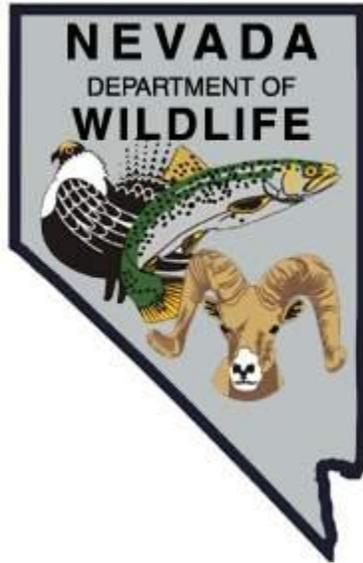


NEVADA DEPARTMENT OF WILDLIFE
STATEWIDE SPORT FISHERIES MANAGEMENT



FEDERAL AID JOB PROGRESS REPORTS

F-20-49
2013

WILSON SINK RESERVOIR
EASTERN REGION



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

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**NEVADA DEPARTMENT OF WILDLIFE, FISHERIES DIVISION
ANNUALJOB 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: *Wilson Sink Reservoir*
Period Covered: *January 1, 2013 through December 31, 2013*

SUMMARY

Wilson Sink Reservoir and headwaters received below average amounts of water in the form of winter/spring precipitation during 2013 for the second consecutive year, with the reservoir slowly filling throughout the spring. The reservoir did not reach full capacity and no overflow occurred through the spillway during 2013. Downstream irrigation demands during the late summer reduced the reservoir capacity to approximately 25% by October, with the improved boat ramp out of water by September. Angler visitation was considered light and angler success was limited and directly associated to drought related conditions.

Twelve days of opportunistic angler contacts conducted in 2013 contacted 42 anglers consisting of 39 trout anglers and 3 largemouth bass/trout anglers. Trout anglers reported catching 74 rainbow trout and harvesting 10 (14% of total rainbow trout caught) in 86 hrs of fishing effort for a catch rate of 0.86 rainbow trout per hour. Average size of 10 rainbow trout measured during creel surveys was 17.3 in FL and was above the long-term average of previous rainbow trout harvest lengths. Three largemouth bass anglers reported fishing 11 hrs to catch 17 largemouth bass for an annual catch rate of 1.55 largemouth bass per hour and 5.67 largemouth bass per angler. The average size of the six largemouth bass measured during the creel survey was 13.6 in TL. A total of 65,930 rainbow trout weighing 12,050 lbs and averaging 7.7 in FL were stocked in the spring and early summer to accommodate excess fish within the region and to address regional drought conditions.

Sport fish population surveys for Wilson Sink Reservoir consisted of one night of electroshocking in early June to assess the largemouth bass population and a gill net survey to evaluate and assess the rainbow trout population in conjunction with a rainbow trout strain evaluation study. A total of 59 largemouth bass were captured, ranging from 5.2 to 20.8 in TL. Electroshocking approximately 1,140 s to capture 59 largemouth bass and 3 rainbow trout equated to a capture rate of 196 fish per hour. The June sampling date produced larger than average catch frequency of the larger age classes (Class V+) of largemouth bass and was 36% higher than the long-term trend data over the last 15 yrs.

Two gill nets were fished on June 5 for a total of 24.5 hrs, with a total capture of 21 rainbow trout, 2 largemouth bass, and 3 bridge lip suckers for a capture rate of 1.1

fish per net hour. The rainbow trout had an average size of 13.7 in TL and an average weight of 21.9 oz, with the largest rainbow trout captured in 2013 being 15.8 in TL.

Collection of game fish from Wilson Sink Reservoir for mercury concentration analysis was performed during the June 7 population surveys, with 5 rainbow trout having an average size of 15.0 in TL and 5 largemouth bass with an average size of 10.7 in TL. The game fish samples were analyzed in summer 2013, with the rainbow trout averaging approximately 0.13 mg/Kg mercury and the largemouth bass averaging approximately 0.37 mg/Kg mercury.

On July 24, plankton/quagga mussel samples were collected at Wilson Sink Reservoir. Two samples from Wilson Sink Reservoir were collected and processed by two separate labs resulting in negative results for 2013.

A digital recording thermograph was placed in Wilson Sink Reservoir during May to estimate the timing and thermal limitations that influence success of the largemouth bass spawn. Preferred largemouth bass nesting and spawning temperatures were reached by the second week of May in 2013, with one minor water temperature fluctuation occurring near mid May, which should not have impacted the largemouth bass spawn.

No ocular surveys or fish salvages below the Wilson Sink Reservoir spillway and plunge pools occurred in 2013 because the reservoir did not reach full capacity or spill.

BACKGROUND

Largemouth bass were first introduced into Wilson Sink Reservoir in 1976 to serve as a biological control of nongame fish species found to be detrimental to the primary rainbow trout fishery. Within six years of largemouth bass introduction, nongame fish populations disappeared, with the exception of bridgelip sucker. Emphasis and management of largemouth bass as a secondary sport fishery began in 1984. Due to declining mature age classes of largemouth bass and annual recruitment in the population attributed to angler pressure and harvest, an 11 in minimum harvest length regulation was implemented in 1987.

