

**Cruise Report for the
Surface Waters Ambient Monitoring Program (SWAMP)
Long-Term Monitoring of Bass Lakes and Reservoirs in California.
Sampling Dates: April 28-October 21, 2015**

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1.0 Introduction

This work was performed as part of the Bioaccumulation Oversight Group (BOG) Work Plan in support of the Surface Water Ambient Monitoring Program (SWAMP) Bioaccumulation Project. The State Water Quality Control Board work was authorized via FY 14-15 in support of Work Order SJSURF-14SWBG01.

http://www.mywaterquality.ca.gov/monitoring_council/bioaccumulation_oversight_group/

Oversight for this Project was provided by the SWAMP Roundtable. The Roundtable is composed of State and Regional Water Board staff and representatives including USEPA, the California Department of Fish and Wildlife, the California Office of Environmental Health Hazard Assessment, and the California State Universities. The SWAMP Roundtable has formed a subcommittee, which focuses on bioaccumulation monitoring called the Bioaccumulation Oversight Group (BOG). The BOG is composed of State and Regional Water Board staff, USEPA, the Department of Fish and Wildlife, the San Jose State University Research Foundation, the Office of Environmental Health Hazard Assessment, and the San Francisco Estuary Institute. The members of the BOG individually and collectively possess extensive experience with bioaccumulation monitoring. Interested parties, including members of other agencies, consultants, and other stakeholders are also welcome to participate.

Between 2007 and 2008, a total of one hundred sixty two (162) water bodies were authorized for sample collection effort, in order to assess the bioaccumulation of contaminants in fish tissue. The target species were fish that are commonly caught and consumed by anglers and are good indicators of mercury, synthetic organics and selenium bioaccumulation. Two types of species were chosen based on their ability to best indicate the above contaminants. Top predatory species (ex. largemouth bass or trout) were targeted because mercury is biomagnified in tissue. Bottom-feeders (ex. carp or catfish) were collected as a second species due to their high lipid content which accumulate organic pollutants. Physical parameters were collected for each fish, which included: weight, total length, fork length, sex and if any abnormalities when present. A cross-section (~10cm) of tissue (steak) was collected from behind the head, wrapped in aluminum foil, placed in a zipper-closure bag and stored on dry ice. Samples were stored on dry ice until handed to MPSL/DFG lab for authorized analysis, per appropriate SOP's. Scales were collected from predatory species for age growth analysis, used in an age regression with mercury concentration. Black bass species were used for this analysis due to their high correlation of age to mercury concentration

The BOG has developed a set of monitoring objectives and assessment questions for a statewide program evaluating the impacts of bioaccumulation. This assessment framework is consistent with the frameworks developed for other components of SWAMP, and is intended to guide the bioaccumulation monitoring program over the long term. The primary emphasis of the statewide bioaccumulation monitoring program will be on evaluating status and trends. Bioaccumulation monitoring is a very effective and an essential tool for evaluating status, and is the most cost-effective tool for evaluating trends for many contaminants. Monitoring status and trends in bioaccumulation will provide information useful for identifying sources and pathways and for evaluating the effectiveness of management actions at a broader geographic scale.

The overall approach will establish a long-term cycle for sampling the one hundred ninety (190) priority black bass lakes and reservoirs (Appendix 1) that have been identified by the regional boards. Sampling of the entire group of lakes and reservoirs will occur in five biennial rounds of sampling over a 10-year period. This effort will ensure that each of these lakes is sampled once every 10-years to provide updated information on concentrations of priority contaminants. By creating five randomly selected subsets (or “rotating panels”) of the overall population, each round of sampling will yield a representative estimate of the statewide average mercury concentration. This will add to a long-term time series that will allow evaluation of the statewide trend in food web mercury. The BOG is coordinating with regional boards to significantly leverage the SWAMP statewide monitoring funds available for this survey. In 2015, the Los Angeles Regional Water Quality Control Board (Region 4) funded extensive sampling of Region 4 BOG lakes. This significantly increased the BOG statewide monitoring funds.

The overall goal of this sampling effort is to provide repeated measures of contaminant concentrations in fish to allow for status updates and assessment of long-term trends. The sampling therefore will largely replicate the approach used in prior sampling, as part of the 2007-2008 SWAMP survey (BOG 2007). One general difference from past sampling will be a narrower focus on mercury in black bass. Black bass tissue will be measured for mercury in all of the sampled lakes. PCB’s (Polychlorinated Biphenyl) and OCH’s (Organochlorine Pesticides) will only be measured at a subset of the lakes that have relatively high concentrations of these chemicals. High-lipid bottom-feeders (e.g., carp or catfish) will be targeted for organics analysis as well. In all the lakes sampled, 2-4 prey species (25-100mm, Total Length) were collected for mercury analysis to determine wildlife risk. This followed protocols from the BOG 2012-2013 BAF study.

(http://www.swrcb.ca.gov/water_issues/programs/swamp/docs/lakes_study/wildlife_mon_plan_03_2012.pdf)

In sport fish sampling while using an electroshocking boat, it is frequently necessary to sample over a linear course of 0.5 – 1 mi to obtain an adequate number of fish. For small lakes less than 500 ha in size, one sampling location covers a significant fraction of the surface area of the lake. For lakes of medium size (500 – 1000 ha), two locations will generally be sampled. For lakes in the large (1000 – 5000 ha) and very large categories (>5000 ha), two to four locations will be sampled. Since part of the goal of this study is to characterize human consumption of fish tissue, the existing locations have been established near centers of frequent fishing activity.

The size of the lakes in 2015 is often much less than during the 2007-2008 survey due to extreme drought (Figure 1). In many cases, previously sampled locations were dry or not accessible. In

several of the lakes, the number of sampled locations were reduced to reflect the current size or water level of the lake.



Figure 1. Shasta Lake, September 2015



Figure 2. Santa Margarita Lake, July 2015

1.0 Cruise Report

1.1 Objectives

The objectives were to follow the 2007-2008 sampling protocols and collect 12 individual black bass over a designated size range at each location in the 35 selected lakes. Additionally, prey fish (25-100 mm, total length) were sampled using traps, seines, electro shocking and dip nets from shoreline areas adjacent to the locations where sport fish are collected. Ten individuals each from two-four different prey fish species were sampled from each lake. Samplers targeted the following primary prey fish target species at all lakes: Mississippi silversides, threadfin shad, young-of-the-year black bass, young-of-the-year bluegill, and young-of-the-year green sunfish. Other species that were within the target size range were collected if the primary targets were not available. Efforts were made to sample the same species across all lakes. Fish that overlap in trophic guilds were sampled when these efforts were not possible. Fish tissue samples were analyzed as directed by SWRCB in Work Order No. 14SWBG01 (see Section 1.3 below)

1.2 MPSL/CDFW Sampling personnel

Gary Ichikawa	Crew Lead
Billy Jakl	Crew Lead
Sean Mundell	Crew Lead
Jon Goetzl	Environmental Scientist
Scot Lucas	Research Tech
April Guimaraes	Research Tech
John Negrey	Research Tech
Witold Piekarski	Research Tech
Mark Stephenson	CDFW Retired Annuitant

1.3 Authorization to collect samples

All sampling personnel are MPSL staff (San Jose State University Foundation and the California Department of Fish and Wildlife) contracted through San Jose State University Research Foundation (SJSURF) and the State Water Resources Control Board (SWRCB) to conduct the sample collection activities listed herein. The funding and authorization to collect the samples described herein is contained in the SWRCB Work Order 14SWBG01, including the description of the locations, number samples and species necessary to be collected at each lake.

1.4 Station selection

Based upon the selection of the BOG 2007-2008 Lakes and Reservoir Screening study and input from the regional boards, 35 lakes/reservoirs were selected to resample. Up to twelve black bass per location within each lake were targeted. Two to four prey species (10 fish/species) per water body were also targeted. Four lakes were designated for a bottom species collection for PCB and/or OCH analyses.

1.5 Summary of types of samples authorized to be collected

Ten to forty-four black bass, depending upon the size of the lake, were collected to better determine mercury trends. For bio-magnification estimates, 2-4 prey fish species were collected for mercury analysis.

Physical parameters were collected for each individual fish, which included: weight, total length, fork length, standard length (for prey species only) and presence of any abnormalities. Each adult black bass was individually tagged, wrapped in aluminum foil, placed in labeled zipper-closure bag and stored on dry ice for the duration of the trip.

At the MPSL lab, samples were stored in a freezer until they were processed for authorized analysis, per appropriate SOP's. Analysis authorization dictates tissue analysis (QA/QC requirements-preservatives, dissecting, etc.).

1.6 Discussion

A total of 31 of the 35 lakes were sampled. There was much greater than normal equipment malfunctions this year which led to scheduling difficulties and several re-sampling trips. Drought conditions also made boat launching challenging and/or impossible (Figure 2). Due to extremely low water levels, there was much reduced fish habitat in most of the water bodies. Four lakes were not sampled due to very little water or the lack of a reasonable way of getting the boat into the waterbody. These remaining 4 lakes will be sampled in 2016 if there is adequate water and boat access.

1.7 Results

A summary of number of prey and black bass samples collected from the 31 lakes are in Table 1.

Multiple MPSL teams sampled the 31 lakes. A more detailed fish catch, total length, descriptions and maps of sample collection for all lakes and species sampled are linked to Table 1.7.1 below.

Five of the lakes were funded by R4 and will be summarized in this report as well.

Table 1. 2015 BOG Fish Collection Summary

Region	StationName	Sport fish		Prey spp					
		Black Bass Spp	Common Carp	Bass Spp	Bluegill	Threadfin shad	Silverside	Green sunfish	other
1	Copco Lake	10	-	10					20
1	Ruth Lake	11		10	10				10
2	Vasona Reservoir	11	10	10	10		10		
3	Santa Margarita Lake	-	-	-					
3	Nacimiento, Lake	24		10	10	10			
4	Castaic Lake	22	10	10	10		10		
4	Elizabeth Lake								
4	Ken Hahn Park Lake	12		10	10				
4	Cerritos Park Lake	12			10	9			
4	La Mirada Park Lake								
4	Santa Fe Reservoir	12	5	10	10			10	
4	Balboa, Lake	0						10	10
5	Shasta Lake	44		10	10	10		10	
5	Beach Lake	11			10	10	10		
5	Berryessa, Lake	33		10	10	10			
5	Folsom Lake	22		10	10	10			
5	Camp Far West Reservoir	22		10	10	10			
5	Zayak/Swan Lake	11		10	10				
5	Butt Valley Reservoir	11		10			10		
5	Britton, Lake	11		10	10				
5	Camanche Reservoir	21		10	10	10		10	
5	New Melones Lake	22		10	10	10			
5	Woodward Reservoir	11		10	10	10			
5	Don Pedro Reservoir	19		10		10			
5	McSwain, Lake	11		10		10		10	
5	McClure, Lake	33		10	10	4			
5	Eastman Lake	22		10	10				
5	O'Neill Forebay	22	10	10	10		10		
5	545TU0164-BOG Other Lake 164								
5	Success Lake	11		10				10	10
5	Brite Valley Lake	11		10					10
7	Havasu, Lake	44		10	10	10			
7	Sunbeam Lake	11		10	10				
9	San Marcos, Lake	11		10	10	10			
9	Barrett	11				10	10		

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2015 BOG, Copco Lake (105PCL181)



Latitude: 41.97437

Longitude: -122.29869

Collection Method: Electrofisher boat

Date (s) of Collection: September 22, 2015

Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: Redear Sunfish, TL (mm)									
39	40	42	51	53	56	56	57	63	68

