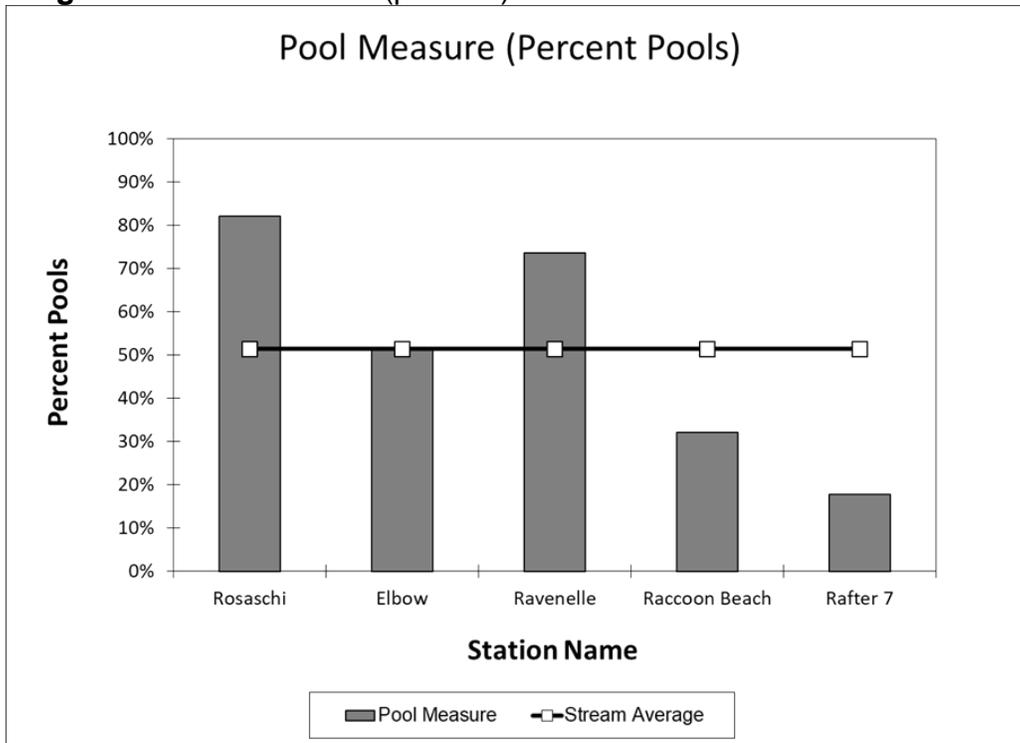
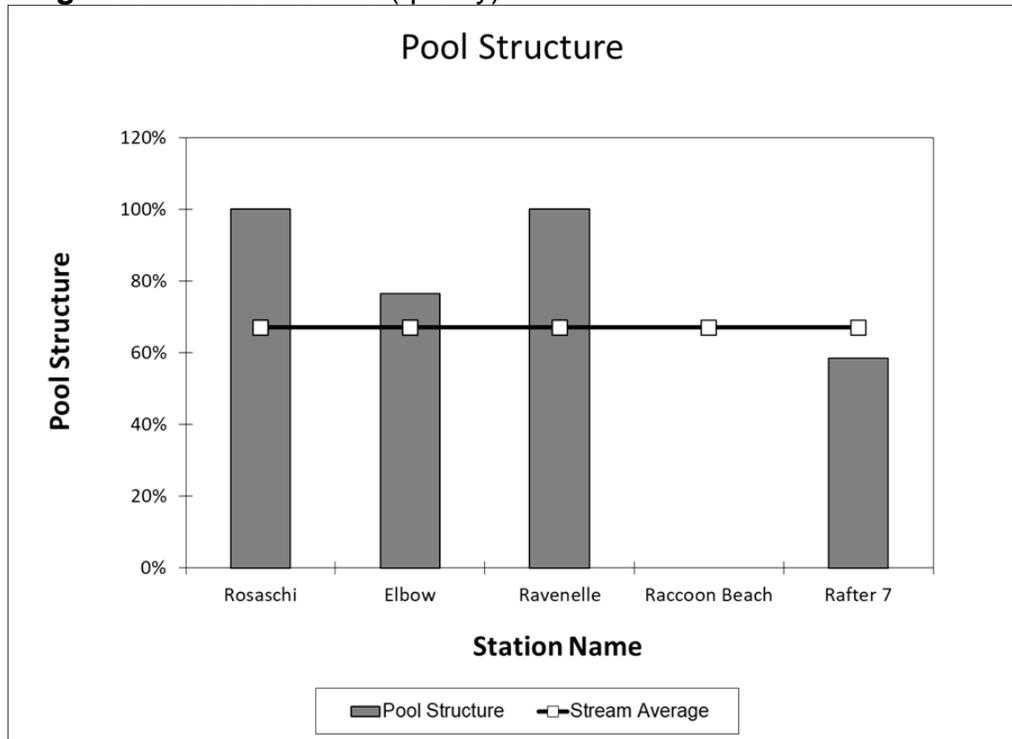


Figure 8. Pool Structure (quality).



Fall electroshocking results suggest that the fisheries are recovering from the drought observed from 2012 through 2015; however, flooding in 2017 may have reduced wild trout reproduction and recruitment. The typical trend of increasing trout abundance from downstream to upstream was observed again in 2017. The decline of trout abundance throughout the river during 2015 was concerning, based on the fishery data collected and alarmed anglers regarding lower than normal catch rates. This was likely due to drought conditions that caused in a reduction of flow and led to higher than normal water temperatures. Either this forced trout to migrate upstream prior to summer and fall or temperatures became lethal for trout in downstream areas. During 2016, all size classes of trout increased in abundance due to near normal flows. However, in 2017 very little reproduction was documented as a result of flooding. Mountain whitefish were only found at Rosaschi Ranch ($n=1$) and the Ravenelle ($n=2$) during 2017. During 2014 and 2015, no mountain whitefish were found, but in 2016, two were found at the Elbow suggesting habitat conditions were becoming favorable. This species is able to survive drought/flood cycles experienced frequently in the East Walker River.

In addition to habitat related stressors upon trout due to drought conditions, flash flooding degraded much of the river channel and fish habitat downstream of the Elbow. Fish surveys have shown that with the addition of large amounts of sediment, fish distribution and abundance were greatly affected. Habitat monitoring was initiated during 2016 and was continued and expanded in 2017. This work is used as base level monitoring towards natural recovery and determining fish habitat suitability for the different sections of the river. Several agencies as well as the public have expressed

interest in evaluating the river for its ability to support a coldwater trophy fishery, specifically the Rafter-7 area to become a state park.

The East Walker River continues to be popular among anglers in western Nevada. Angler success rates and size of fish caught were within the boundaries of management objectives and data collected during 2017 suggests conditions are improving. Anglers have become more satisfied with fishing success than they have been over the past couple of years.

RECOMMENDATIONS

- Conduct a general fisheries assessment through opportunistic angler contacts and mail-in, angler questionnaire, and drop box data.
- Conduct general fish habitat assessments on lands recently acquired by Nevada State Parks.
- Coordinate with land management agencies and private landowners to develop new public access and stocking locations where opportunities exist.
- Monitor fish populations along the East Fork during three days of tote-barge electroshocking at seven established sites during November.

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Date: March 2018

Figure 8. East Walker River Flash Flood Map, 2016. The Green Portion of the River Shows the Area of Heavy Sedimentation.



Figure 9. East Walker River Flash Flood Damage at Raccoon Beach, 2016.