In the spring of 1994, the reservoir and water rights owner, Petan Ranch, notified the Division of Wildlife of its intent to drain the reservoir to facilitate repairs to the outlet gate system. Largemouth bass were salvaged and relocated to other regional waters. On July 22, 1994, all possession limits and harvest size regulations for rainbow trout and largemouth bass were lifted to allow the public to harvest game fish prior to the impending draining of the reservoir. The reservoir was drained to a minimum pool of 610 acre-ft by October and dam repairs were completed in November. Restoration of the rainbow trout and largemouth bass fisheries began in the spring of 1995. Reintroduced largemouth bass naturally reproduced and rapidly established a population.

OBJECTIVES and APPROACHES

Objective: General Sport Fisheries Management

Approach:

- Conduct a general fisheries assessment through opportunistic angler contacts.
- Recover stranded sport fish from the pool below the dam after spring runoff and return them to the reservoir as needed.
- Install a digital recording thermograph to document temperature variations that relate to black bass activity.
- Examine the largemouth bass population by electroshocking 2 established transects one night in late summer.
- Set experimental gill nets for 4 net-nights in the spring.
- Collect 5 rainbow trout and 5 largemouth bass for mercury analysis.
- Sample for occurrence of quagga mussel veligers through plankton net tows conducted two to four times between June and September at one site. Conduct visual and tactile surveys of artificial and natural solid substrates in conjunction with veliger sampling.

PROCEDURES

Angler surveys were conducted throughout the year, with most of the fishing pressure occurring from April through August 2013. Data collected from anglers contacted included number of anglers in party, target species, amount and type of effort, and harvest. Harvest data was recorded by species, including length, weight of selected individuals, and fin clip or tag markings. Data were recorded and summarized on standard forms and maintained in the Regional Fisheries database.

During the nighttime of June 5, 2013, the Clark-Coffelt electroshocking barge was used to survey largemouth bass in Wilson Sink Reservoir. The fixed, twin anode system with two bow netters was used. Sample areas included the boat launch to the rocky point to the north, the rocky shoreline at the Petan Cabin, the rocky shoreline along the canyon arm, and the dam face and the gravel shoreline in front of the main campground. All largemouth bass age classes were targeted for capture. All captured bass and trout were measured, and selected individuals weighed for body condition appraisal. The electroshocker settings and other relevant survey information were:

Pulse: DC	Pulse Frequency: 60 Hz	Shocking Efficiency: Fair
Volts: 850	Pulse Width - 5 ms	Time: 2030–2130 hrs
Output: 5-6 A	Shocking Time: ~1,140 s	Water Temp: 63°F
Water Conditions – Algae absent, water level below spilling and weeds low.		

On June 5, 2013, two variable mesh gill nets measuring 150 ft long by 6 ft wide were set at Wilson Sink Reservoir primarily to capture trout species. Location of the gill nets were: net 1 was set directly 250 yds south of the boat launch and net 2 was set northeast of the Petan Ranch cabin. Both nets were fished overnight, retrieved the next morning, with all species of fish identified, measured, and counted. The electroshocking survey was also incorporated during the nighttime hours of 2030 to 2130 on June 5 to try to capture trout. Five rainbow trout and five largemouth bass were collected from the population surveys and shipped off to the US EPA for mercury concentration analysis.

Plankton net tows were conducted July 24, 2013 utilizing a 63 µm mesh plankton net to take vertical samples at various depths for the presence of quagga mussel veligers. These samples were then preserved in ethanol and sent off for analysis.

FINDINGS

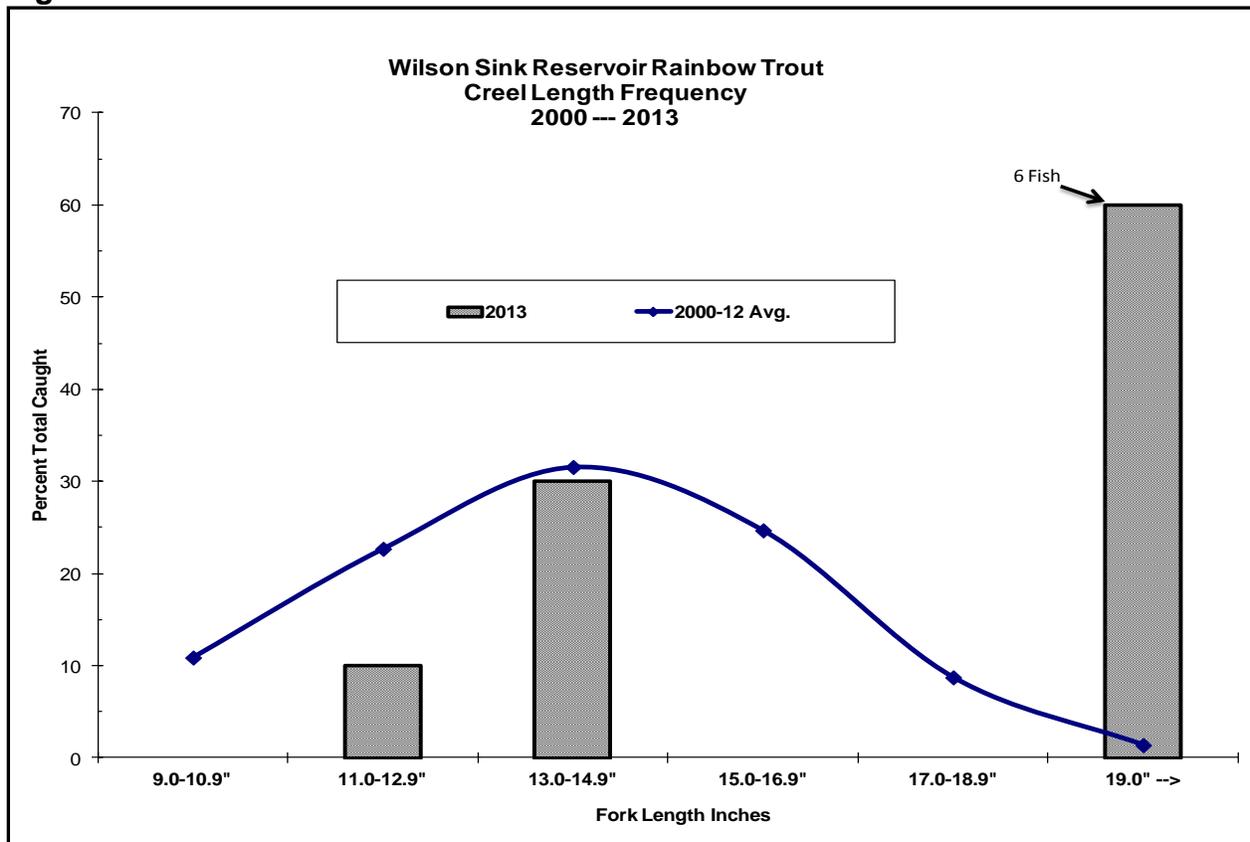
Opportunistic Angler Contacts and Surveys