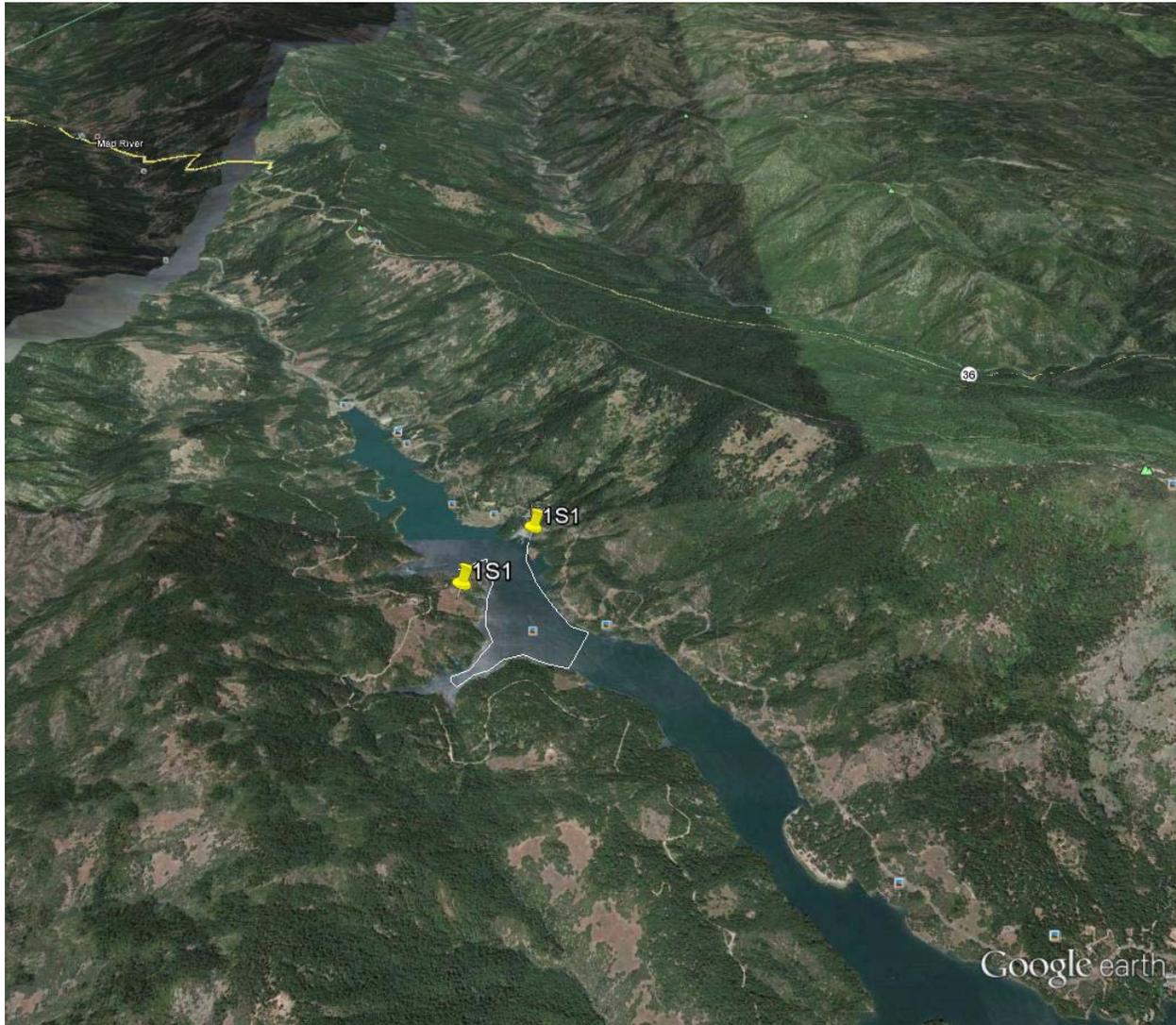
Prey Fish Caught: Yellow Perch, TL (mm)									
68	74	74	76	76	79	80	80	84	85

Sportfish Caught: Largemouth Bass, TL (mm)									
180	201	223	246	272	268	281	354	379	480

Comments: The boat was launched from the Mallard Cove public boat ramp. Due extremely low water, launching/retrieving the boat was very challenging. A sample of largemouth bass was collected in addition to 3 prey fish species. Bluegill, hitch and brown bullhead were seen.

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2015 BOG, Ruth Lake (109PRL193)



Latitude: 40.35025

Longitude: -123.41245

Collection Method: Electrofisher boat

Date (s) of Collection: September 22, 2015

Samplers: William Jakl and April Guimaraes

Prey Fish Caught: Bluegill, TL (mm)									
72	74	80	81	81	82	85	91	91	94

Prey Fish Caught: Smallmouth Bass, TL (mm)									
50	53	53	58	60	61	64	68	75	81

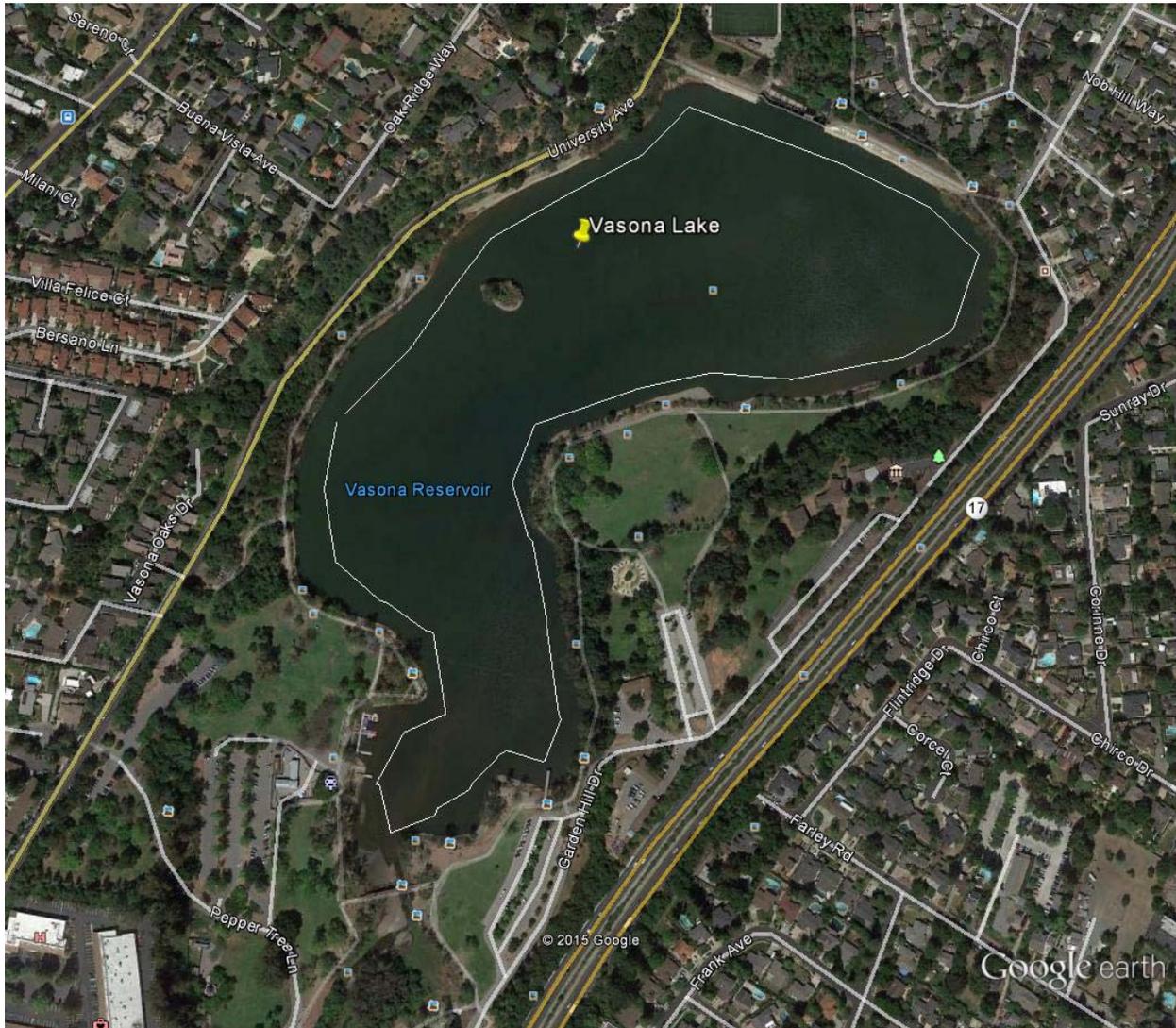
Prey Fish Caught: Brown Bullhead, TL (mm)									
52	56	59	62	75	77	89	90	92	100

Sportfish Caught: Largemouth Bass, TL (mm)										
226	223	273	262	326	351	366	359	342	358	458

Comments: The boat was launched from the Journey's End Resort boat ramp. A sample of largemouth bass was collected in addition to 3 prey fish species.

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2015 BOG Lakes, Vasona Lake (205PLV218)



Latitude: 37.24421

Longitude: -121.96811

Collection Method: Electrofisher boat

Date (s) of Collection: July 13, 2015

Samplers: Billy Jakl and Sean Mundell

Prey Fish Caught: Largemouth Bass, TL (mm)									
51	55	60	64	65	65	74	79	80	84

Prey Fish Caught: Bluegill, TL (mm)									
76	78	80	83	87	88	88	91	91	91

Prey Fish Caught: Silverside, TL (mm)									
60	60	61	62	65	65	66	67	69	70

Sportfish Caught: Largemouth Bass, TL (mm)										
237	235	260	310	316	306	330	280	405	525	495

Sportfish Caught: Carp, TL (mm)									
565	600	542	660	585	543	595	598	594	592

Comments: The sampling vessel was launched from the boat launch ramp near the paddle boat docks. Largemouth bass and carp were collected. Three prey fish species were collected. Sacramento suckers and gold fish were seen.

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2015 BOG Lakes, Santa Margarita (309PSM206)



Latitude: 35.32827

Longitude: -120.48879

Collection Method: Electrofisher boat

Date (s) of Collection: July 13, 2015

Samplers: Gary Ichikawa and Scot Lucas

Comments: There was no access to the lake due to extremely low water conditions. We will try and sample in 2016.