The 2013 monthly and annual angler use, catch rate, and harvest summaries for Wilson Sink Reservoir are presented in Table 1. Twelve days of random angler surveys resulted in contacting 42 anglers, which consisted of 39 trout anglers and 3 largemouth bass anglers and/or combination anglers. Trout anglers reported catching 74 rainbow trout and harvesting 10 rainbow trout (14% of total rainbow trout caught) in 86 hrs of fishing effort. This equates to a catch rate of 0.86 rainbow trout per hour, which is higher than the long-term average of 0.68 rainbow trout per hour.

During the opportunistic angler survey, only 10 rainbow trout were measured and ranged in size from 12.2 to 18.9 in FL. The measured average size of 15.4 in exceeds the management goal of 13.0 to 14.0 in average harvest length. Figure 1 illustrates the length frequency analysis of the 10 rainbow trout caught in 2013 compared to the long-term trend from 2000 to 2012. Nine rainbow trout were weighed for C-Factor analysis during the angler survey. The average C-Factor was 4.11 for a rating of good. Composition of these rainbow trout revealed 11.1% in poor body condition, 55.6% fair, 0% good, and 33.3% in excellent condition.

Interest in largemouth bass angling was light for late spring and summer even though success was good. Three bass anglers reported fishing 11 hrs to catch 17 largemouth bass for an annual average catch rate of 1.55 largemouth bass per hour and 5.67 largemouth bass per angler. The average size of the six largemouth bass measured during random angler surveys was 13.6 in TL. Overall catch rate and fish per angler for largemouth bass for 2013 were above the long-term average of 0.83 bass per hour and 2.7 bass per angler day. Wilson Sink Reservoir continues to meet or exceed the management goal of a warm water fishery objective of 2.00 largemouth bass per angler day and a harvest size of 11.5 to 12.5 in TL.

Figure 1.



The volunteer angler drop-box was in use in 2013, with 23 surveys received from April through July. Anglers fished 129.5 hrs to catch 74 fish (73 rainbow trout and 1 largemouth bass) for a catch rate of 0.6 fish per angler hour and 3 fish per angler. Lengths were reported from 72 rainbow trout, with the majority (31.9%) being in the 11.0 to 12.9 in size range. This does not directly correspond with the 2013 creel survey length frequencies for measured trout (Figure 2). Anglers also reported measurements from one largemouth bass, with it measuring in the 11 to 12.9 in size range.