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2015 BOG Lakes, Lake Nacimiento (309PLN060)



Latitude: 35.75694

Longitude: -120.90901

Collection Method: Electrofisher boat

Date (s) of Collection: July 21-22, 2015

Samplers: Billy Jakl and Sean Mundell

Prey Fish Caught: Bluegill, TL (mm)									
65	66	67	69	70	72	72	75	76	78

Prey Fish Caught: Spotted Bass, TL (mm)									
56	72	74	74	78	80	80	85	87	90

Prey Fish Caught: Threadfin Shad, TL (mm)									
85	89	90	92	92	92	93	96	99	100

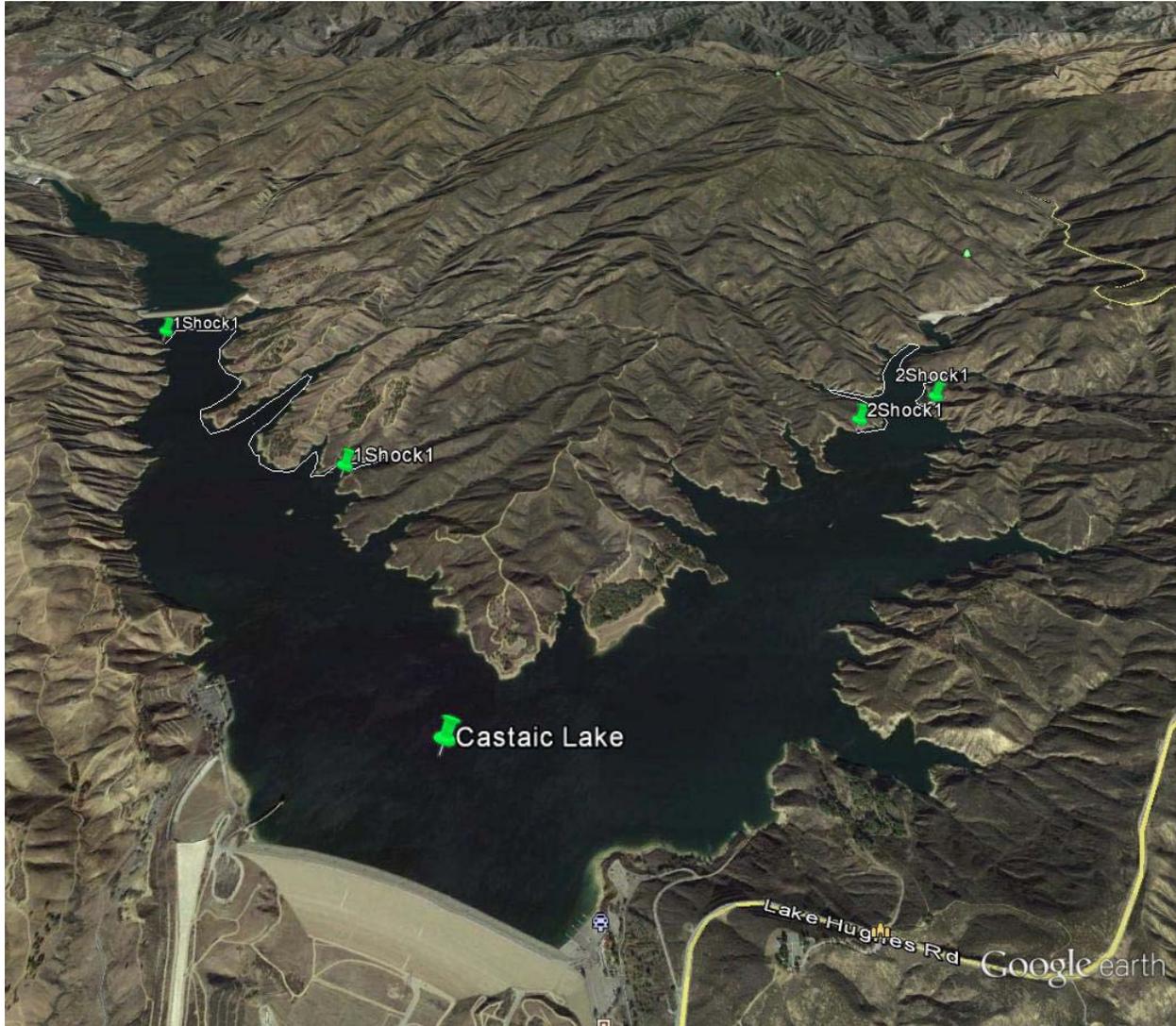
Location 1, Sportfish Caught: Spotted Bass, TL (mm)						
384	289	246	202	235	294	
300	313	359	360	355	360	410

Location 2, Sportfish Caught: Spotted Bass, TL (mm)										
232	235	296	275	324	339	342	365	334	396	408

Comments: The sampling vessel was launched from the main ramp. Due to the low levels of water, 2 locations were sampled instead of 3 locations previously sampled. Spotted bass were collected at the 2 locations in addition to 3 samples of prey fish species. A couple of largemouth bass, black crappie, carp and sculpin were seen.

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2015 BOG Lakes, Castaic Lake (403CASTLK)



Latitude: 34.55562

Longitude: -118.62811

Collection Method: Electrofisher boat

Date (s) of Collection: April 28, 2015

Samplers: Gary Ichikawa and Jon Goetzl

Prey Fish Caught: Bluegill, TL (mm)									
50	61	70	48	46	52	50	45	58	50

Prey Fish Caught: Largemouth, TL (mm)									
92	89	85	90	90	97	87	90	80	91

Prey Fish Caught: Silverside, TL (mm)									
90	82	80	90	90	79	85	89	88	76

Location 1 Sportfish Caught: Largemouth, TL (mm)										
201	218	275	285	338	412	322	401	382	370	451

Location 1 Sportfish Caught: Striped Bass, TL (mm)				
455	435	484	495	502

Location 1 Sportfish Caught: Carp, TL (mm)				
630	552	564	576	592

Location 2 Sportfish Caught: Largemouth, TL (mm)										
242	249	276	288	470	438	376	355	330	362	367

Location 2 Sportfish Caught: Carp, TL (mm)				
572	615	585	584	595

Comments: The collection of fish at this lake was funded by Region 4. The sampling vessel was launched from the main boat launch ramp. Largemouth bass and carp were collected at both locations in addition to striped bass at Location 1. Three prey species were collected. The lake level was over 35 meters lower than last year.

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2015 BOG Lakes, Elizabeth Lake (403ELIZLK)



Latitude: 34.66743

Longitude: -118.41166

Collection Method: Electrofisher boat

Date (s) of Collection: June 2, 2015

Samplers: Billy Jakl and Sean Mundell

Comments: The collection of fish at this lake was funded by Region 4. There was no access to the lake due to extremely low water conditions. We will try and sample in 2016.

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2015 BOG, Ken Hahn Park Lake (404KHANPK)



Latitude: 34.00896

Longitude: -118.37025

Collection Method: Electrofisher boat

Date (s) of Collection: July 14, 2015

Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: Bluegill, TL (mm)									
81	87	78	82	86	44	78	81	82	87

Prey Fish Caught: Largemouth, TL (mm)									
81	72	38	71	70	44	51	60	63	85

Sportfish Caught: Largemouth, TL (mm)					
232	241	250	279	353	324
348	320	363	341	486	412

Sportfish Caught: Bluegill, TL (mm)									
117	126	125	146	139	160	162	167	153	181

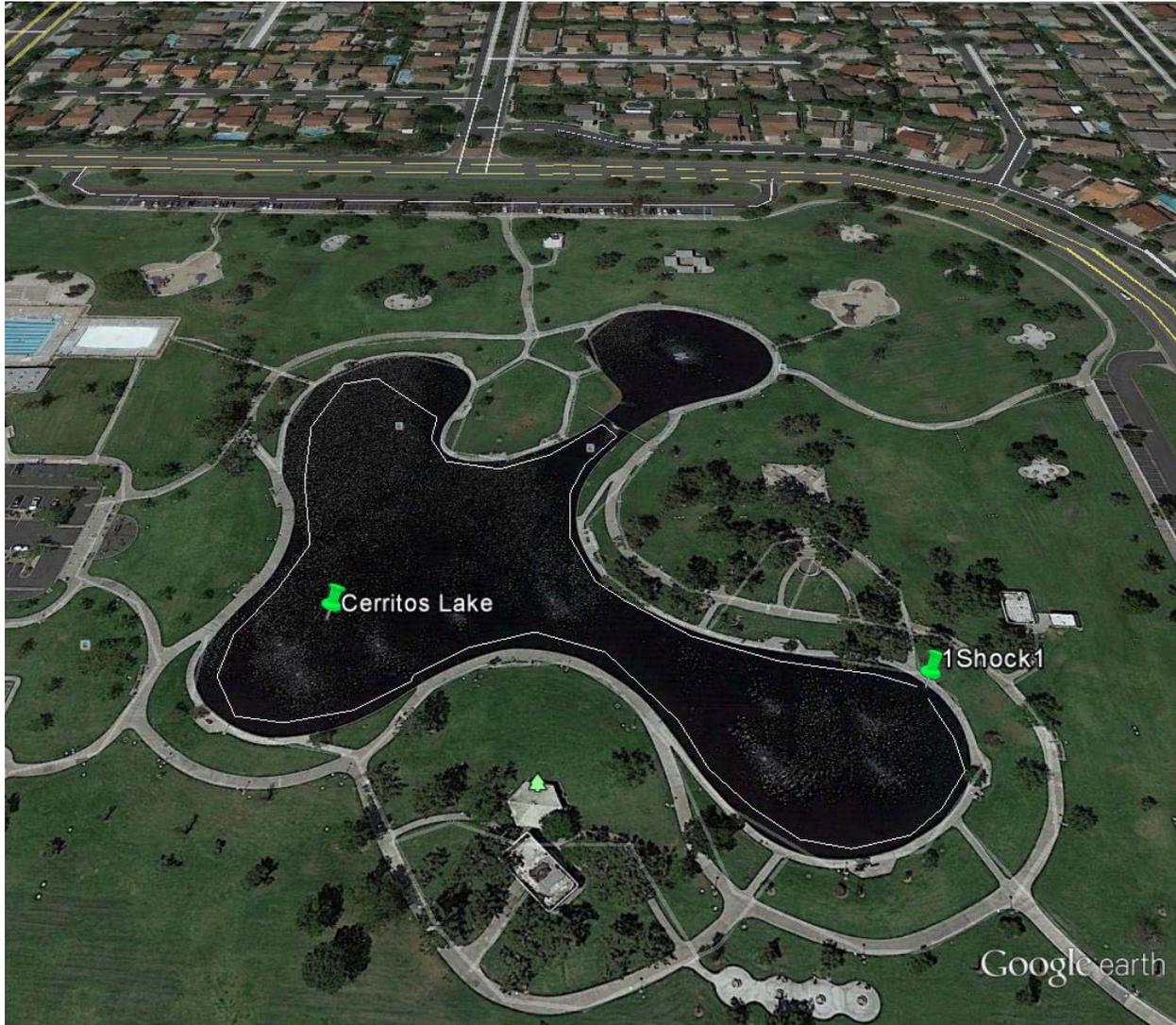
Sportfish Caught: Carp, TL (mm)		
690	749	727

Sportfish Caught: Channel Catfish, TL (mm)
536

Comments: The collection of fish at this lake was funded by Region 4. The sampling vessel was launched from the side of the lake using portable ramps. The whole lake was sampled several times. Two samples of prey fish were collected in addition to four sport fish species using the electrofisher boat. One black crappie was seen.

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2015 BOG Lakes, Cerritos Park Lake (405CERRLK)



Latitude: 33.85116

Longitude: -118.05929

Collection Method: Electrofisher boat

Date (s) of Collection: June 23, 2015

Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: Threadfin Shad, TL (mm)									
118	111	125	108	111	94	136	101	111	

Prey Fish Caught: Bluegill, TL (mm)									
87	93	92	79	86	80	83	96	84	93

Sportfish Caught: Largemouth, TL (mm)					
184	260	312	284	315	355
348	362	389	399	426	426

Sportfish Caught: Bluegill, TL (mm)				
125	167	167	189	210

Sportfish Caught: Carp, TL (mm)				
761	709	831	726	

Comments: The collection of fish at this lake was funded by Region 4. The sampling vessel was launched from the lake bank near coordinates above. Portable ramps and a 4X4 vehicle were needed to launch/retrieve the boat. Two samples of prey fish was collected in addition to three sport fish species using the electrofisher boat. The entire lake was sampled.