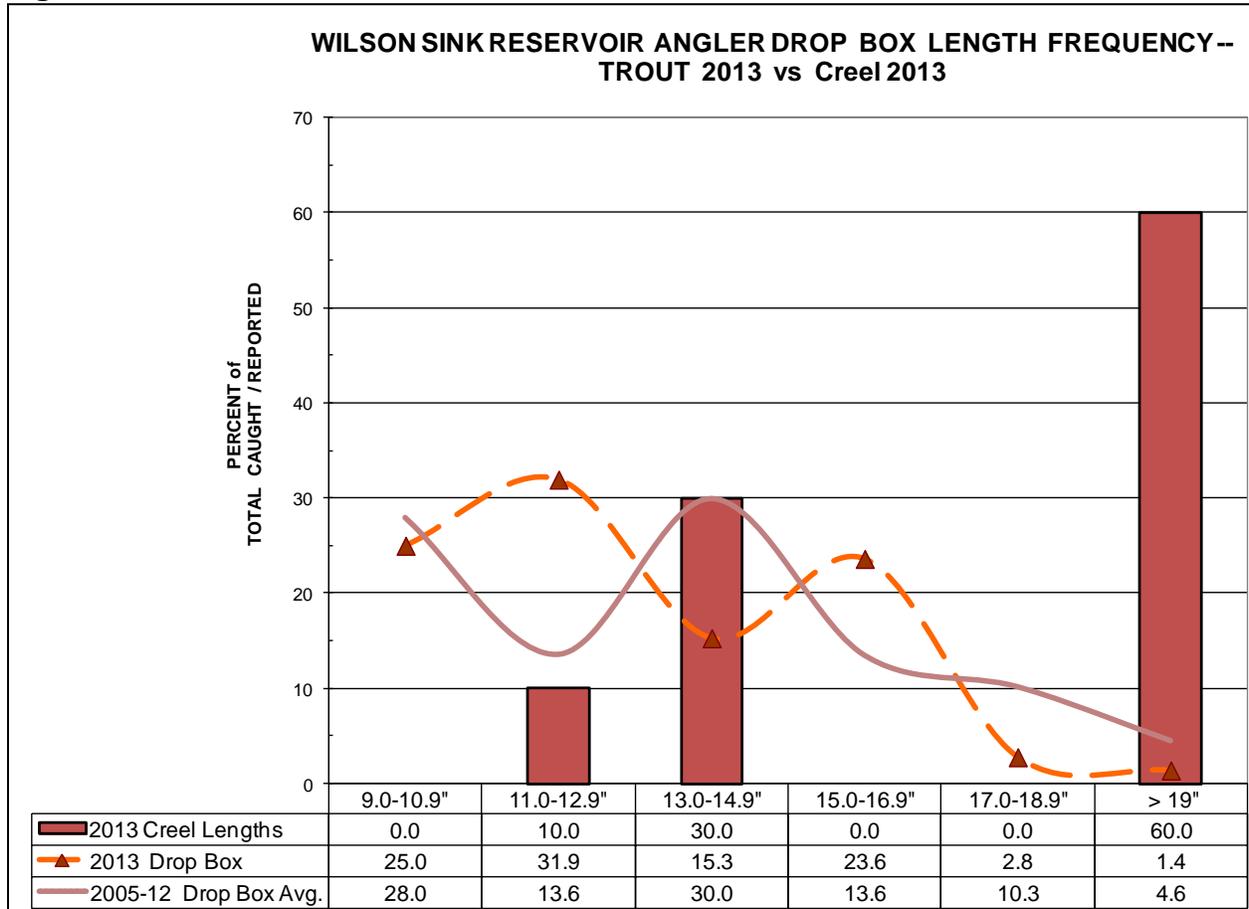
A total of 65,930 rainbow trout representing four different strains, weighing 12,050 lbs, and averaging 7.7 in were stocked into Wilson Sink Reservoir during the spring and early summer of 2013 (Table 2). A management decision was made to stock the fall allocation of rainbow trout early in June because of expected and realized low reservoir water levels due to extended drought conditions.

Spillway Channel Fish Salvage

No surveys or salvages occurred below the Wilson Sink Reservoir spillway due to the fact that no water spilled over the spillway during 2013. It was estimated that the reservoir only achieved a capacity of 90% due to the drought. This effort will be

evaluated on a year-by-year basis, dependent on duration and intensity of springtime overflow and amount of game fish present.

Figure 2.



Black Bass Electroshocking Population Survey

A total of 59 largemouth bass were captured during the early June sampling effort, ranging in total length from 5.2 to 20.8 in TL. Only three rainbow trout were collected and measured, with the average size being 14.6 in TL. No fin clipped rainbow trout, representing two different strains, were contacted in this survey.

An electroshocking effort of approximately 1,140 s to capture 59 bass and 3 rainbow trout equates to a capture rate of 196 fish per hour. The June sampling effort produced above average amounts compared to the 16 yr average numbers of largemouth bass for age classes V-VII+ (8.6 to >12.6 in) primarily due to 63°F water temperature. Age class distribution was 0% class I-II, 8% (5 fish) class III, 28% class IV (17 fish), 31% class V (19 fish), 15% class VI (9 fish), and 18% (11 fish) class VII and older (Figure 3). The largest bass captured was 20.8 in TL and weighed 7.73 lbs. The RSD-10 quotient was 80, indicating a largemouth bass population weighted toward

larger, mature fish (>10 in). The average size of all 61 bass was 10.0 in TL.

Largemouth Bass body condition calculated from 35 bass and ranged from 4.37 (fair) to 8.56 (excellent) for an average of 5.36 (good). The average condition value decreased from 6.02 (excellent) in 2011, but was identical to 2012 of 5.35 and up slightly from the 16 yr average rating of 5.32 (Good) (Table 3). Percent composition by group was 0% poor, 14.3% fair, 65.7% good, and 20% excellent.

The bass population appeared to be in very good health and dominated by the 10 to 13 in fish during the 2013 survey (Figure 4). Approximately 50% of the bass sampled were larger than the minimum harvest length of 10 in TL, significantly higher than previous sampling efforts.

Gill Net Survey

Two gill nets were fished for 24.5 hrs, with a total capture of 21 rainbow trout, 3 bridge lip suckers, and 2 largemouth bass for a capture rate of 1.1 fish per net hour. The rainbow trout had an average size of 13.7 in TL and an average weight of 21.9 oz, with the majority (58%) of the trout captured being represented by the spring rainbow planted in 2012. The largest rainbow trout captured in 2013 was 15.8 in TL. Of the 24 rainbow trout captured in the 2013 surveys, no fish had an adipose fin clip (Bel-Air strain) and no fish had a left pectoral fin clip (Eagle Lake strain) from the 2011 stocking effort.

A body condition value and rating was calculated on 17 rainbow trout captured in the gill nets, with 0 fish in the poor range, 0 fish in the fair range, 11 fish in the good range (64.7%), and 6 fish (35.3%) in the excellent range. The average size of fish was 13.7 in TL and the overall C-factor rating was 4.49 for a "Good" body condition. The three rainbow trout captured during nighttime electroshocking efforts in June were added to the gill net summary. The two largemouth bass captured during the gill net survey had an average size of 7.5 in TL, while the three bridge lip suckers captured in the Cabin net set had an average size of 11.2 in TL.