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2015 BOG Lakes, La Mirada Park Lake (405LAMIRA)



Latitude: 33.90424

Longitude: -118.00529

Collection Method: Electrofisher boat

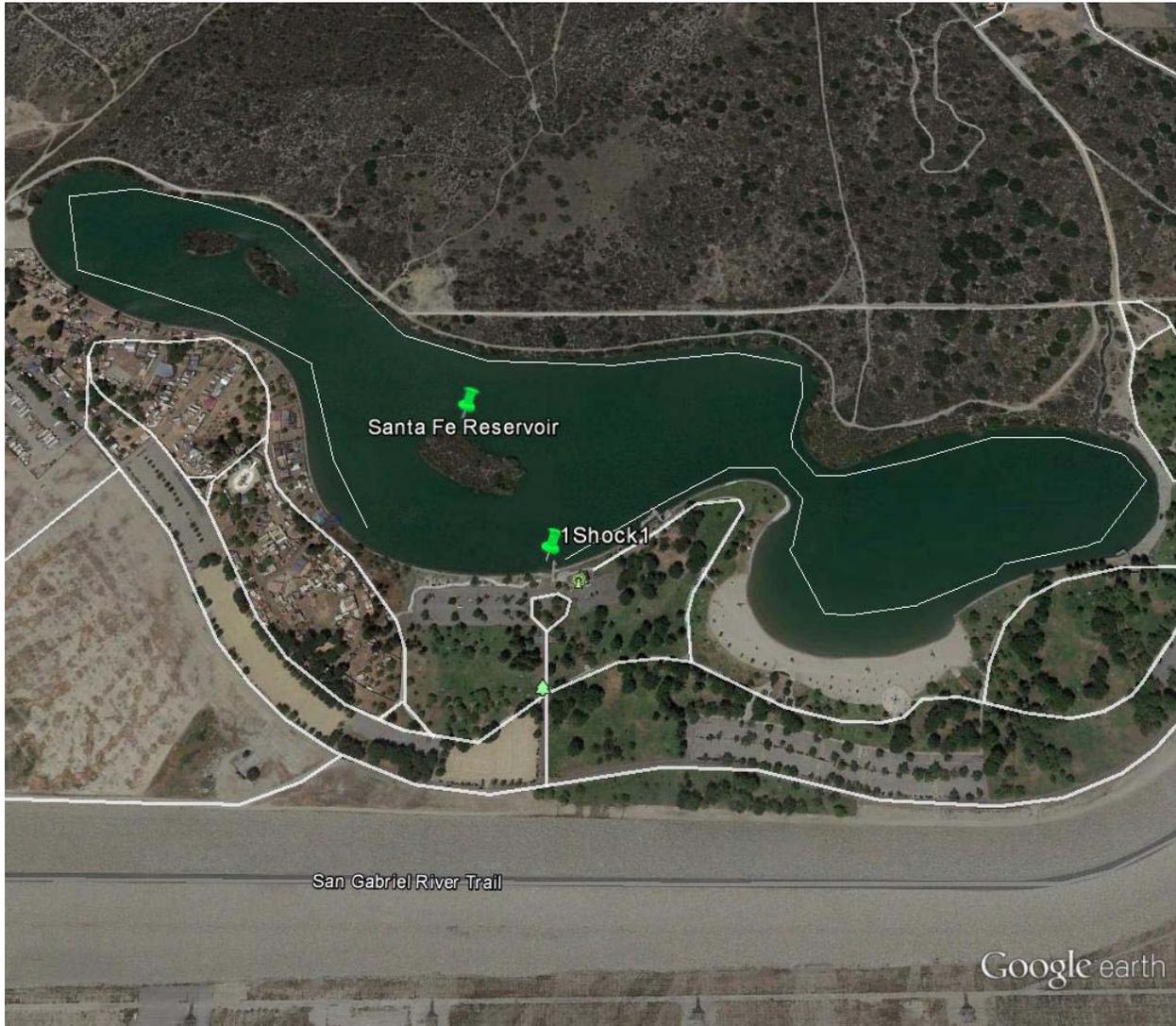
Date (s) of Collection: June 23, 2015

Samplers: Gary Ichikawa and Scot Lucas

Comments: The collection of fish at this lake was funded by Region 4. There was no access to the lake due to extremely low water conditions. We will try and sample in 2016.

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2015 BOG Lakes, Santa Fe Reservoir (405PSF067)



Latitude: 34.11563

Longitude: -117.95527

Collection Method: Electrofisher boat

Date (s) of Collection: May 6, 2015

Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: Bluegill, TL (mm)									
60	94	57	58	68	58	62	60	80	66

Prey Fish Caught: Largemouth, TL (mm)									
52	64	41	33	54	49	36	53	45	49

Prey Fish Caught: Green Sunfish, TL (mm)									
93	86	98	91	71	83	93	93	81	70

Sportfish Caught: Largemouth, TL (mm)					
241	241	285	311	344	329
352	350	376	392	411	428

Sportfish Caught: Bluegill, TL (mm)									
135	147	150	146	156	126	173	145	139	141

Sportfish Caught: Carp, TL (mm)				
634	676	662	624	660

Sportfish Caught: Black Bullhead, TL (mm)	
440	

Sportfish Caught: Channel Catfish, TL (mm)	
447	

Sportfish Caught: Blue Catfish, TL (mm)	
528	

Comments: The collection of fish at this lake was funded by Region 4. The sampling vessel was launched from the main reservoir ramp. Three samples of prey fish were collected in addition to two sport fish species.

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2015 BOG, Lake Balboa (412BALBOA)



Latitude: 34.18207

Longitude: -118.49474

Collection Method: Electrofisher boat

Date (s) of Collection: July 7, 2015

Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: Convict Cichlid, TL (mm)									
90	71	77	73	69	57	53	89	83	82

Prey Fish Caught: Green Sunfish, TL (mm)									
70	63	60	72	51	57	43	53	57	54

Sportfish Caught: Plecostomus, TL (mm)					
466	405	415	446	436	
411	421	450	391	376	

Comments: The collection of fish at this lake was funded by Region 4. The sampling vessel was launched from the main launch ramp. Two samples of prey fish were collected using the electrofisher boat. One of the species of prey fish was convict fish, an aquarium fish. The only large fish we saw was a Plecostomus species, another aquarium fish. They were very numerous in this lake and the dominant species. One carp, tilapia and redear sunfish were seen.

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**2015 BOG, Shasta Lake (506PSH018)
at the dam (L1)**



Latitude: 40.72972
Longitude: -122.43963
Collection Method: Electrofisher boat
Date (s) of Collection: September 21, 2015
Samplers: William Jakl and April Guimaraes

Prey Fish Caught: Green Sunfish, TL (mm)									
47	47	48	48	48	51	52	58	59	67

Prey Fish Caught: Smallmouth Bass, TL (mm)									
56	59	60	62	66	68	68	72	75	85

Prey Fish Caught: Threadfin Shad, TL (mm)									
74	77	78	78	78	78	80	81	81	92

Prey Fish Caught: Bluegill, TL (mm)									
70	75	81	82	85	88	95	96	97	100

Location 1, Sportfish Caught: Smallmouth Bass, TL (mm)										
220	223	233	256	306	365	325	346	326	432	455

Comments: The boat was launched from the Centimudi public boat ramp. A sample of smallmouth bass was collected in addition to 4 prey fish species.

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**2015 BOG, Shasta Lake (506PSH018)
at Pit River arm (L2)**



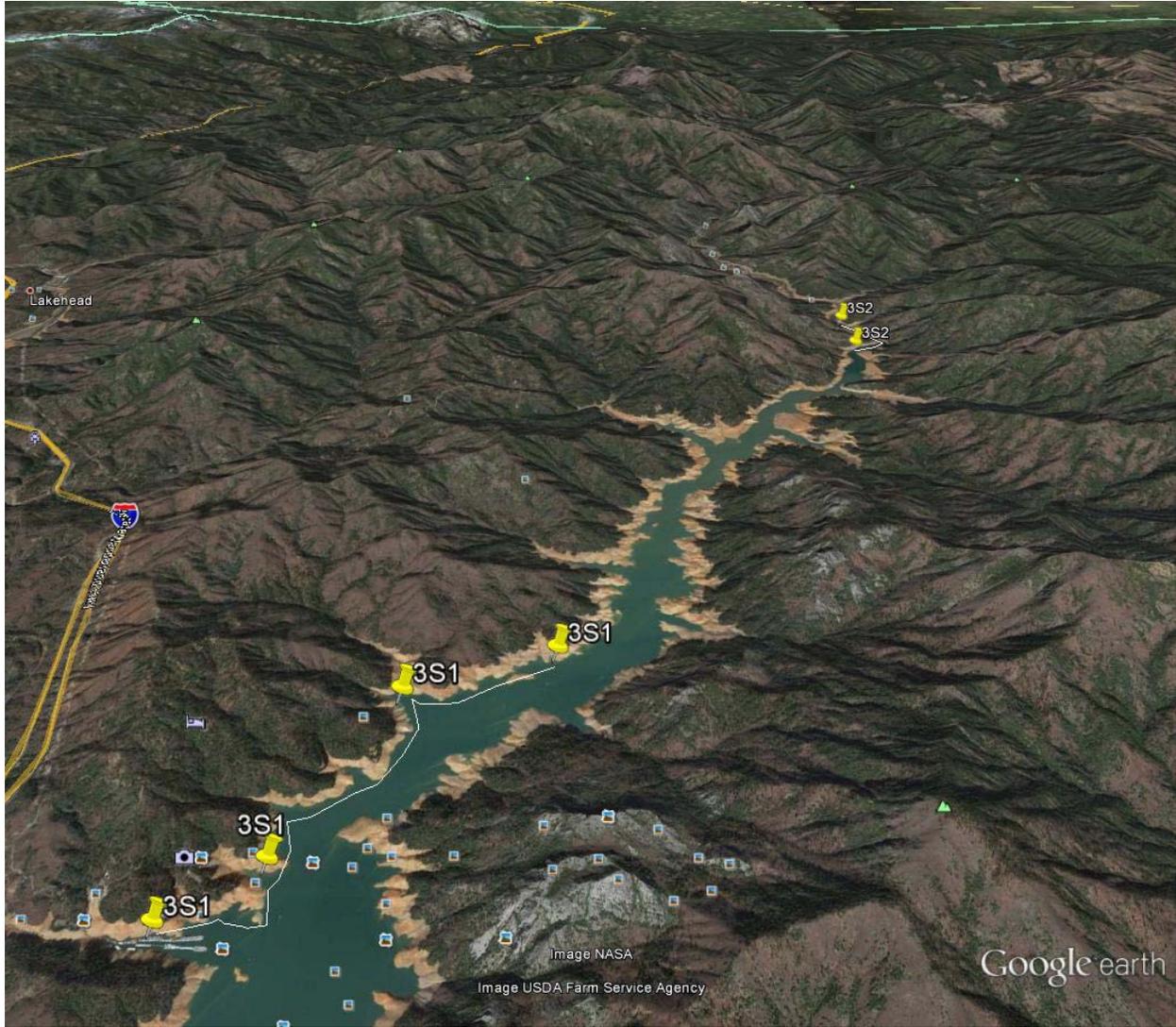
Latitude: 40.74537
Longitude: -122.21977
Collection Method: Electrofisher boat
Date (s) of Collection: September 21, 2015
Samplers: Gary Ichikawa and Scot Lucas

Location 2, Sportfish Caught: Smallmouth Bass, TL (mm)										
221	233	276	293	315	307	311	348	355	370	415

Comments: The boat was launched from the Jones Valley Resort boat ramp. A sample of smallmouth bass was collected. Channel catfish were seen.

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**2015 BOG, Shasta Lake (506PSH018)
at the McCloud River arm (L3)**



Latitude: 40.82348
Longitude: -122.27572
Collection Method: Electrofisher boat
Date (s) of Collection: September 23, 2015
Samplers: William Jakl and April Guimaraes

Location 3, Sportfish Caught: Smallmouth Bass, TL (mm)										
237	239	297	297	328	344	360	328	398	407	428

Comments: The boat was launched from Bridge Bay Resort boat ramp. A sample of smallmouth bass was collected.

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**2015 BOG, Shasta Lake (506PSH018)
at the Sacramento River arm (L4)**



Latitude: 40.85160
Longitude: -122.39423
Collection Method: Electrofisher boat
Date (s) of Collection: September 22, 2015
Samplers: Gary Ichikawa and Scot Lucas

Location 4, Sportfish Caught: Smallmouth Bass, TL (mm)										
234	237	264	258	305	348	377	345	341	421	360

Comments: The boat was launched from the Sugar Loaf public boat ramp. A sample of smallmouth bass was collected.

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2015 BOG, Beach Lake (510BECHLK)



Latitude: 38.43846

Longitude: -121.48335

Collection Method: Electrofisher boat

Date (s) of Collection: October 6, 2015

Samplers: Gary Ichikawa, Mark Stephenson and Witold Piekarski

Prey Fish Caught: Bluegill, TL (mm)									
64	75	80	88	89	89	93	94	98	98

Prey Fish Caught: silverside, TL (mm)									
51	57	59	61	63	67	76	79	83	83

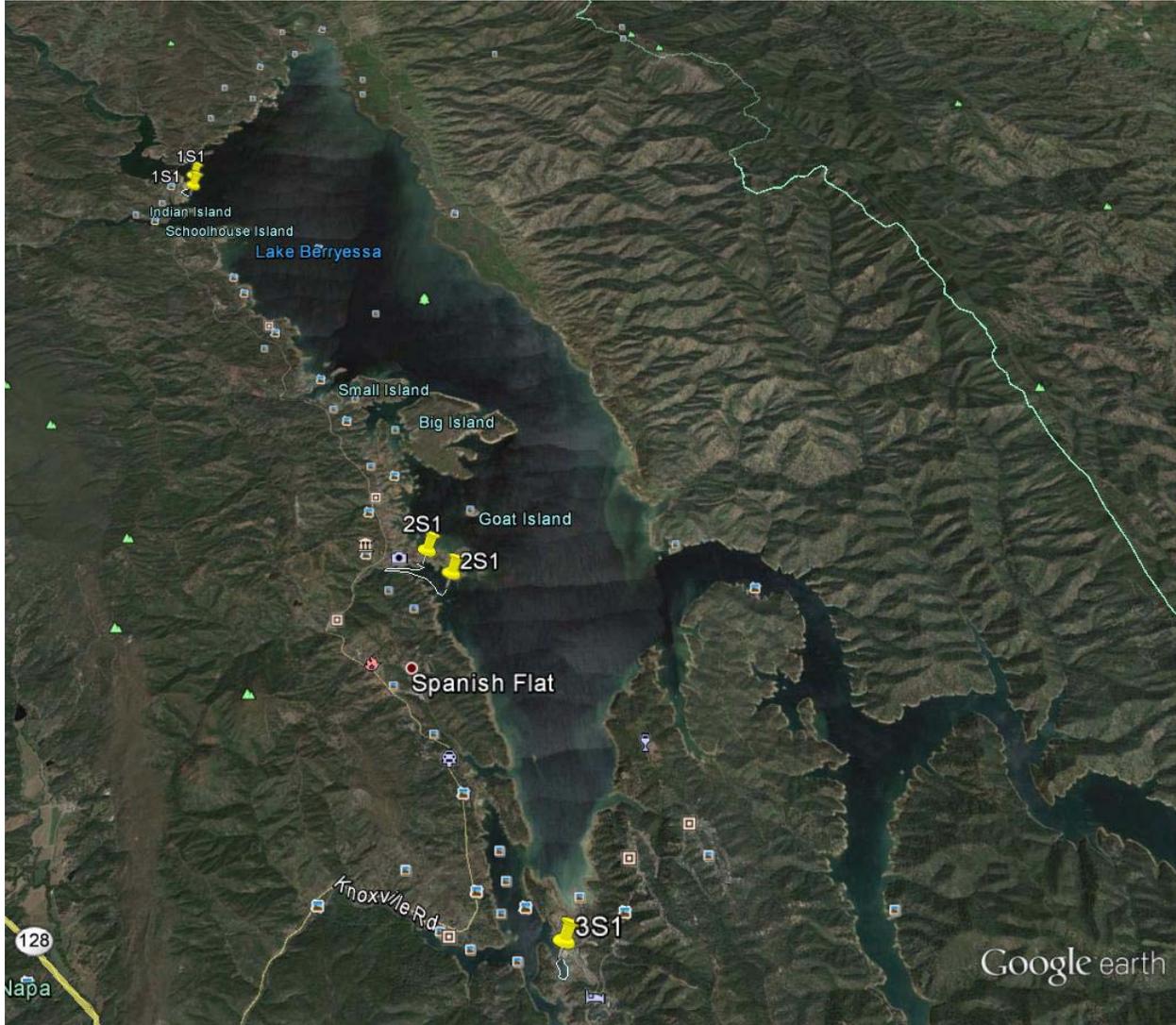
Prey Fish Caught: Threadfin Shad, TL (mm)									
69	70	73	76	80	82	82	87	87	93

Sportfish Caught: Largemouth Bass, TL (mm)										
240	266	306	320	340	378	333	322	403	445	493

Comments: Access permission was needed from the Sacramento Regional Wastewater Treatment Plant. The boat was launched from the bank of the lake. 4X4 and ramps were necessary to launch/retrieve the boat. The whole lake was sampled. A sample of largemouth bass samples was collected in addition to 3 samples of prey fish species. Channel catfish, black crappie and carp were seen.

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2015 BOG, Berryessa Lake (511PLB077)



Latitude: 38.62395

Longitude: -122.28434

Collection Method: Electrofisher boat

Date (s) of Collection: August 24, 2015

Samplers: Gary Ichikawa and Jon Goetzl

Prey Fish Caught: Bluegill, TL (mm)									
48	52	54	60	62	64	65	66	67	75

Prey Fish Caught: Smallmouth Bass, TL (mm)									
53	62	62	62	62	63	65	66	66	69

Prey Fish Caught: Threadfin Shad, TL (mm)									
70	82	82	85	87	88	88	89	92	99

Location 1, Sportfish Caught: Largemouth Bass, TL (mm)										
222	238	260	255	365	368	357	395	392	375	430

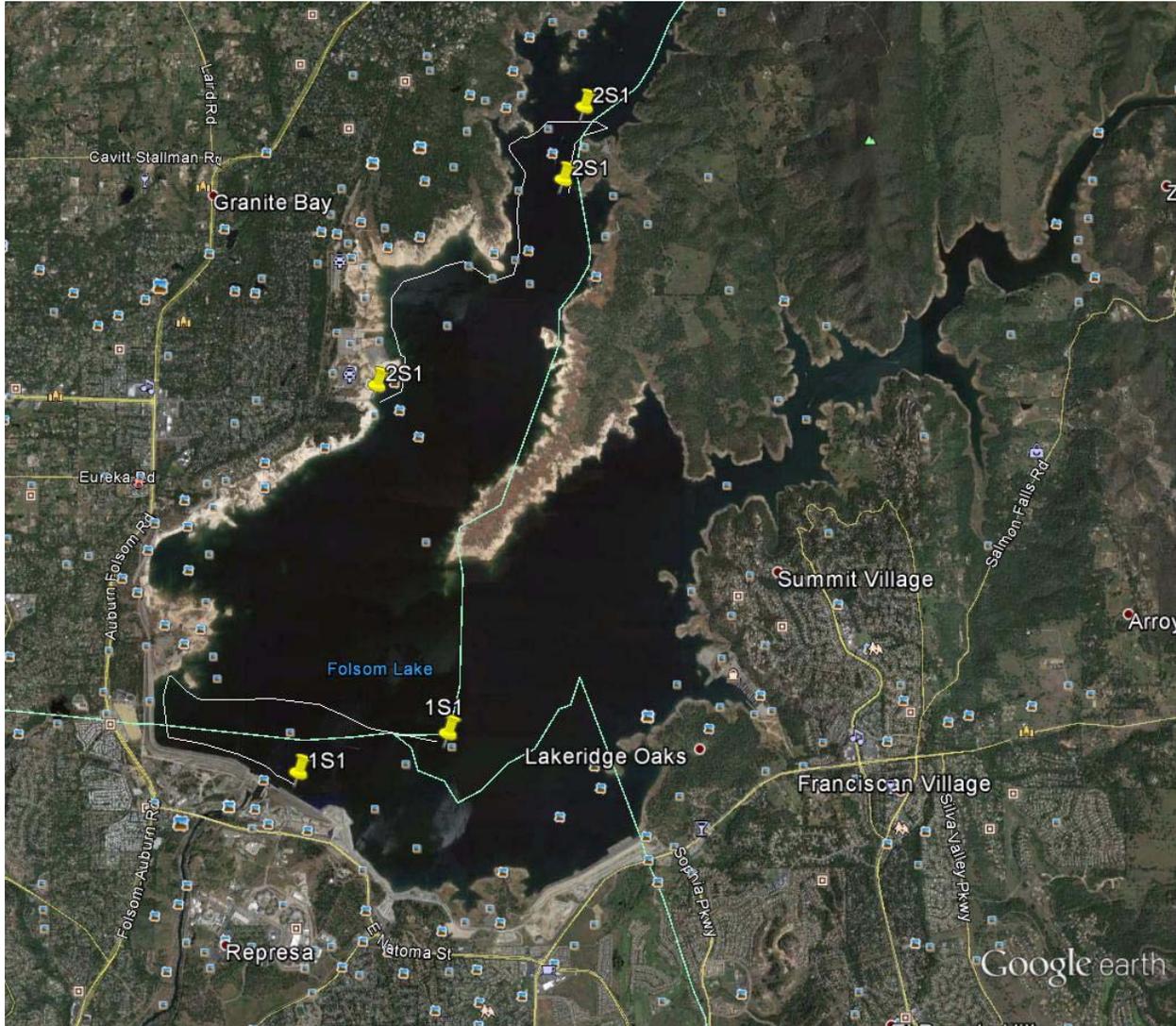
Location 2, Sportfish Caught: Largemouth Bass, TL (mm)										
205	225	251	278	300	375	340	355	395	430	465

Location 3, Sportfish Caught: Largemouth, TL (mm)										
220	242	255	292	305	310	306	315	350	356	420

Comments: Due to low water 3 of the 4 locations were sampled. For Location 1, the sampling vessel was launched from the Putah Canyon Recreation Area boat ramp. For Location 2, the sampling vessel was launched from the BLM Headquarter's boat ramp. For Location 3, the sampling vessel was launched from the Steele Canyon Recreation Area boat ramp. Largemouth bass samples were collected at the 3 locations. Three samples of prey fish species were also collected. Channel catfish and carp were seen.