Figure 5 illustrates and evaluates rainbow trout lengths from the 2013 gill net and electroshocking surveys in comparison with the 2012 gill net survey. Larger trout (>17.0 in TL) were absent from the 2013 gill net survey, however, they were documented during limited creel survey measurements in 2013.

Water Temperature Monitoring

A thermograph was placed in Wilson Sink Reservoir on May 17 and retrieved on July 15, 2013. The electronic thermograph recorded reservoir water temperature for daily averages, with seasonal warm up of the water column occurring in early May.

Figure 3.

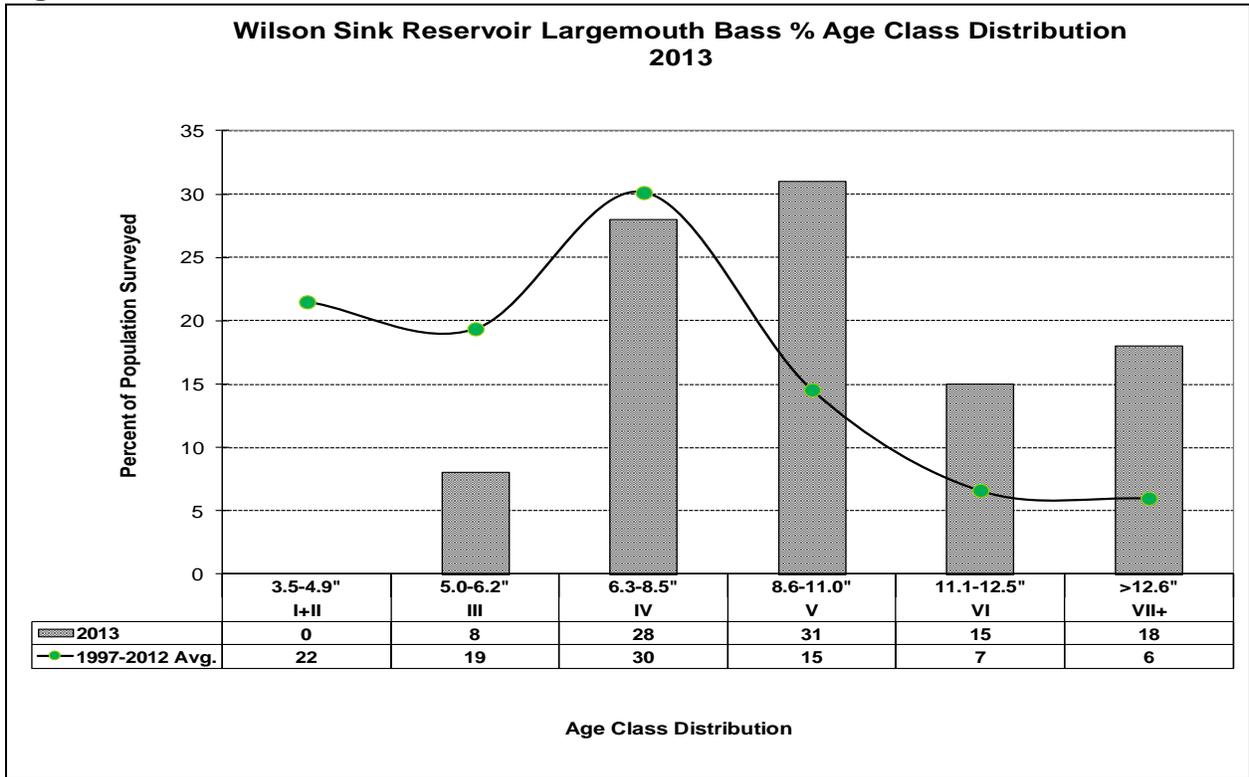


Figure 4.