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2015 BOG, Folsom Lake (514PFL177)



Latitude: 38.71077

Longitude: -121.15511

Collection Method: Electrofisher boat

Date (s) of Collection: August 17, 2015

Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: Bluegill, TL (mm)									
66	67	69	72	75	80	85	86	86	93

Prey Fish Caught: Smallmouth Bass, TL (mm)									
47	47	51	52	57	58	61	62	72	90

Prey Fish Caught: Threadfin Shad, TL (mm)									
28	31	31	32	32	33	35	36	36	39

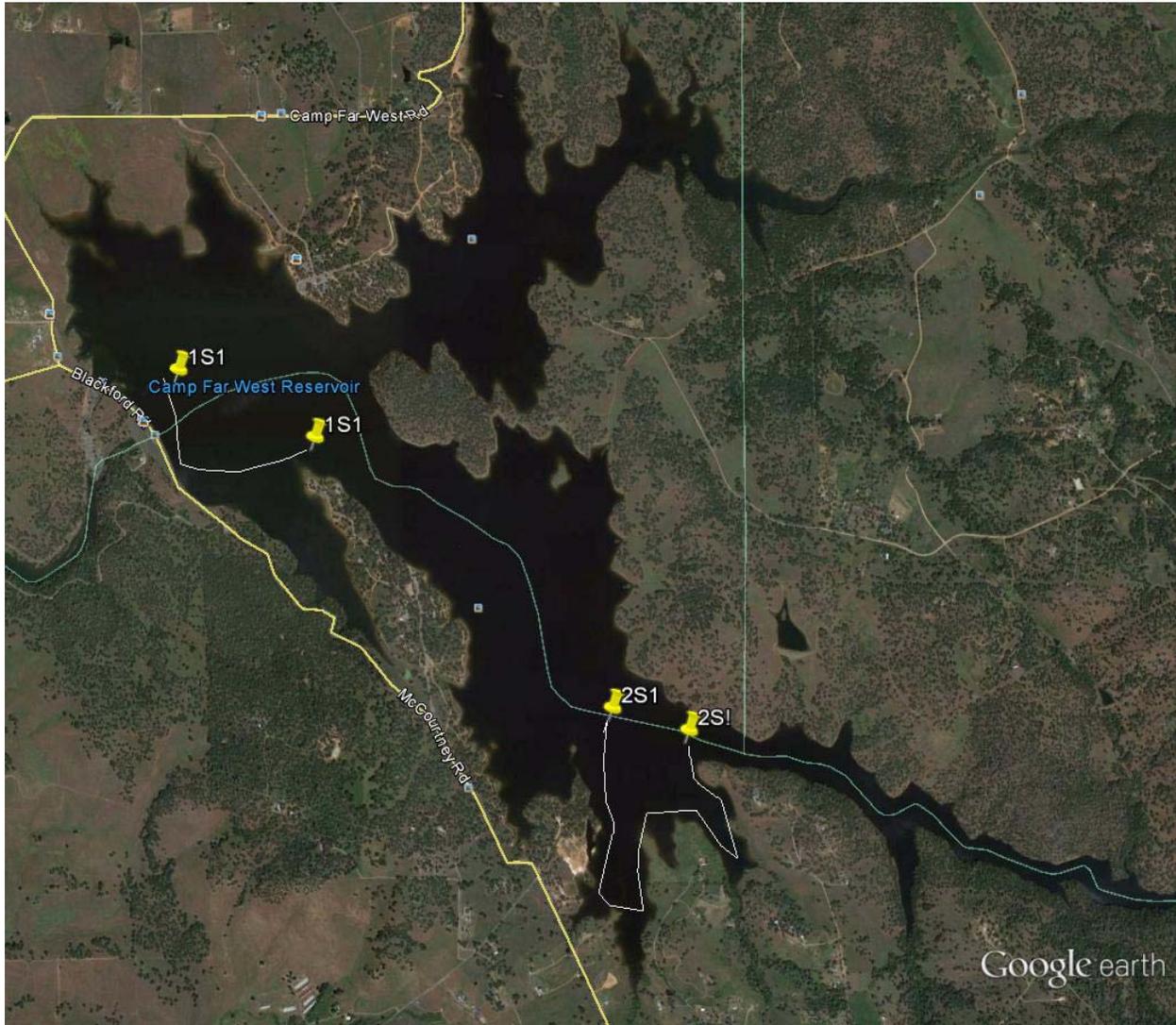
Location 1, Sportfish Caught: Smallmouth Bass, TL (mm)										
210	231	274	285	359	377	363	404	391	369	427

Location 2, Sportfish Caught: Smallmouth Bass, TL (mm)										
211	246	253	279	294	306	305	339	352	345	495

Comments: The sampling vessel was launched from the only lake ramp open. The following week no boat launching was possible. Due to low water only 2 of the 3 locations were sampled. Smallmouth bass samples were collected at the 2 locations. Three species of prey fish were also collected. Channel catfish and carp were seen.

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2015 BOG, Camp Far West Reservoir (516PCF037)



Latitude: 39.05240

Longitude: -121.31480

Collection Method: Electrofisher boat

Date (s) of Collection: August 25, 2015

Samplers: Gary Ichikawa and Jon Goetzl

Prey Fish Caught: Bluegill, TL (mm)									
84	90	91	92	95	98	98	98	99	104

Prey Fish Caught: Smallmouth Bass, TL (mm)									
60	61	61	62	62	65	69	70	75	77

Prey Fish Caught: Threadfin Shad, TL (mm)									
80	82	85	85	85	85	85	88	90	95

Location 1, Sportfish Caught: Smallmouth Bass, TL (mm)										
208	245	252	280	355	325	355	405	385	365	420

Location 2, Sportfish Caught: Smallmouth Bass, TL (mm)										
210	221	264	301	308	308	365	340	314	345	395

Comments: Due to low water the north lake ramp was the only one open. Smallmouth bass samples were collected at the 2 locations. Three samples of prey fish species were also collected. Channel catfish, Sacramento sucker and carp were seen.

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2015 BOG, Zayak/Swan Lake (516TUO173)



Latitude: 39.13540

Longitude: -121.13495

Collection Method: Electrofisher boat

Date (s) of Collection: August 25, 2015

Samplers: Gary Ichikawa and Jon Goetzl

Prey Fish Caught: Bluegill, TL (mm)									
43	52	55	55	65	78	86	87	87	90

Prey Fish Caught: Largemouth Bass, TL (mm)									
58	78	80	80	83	83	85	85	88	90

Sportfish Caught: Largemouth Bass, TL (mm)										
200	235	270	255	320	325	351	378	345	362	382

Comments: This is a private lake and permission to collect was granted by the Lakewood Lake HOA. A sample of largemouth bass was collected in addition to 2 samples of prey fish species. Channel catfish and redear sunfish were seen.

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2015 BOG, Butt Valley Reservoir (518PBV109)



Latitude: 41.16014

Longitude: -121.17789

Collection Method: Electrofisher boat

Date (s) of Collection: October 6, 2015

Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: silverside, TL (mm)									
55	58	59	60	60	60	62	68	73	77

Prey Fish Caught: Smallmouth Bass, TL (mm)									
61	62	63	81	81	91	92	94	96	98

Sportfish Caught: Smallmouth Bass, TL (mm)										
223	228	270	270	280	317	310	325	370	385	411

Comments: The boat was launched from the Ray Adams boat ramp within the state park. 4X4 was necessary to launch/retrieve the boat. Due to low water 1 of the 2 locations were sampled. A sample of smallmouth bass samples was collected in addition to 2 samples of prey fish species. Channel catfish Sacramento sucker, Sacramento pike minnow and carp were seen.

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2015 BOG, Lake Britton (526PLB101)



Latitude: 41.902778
Longitude: -121.65687
Collection Method: Electrofisher boat
Date (s) of Collection: September 23, 2015
Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: Bluegill, TL (mm)									
52	54	54	55	56	57	65	66	67	82

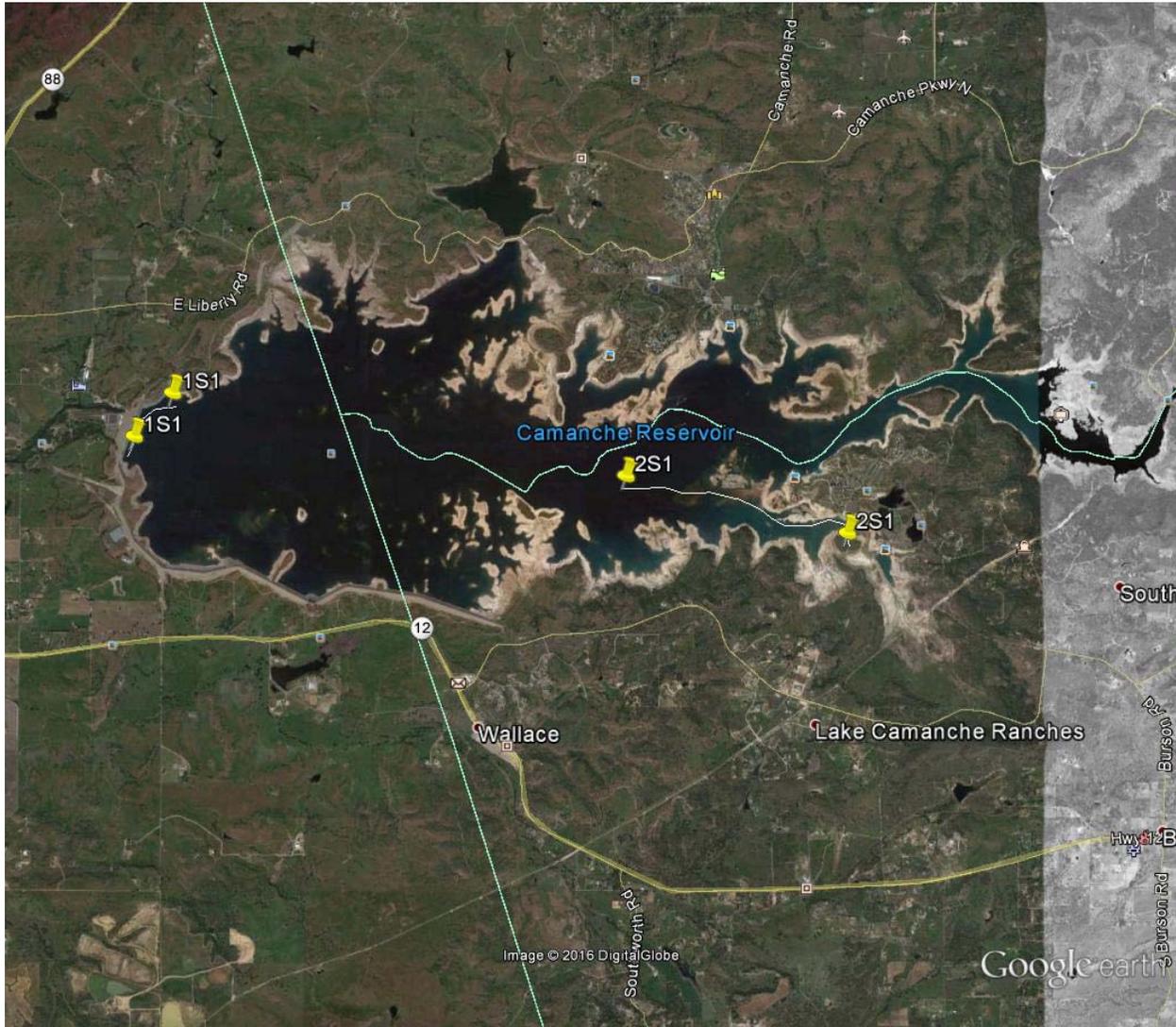
Prey Fish Caught: Smallmouth Bass, TL (mm)									
84	84	87	90	90	92	93	93	94	100

Sportfish Caught: Smallmouth Bass, TL (mm)										
225	230	254	282	348	338	335	344	308	349	403

Comments: The boat was launched from public boat ramp within the state park. Due extremely low water, launching/retrieving the boat was very challenging. A sample of smallmouth bass was collected in addition to 2 prey fish species. Black crappie, brown bullhead, hardhead and carp were seen.