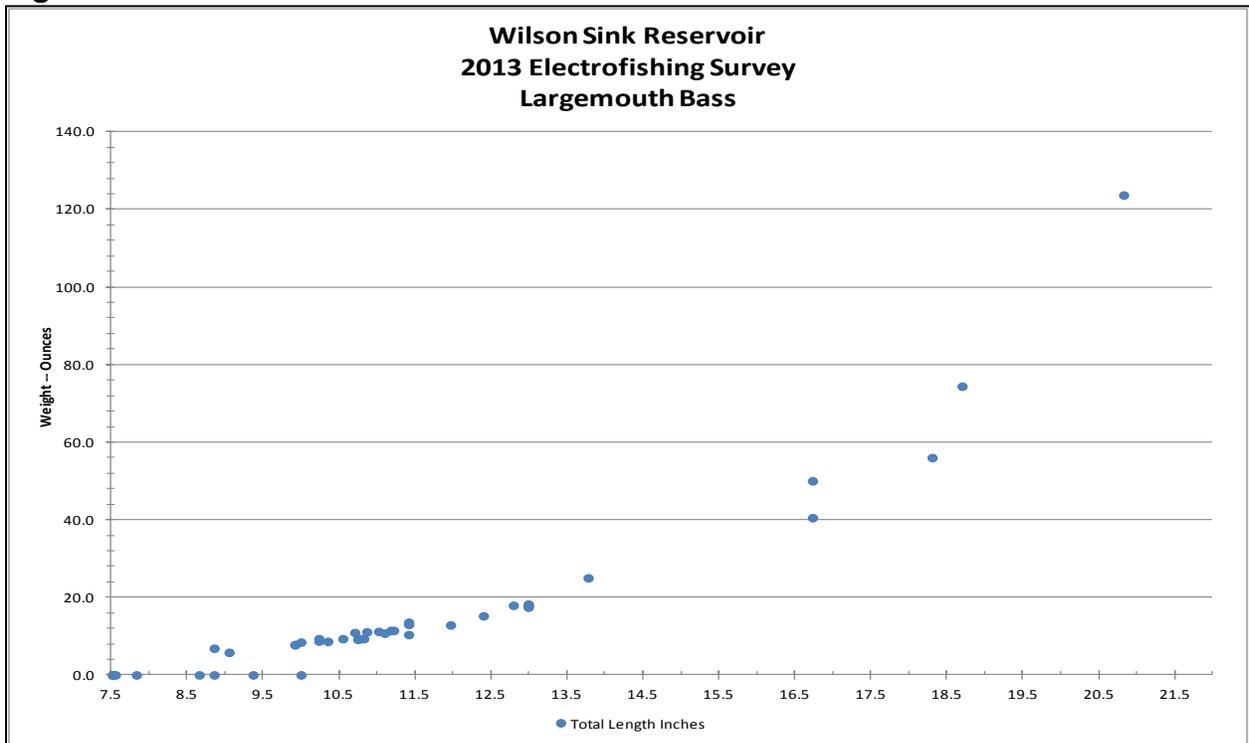
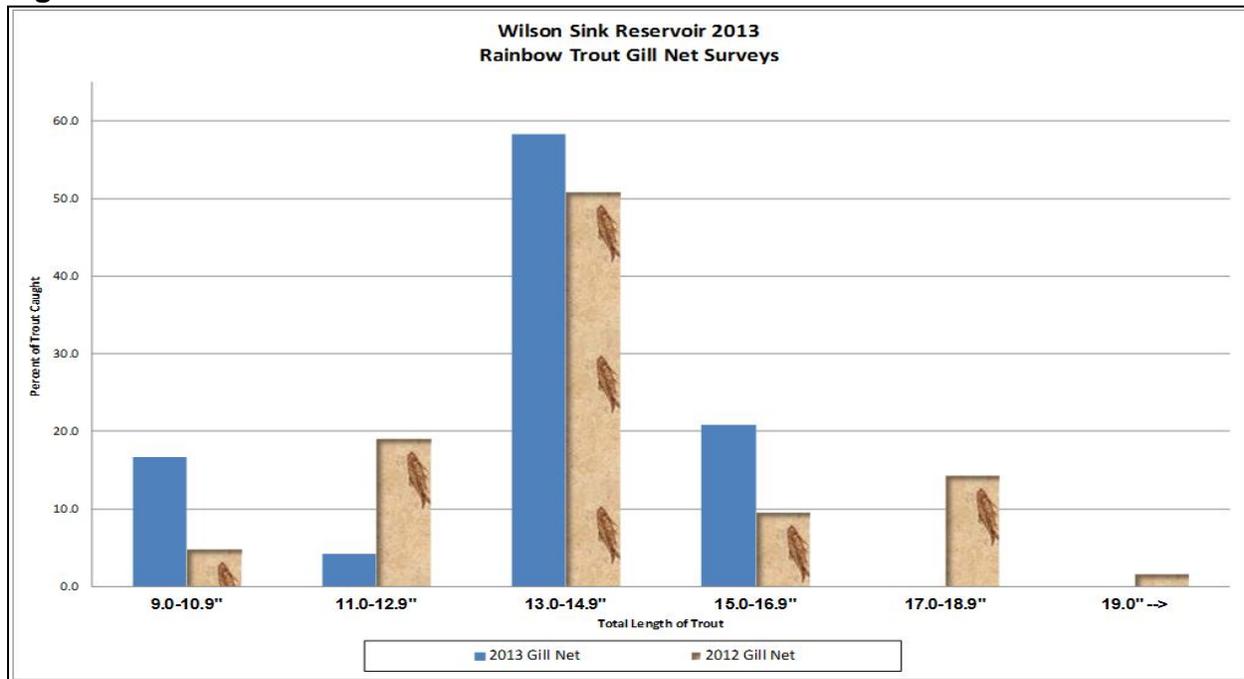


Figure 5



Desired largemouth bass nesting and spawning temperatures were not consistently reached until the second week of May, with one minor temperature fluctuation (cold front) occurring on May 24 and slowly returning to seasonal norms shortly thereafter. A seasonal high temperature of 79°F was recorded on July 2. Figure 6 illustrates daily high and low temperatures for the upper water column of Wilson Sink Reservoir for 2013.