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2015 BOG, Camanche Reservoir (531PCR145)



Latitude: 38.22645
Longitude: -121.01792
Collection Method: Electrofisher boat
Date (s) of Collection: July 28, 2015
Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: Bluegill, TL (mm)									
84	85	86	86	90	90	92	97	97	98

Prey Fish Caught: Green Sunfish, TL (mm)									
67	74	75	75	79	79	87	88	88	93

Prey Fish Caught: Largemouth Bass, TL (mm)									
51	62	65	67	70	70	74	74	75	80

Prey Fish Caught: Threadfin Shad, TL (mm)									
64	69	77	78	83	88	92	92	93	93

Location 1, Sportfish Caught: Largemouth Bass, TL (mm)										
202	240	266	293	330	366	371	369	372	390	450

Location 2, Sportfish Caught: Largemouth Bass, TL (mm)									
242	233	291	365	370	400	416	361	433	431

Comments: The sampling vessel was launched from the only accessible boat ramp. Due to low water only 2 of the 3 locations were sampled. Largemouth bass samples were collected at the 2 locations. Four species of prey fish were also collected. Channel catfish and carp were seen.

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2015 BOG, New Melones Reservoir (534PNM092)



Latitude: 37.95070

Longitude: -120.52214

Collection Method: Electrofisher boat

Date (s) of Collection: July 27, 2015

Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: Bluegill, TL (mm)									
60	71	75	75	75	90	90	95	96	98

Prey Fish Caught: Largemouth Bass, TL (mm)									
44	51	54	57	62	66	66	89	100	103

Prey Fish Caught: Threadfin Shad, TL (mm)									
90	94	95	96	96	97	99	99	99	99

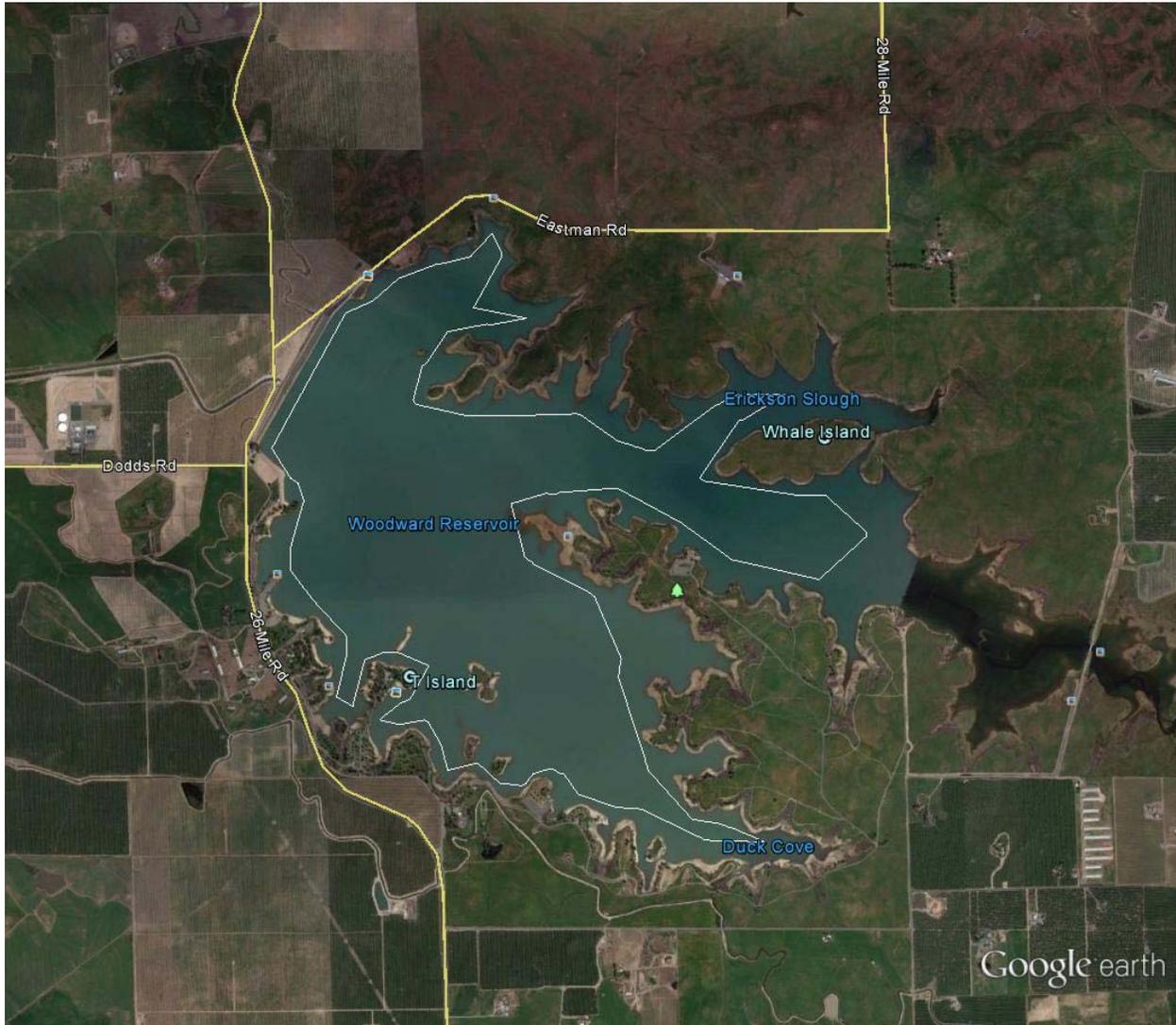
Location 1, Sportfish Caught: Largemouth Bass, TL (mm)										
241	246	252	253	270	301	332	310	382	396	472

Location 2, Sportfish Caught: Largemouth Bass, TL (mm)										
239	236	250	270	353	330	309	352	390	408	377

Comments: The sampling vessel was launched from the only ramp accessible. Largemouth bass samples were collected at 2 locations. Three species of prey fish were also collected. Low water levels and high winds made sampling more difficult. Channel catfish and carp were seen.

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2015 BOG, Woodward Reservoir (535PWR185)



Latitude: 37.8646

Longitude: -120.87369

Collection Method: Electrofisher boat

Date (s) of Collection: July 29, 2015

Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: Bluegill, TL (mm)									
71	71	81	81	85	85	86	87	97	99

Prey Fish Caught: Largemouth Bass, TL (mm)									
51	53	54	55	59	61	63	63	63	70

Prey Fish Caught: Threadfin Shad, TL (mm)									
55	56	56	57	58	59	60	61	61	61

Sportfish Caught: Largemouth Bass, TL (mm)										
158	280	276	295	319	312	313	318	373	391	562

Comments: The sampling vessel was launched from the main launch ramp. Due to low water only 1 of the 2 locations was sampled. Largemouth bass samples were collected as well as 3 species of prey fish. Gold fish, black crappie, brown bullhead and carp were seen.

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2015 BOG Lakes, Don Pedro Reservoir (536PDP167)



Latitude: 37.73278
Longitude: -120.37561
Collection Method: Electrofisher boat
Date (s) of Collection: July 22, 2015
Samplers: Gary Ichikawa and Jon Goetzl

Prey Fish Caught: Largemouth Bass, TL (mm)									
42	46	55	59	59	61	72	75	82	98

Prey Fish Caught: Threadfin Shad, TL (mm)									
77	80	84	85	86	88	90	92	93	94

Location 1, Sportfish Caught: Largemouth Bass, TL (mm)								
207	222	232	223	235	330	332	375	550

Location 2, Sportfish Caught: Largemouth Bass, TL (mm)									
211	225	265	257	325	339	353	360	406	530

Comments: The sampling vessel was launched from the one remaining open boat ramp. Two of the three locations were sampled due to low water levels. Largemouth bass were collected at both locations. Two prey fish species were also collected. Channel catfish, bluegill and carp were seen.

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2015 BOG Lakes, McSwain Reservoir (537PLM116)



Latitude: 37.51742

Longitude: -120.29930

Collection Method: Electrofisher boat

Date (s) of Collection: July 23, 2015 and October 13, 2015

Samplers: Billy Jakl and Sean Mundell, Gary Ichikawa and Jon Goetzl

Prey Fish Caught: Green Sunfish, TL (mm)									
61	64	65	65	67	71	72	78	80	97

Prey Fish Caught: Smallmouth Bass, TL (mm)									
63	65	67	69	82	83	88	89	90	94

Prey Fish Caught: Threadfin Shad, TL (mm)									
50	51	52	55	55	55	55	57	59	62

Sportfish Caught: Smallmouth Bass, TL (mm)										
230	235	270	288	288	286	290	328	315	315	430

Comments: The sampling vessel was launched from the main boat ramp. The initial sampling had to be cancelled due to boat problems. The second sampling was successful. Smallmouth bass were collected in addition to 3 samples of prey fish species. Sacramento sucker were seen.

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2015 BOG Lakes, Lake McClure (537PLM215)



Latitude: 37.66411

Longitude: -120.23753

Collection Method: Electrofisher boat

Date (s) of Collection: July 21, 2015

Samplers: Gary Ichikawa and Jon Goetzl

Prey Fish Caught: Bluegill, TL (mm)									
52	52	59	85	91	95	96	97	97	98

Prey Fish Caught: Largemouth Bass, TL (mm)									
46	51	54	54	55	57	69	70	80	92

Prey Fish Caught: Threadfin Shad, TL (mm)									
59	61	69	71	71	71	71	71	72	75

Location 1, Sportfish Caught: Largemouth Bass, TL (mm)										
220	230	259	262	297	295	330	348	371	390	422

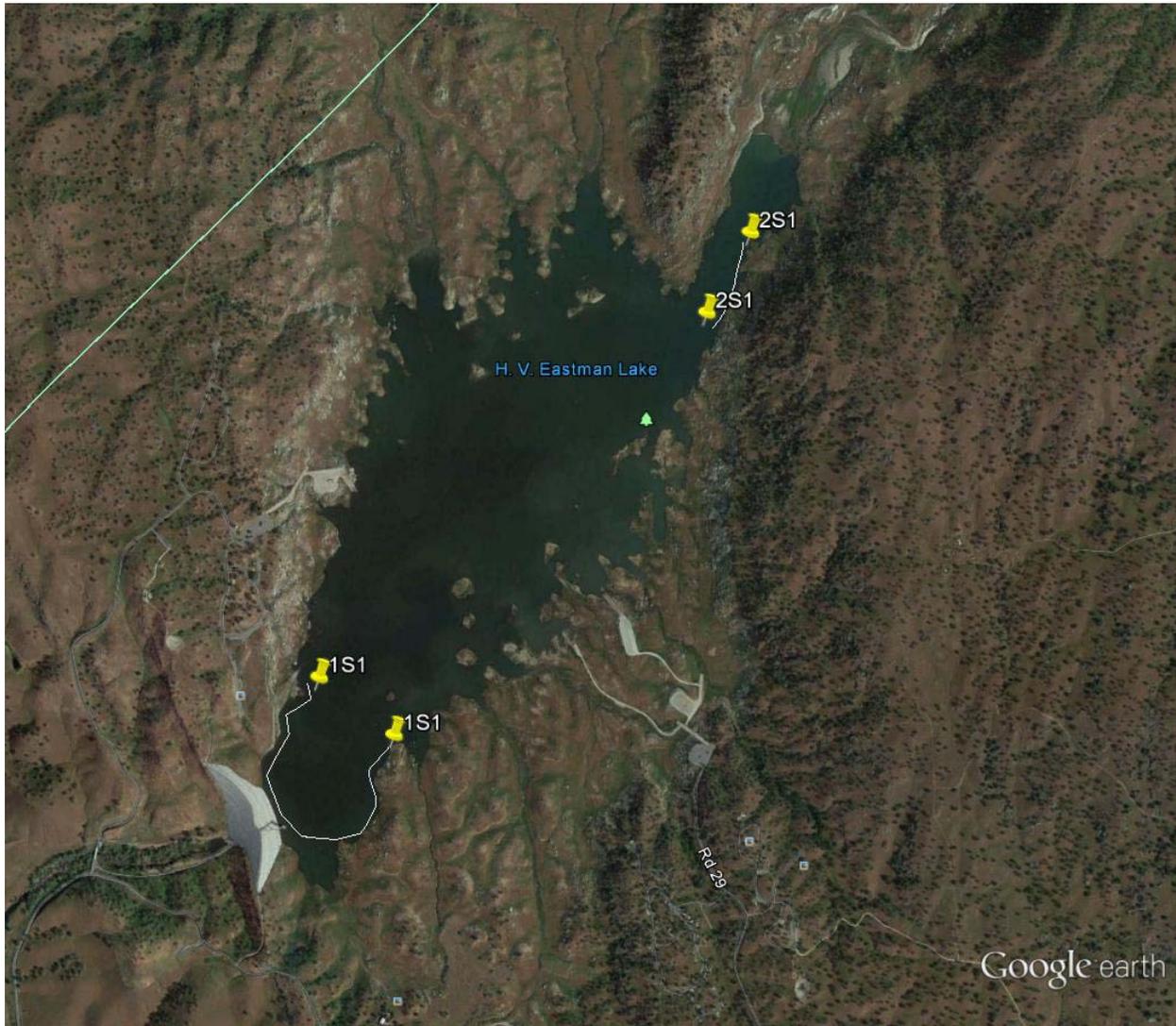
Location 2, Sportfish Caught: Largemouth Bass, TL (mm)										
233	220	242	271	272	310	335	371	371	425	428