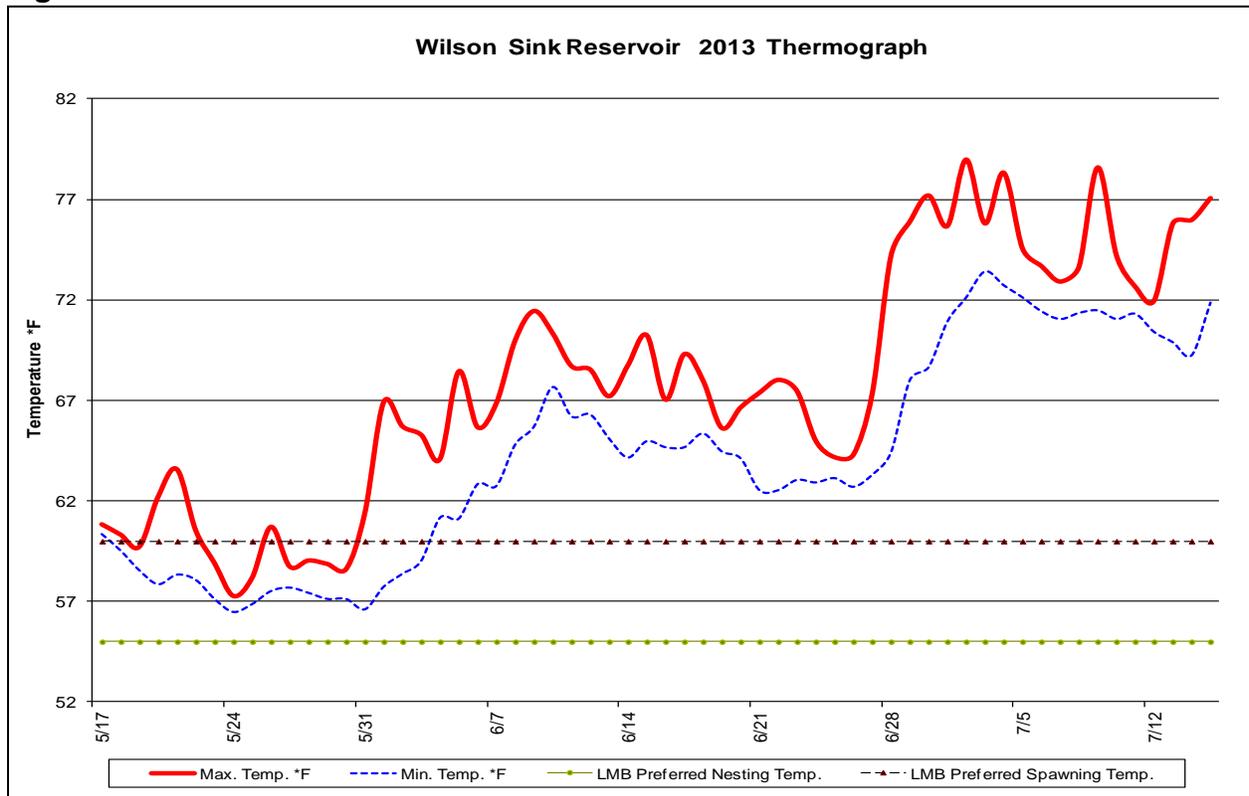
Quagga Mussel Monitoring

On July 24, quagga mussel samples were collected at Wilson Sink Reservoir. Two samples were collected and processed by two separate labs, resulting in negative results for 2013, similar to previous results.

Game Fish Collection for Mercury Analysis

Collection of game fish from Wilson Sink Reservoir for mercury concentration analysis was performed during the June 7 population survey, with 5 rainbow trout, average size of 15.0 in TL, and 5 largemouth bass, average size of 10.7 in TL. The US EPA Region IX lab in Richmond, CA analyzed the game fish samples during the summer of 2013, with the rainbow trout averaging 0.13 mg/Kg mercury and the largemouth bass averaging 0.37 mg/Kg mercury.

Figure 6.



MANAGEMENT REVIEW

All objectives for Wilson Sink Reservoir were completed in 2013.

RECOMMENDATIONS

- Continue opportunistic angler surveys to provide an accurate assessment of use and harvest of rainbow trout and largemouth bass.
- Maintain the volunteer angler drop-box to document activity and compare/analyze with contact creel data.
- Monitor the largemouth bass fishery and examine the effects of the 10 in minimum size harvest limit.
- Conduct an electroshocking survey to assess age class distribution, body condition, and RSD of the largemouth bass population.
- Monitor the reservoir water temperature during the spring to evaluate and predict largemouth bass spawning success.

- Continue salvaging game fish from below the Wilson Sink Reservoir spillway when necessary.

Prepared by: Chris Drake
Eastern Region Fisheries Biologist

Date: February 2014

Table 1

Wilson Sink Reservoir

2013 Creel Survey Angler Use and Harvest Summary

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Totals
No. Days Checked	1	0	1	1	2	2	1	2	0	2	0	0	12
Avg. Reservoir Water Temp.	Ice=8"			47	61	66	76	74		56			63
No. Anglers Checked	4			1	9	19	5	3		1			42
No. of Trout Anglers	4			1	7	18	5	3		1			39
No. of Bass Anglers	0			0	2	1	0	0		0			3
Total Hours Fished	6			2.0	25.0	42.5	11.0	8.0		2.5			97.0
Total Hours Fished -Trout	6			2.0	17.0	39.5	11.0	8.0		2.5			86.0
Total Hours Fished - Bass	0			0	8.0	3.0	0.0	0.0		0.0			11.0
Total Trout Caught	1			1	8	29	32	3		0			74
Total Bass Caught	0			0	14	3	0	0		0			17
Total Fish Harvested	1			0	12	5	0	1		0			19
Rainbow Trout	1			0	4	4	0	1		0			10
Largemouth Bass	0			0	8	1	0	0		0			9
Measured Fish Harvest Size													
Rainbow Trout No.	1	0	0	0	4	4	0	1		0			10
Average Size (inches FL)	19.3				20.1	15.4		12.0					17.3
Black Bass No.	0				5	1	0	0					6
Average Size (inches TL)					13.7	13.0							13.6
Angler Catch Rates													
Trout / Hour	0.17			0.50	0.47	0.73	2.91	0.38		0.00			0.86
Trout / Angler	0.25			1.00	1.14	1.61	6.40	1.00		0.00			1.90
Bass / Hour					1.75	1.00							1.55
Bass / Angler					7.00	3.00							5.67

Table 2

Wilson Sink Reservoir Fish Stocking

2013

Date	Number of Fish Stocked	Pounds	Avg. Size (in.)	Species	Number / Pound	Strain	Water Temp.	Tank Temp.
May 15, 2013	4,480	1,400	9.2	Rainbow Trout	3.2	Eagle Lake	68	53
May 17, 2013	9,540	1,800	7.8	Rainbow Trout	5.3	Eagle Lake	65	52
May 20, 2013	8,500	1,700	7.9	Rainbow Trout	5.0	Eagle Lake	65	54
May 22, 2013	8,160	1,700	8.0	Rainbow Trout	4.8	Eagle Lake	64	53
May 23, 2013	8,640	1,800	8.0	Rainbow Trout	4.8	Eagle Lake	64	54
June 6, 2013	10,125	1,250	6.8	Rainbow Trout	8.1	Jumper	73	53
June 10, 2013	9,625	1,250	6.9	Rainbow Trout	7.7	Jumper	68	52
June 13, 2013	1,800	500	8.9	Rainbow Trout	3.6	Shasta	70	52
July 12, 2013	2,400	300	6.8	Rainbow Trout	8.0	Tahoe	67	54
July 12, 2013	2,660	350	6.9	Rainbow Trout	7.6	Jumper	67	54
TOTALS	65,930	12,050	7.7	Avgerage	5.8	Avg. Temp. =	67	53

Table 3

WILSON SINK RESERVOIR
Largemouth Bass Population Status-Electrofishing Survey Trends

Year	Number of Bass / Hour	Number of Bass Measured	Average Fish Size TL Inches	RSD 10 Factor	K-Factor	Rating
1988	155			79	4.85	Fair
1989	133			57	4.81	Fair
1990	383			46	4.96	Fair
1991	244			-		
1992	309			29	5.05	Good
1993	816			-	5.15	Good
1994	Bass Salvage/Relocation					
1995	Reservoir Draining/No limits					
1996	Bass Stocking/Augmentation					
1997	549	159	7.5	8.2	4.97	Good
1998	298	136	8.2	16	4.89	Good
1999	339	208	5.7	55	5.27	Good
2000	113	40	7.0	100	5.58	Good
2001	85	47	8.9	60	5.08	Good
2002	157	94	9.0	56	5.18	Good
2003	72	115	10.0	81	4.96	Good
2004	123	117	7.1	35	5.33	Good
2005	83	99	6.9	38	5.20	Good
2006	141	181	7.5	58	5.50	Good
2007	134	298	8.8	34	5.23	Good
2008	216	114	8.3	54	5.52	Good
2009	189	119	5.9	32	5.18	Good
2010	162	130	7.9	39	5.80	Excellent
2011	249	142	6.9	18	6.02	Excellent
2012	156	88	9.6	62	5.35	Good
2013	186	61	10.0	80	5.36	Good
1997 - 2013 Avg.=	191	126	8.0	49	5.32	Good

RSD 10 = # of fish > 10 inches (*relative* quality catch length) / # of fish > 8.0 inches (*minimum* stock length)

RSD 10 between 40 and 60 is desired, indicating a balanced population

Biologists employ numerical descriptors of length-frequency data such as Proportional Stock Density (PSD) and Relative Stock Density (RSD) when evaluating fish populations. Proportional Stock Density is calculated by dividing the number of fish > minimum quality length by the number of fish > minimum stock length x 100. Quality length is defined as the minimum size of fish most anglers like to catch. Stock length is the minimum length at which a fish provides recreational value.

Relative Stock Density (RSD) is simply the percentage of any designated length group found within a population. RSD is calculated by dividing the number of fish > specified length by the number of fish > minimum stock length x 100.

Table 4

WILSON SINK RESERVOIR
Largemouth Bass % Age Class Distribution

Percent of Age Class

Year	I+II 3.5-4.9"	III 5.0-6.2"	IV 6.3-8.5"	V 8.6-11.0"	VI 11.1-12.5"	VII+ >12.6"
1988	15	25	13	32	14	2
1989	21	24	13	43	12	6
1990	50	27	12	5	3	3
1991	31	51	8	3	4	3
1992	23	20	21	28	4	4
1993	19	45	27	6	2	1
1994	Bass Salvage/Relocation					
1995	Reservoir Draining/No limits					
1996	Bass Stocking/Augmentation					
1997	33	17	40	6	4	0
1998	5	34	41	13	7	0
1999	55	2	9	12	19	2
2000	35	15	0	5	8	10
2001	13	13	38	3	8	25
2002	46	18	19	10	2	5
2003	37	30	11	7	4	6
2004	9	31	49	7	0	5
2005	25	16	38	16	3	2
2006	9	20	47	15	7	3
2007	1	14	24	51	8	2
2008	22	14	19	22	15	11
2009	33	23	34	4	3	2
2010	10	21	39	14	5	11
2011	6	35	46	10	1	2
2012	5	7	28	38	12	10
1997-2012 Avg.=	22	19	30	15	7	6
2013	0	8	28	31	15	18

All age class size distributions are approximations based on previous Wilson bass scale readings.