Location 3, Sportfish Caught: Largemouth Bass, TL (mm)										
209	235	255	257	280	332	355	400	432	406	432

Comments: The sampling vessel was launched from the one remaining open boat ramp. Three locations were sampled. Largemouth bass were collected at each location. Three prey fish species were also collected.

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2015 BOG, Eastman Lake (539PEL194)



Latitude: 37.22107

Longitude: -119.98248

Collection Method: Electrofisher boat

Date (s) of Collection: August 19, 2015

Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: Bluegill, TL (mm)									
79	84	84	88	88	89	90	92	95	97

Prey Fish Caught: Largemouth Bass, TL (mm)									
51	57	63	63	66	68	70	71	72	78

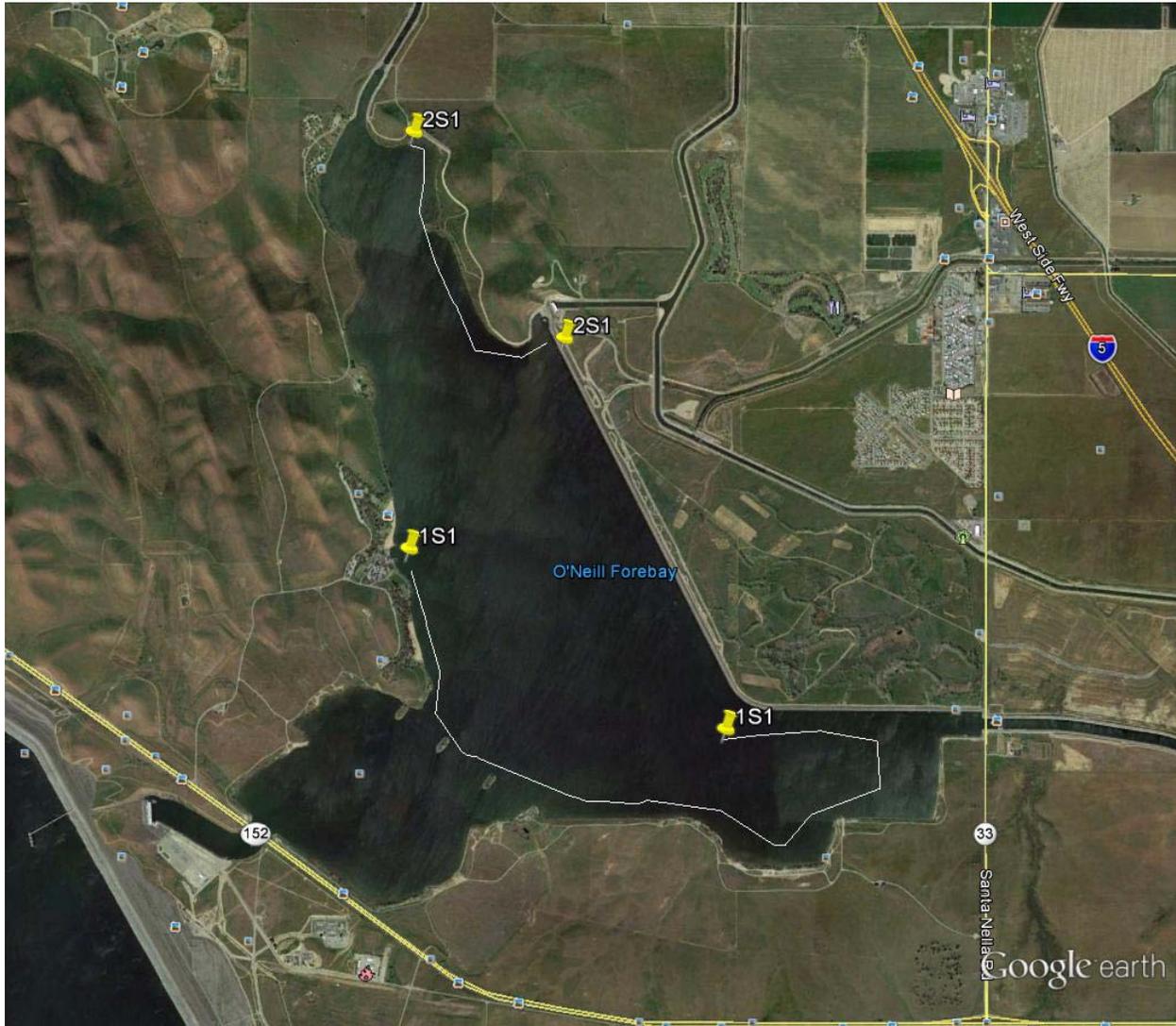
Location 1, Sportfish Caught: Largemouth Bass, TL (mm)										
211	214	225	265	305	324	350	376	393	362	408

Location 2, Sportfish Caught: Largemouth Bass, TL (mm)										
205	247	300	297	325	328	377	400	387	384	426

Comments: The sampling vessel was launched from the main boat ramp. Largemouth bass samples were collected at the 2 locations. Two species of prey fish were also collected. Channel catfish, redear sunfish, black crappie and carp were seen.

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2015 BOG, O'Neill Forebay (541POF104)



Latitude: 37.08366

Longitude: -121.05870

Collection Method: Electrofisher boat

Date (s) of Collection: July 14, 2015

Samplers: Billy Jakl and Sean Mundell

Prey Fish Caught: Bluegill, TL (mm)									
68	82	83	85	85	85	89	95	96	100

Prey Fish Caught: Largemouth Bass, TL (mm)									
65	65	68	69	73	75	80	83	84	85

Prey Fish Caught: Silverside, TL (mm)									
50	51	52	52	53	55	55	55	60	60

Location 1, Sportfish Caught: Largemouth Bass, TL (mm)										
222	238	260	255	365	368	357	395	392	375	430

Location 1, Sportfish Caught: Carp, TL (mm)				
370	360	375	405	440

Location 2, Sportfish Caught: Largemouth Bass, TL (mm)										
205	225	251	278	300	375	340	355	395	430	465

Location 1, Sportfish Caught: Carp, TL (mm)				
335	395	404	415	440

Comments: The sampling vessel was launched from the main reservoir ramp. Fish were collected from 2 locations. Both largemouth bass and carp were collected. Three samples of prey fish species were additionally collected. Sacramento suckers, striped bass, brown bullhead and sculpin were seen.

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2015 BOG, Other Lake 164 (545TUO164)



Latitude: 36.06397

Longitude: -118.92144

Collection Method: Electrofisher boat

Date (s) of Collection: September 16, 2015

Samplers: Scot Lucas and John Negrey

Comments: Due to low water access, to this water body was not available. We will try and sample in 2016.

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2015 BOG, Lake Success (555PSL174)



Latitude: 36.06397
Longitude: -118.92144
Collection Method: Electrofisher boat
Date (s) of Collection: September 15, 2015
Samplers: Scot Lucas and John Negrey

Prey Fish Caught: Channel Catfish, TL (mm)									
64	64	66	69	75	81	81	83	86	87

Prey Fish Caught: Green Sunfish, TL (mm)									
50	52	59	61	62	62	69	78	89	90

Prey Fish Caught: Largemouth Bass, TL (mm)									
58	63	64	64	64	69	72	72	80	94

Sportfish Caught: Largemouth Bass, TL (mm)										
244	243	250	276	320	335	315	391	376	397	496

Comments: The sampling vessel was launched from the bank of the lake. Due to low water 1 of the 3 locations were sampled. Largemouth bass samples were collected in addition to 3 samples of prey fish species. Channel catfish and carp were seen.

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2015 BOG, Brite Valley Lake (556PBV122)



Latitude: 35.10754

Longitude: -118.54556

Collection Method: Electrofisher boat

Date (s) of Collection: September 14, 2015

Samplers: Scot Lucas and John Negrey

Prey Fish Caught: Largemouth Bass, TL (mm)									
62	65	67	68	69	73	76	84	84	90

Prey Fish Caught: White Crappie, TL (mm)									
59	61	61	61	61	62	66	66	69	71

Sportfish Caught: Largemouth Bass, TL (mm)										
242	240	275	287	318	339	329	354	330	343	429

Comments: The sampling vessel was launched from the main boat ramp. A sample of largemouth bass was collected in addition to 2 samples of prey fish species. Channel catfish and bluegill were seen.

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2015 BOG, Lake Havasu (714PLH214) (L1)



Latitude: 34.50734

Longitude: -114.36843

Collection Method: Electrofisher boat

Date (s) of Collection: October 19- 21, 2015

Samplers: Gary Ichikawa and Scot Lucas

Prey Fish Caught: Bluegill, TL (mm)									
57	62	64	71	72	73	75	78	80	86

Prey Fish Caught: Largemouth Bass, TL (mm)									
79	81	82	84	89	92	92	96	98	99

Prey Fish Caught: Threadfin Shad, TL (mm)									
86	87	89	90	91	91	92	92	98	99

Location 1, Sportfish Caught: Largemouth Bass, TL (mm)										
214	240	317	355	515	286	303	311	311	395	410

Comments: The boat was launched from the Windsor Beach State Park boat ramp. A sample of largemouth bass samples was collected in addition to 3 samples of prey fish species. Channel catfish, redear sunfish, brown bullhead, Sacramento sucker, gold fish and flathead catfish were seen.

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2015 BOG, Lake Havasu (714PLH214) (L2)



Latitude: 34.46143

Longitude: -114.37344

Collection Method: Electrofisher boat

Date (s) of Collection: October 20, 2015

Samplers: Gary Ichikawa and Scot Lucas

Location 2, Sportfish Caught: Largemouth Bass, TL (mm)										
210	240	256	263	325	339	331	320	395	408	419

Comments: The boat was launched from the Windsor Beach State Park boat ramp. A sample of largemouth bass samples was collected. Channel catfish and redear sunfish were seen.

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2015 BOG, Lake Havasu (714PLH214) (L3)



Latitude: 34.44524

Longitude: -114.37740

Collection Method: Electrofisher boat

Date (s) of Collection: October 21, 2015

Samplers: Gary Ichikawa and Scot Lucas

Location 3, Sportfish Caught: Largemouth Bass, TL (mm)										
245	240	257	285	390	398	364	386	383	465	575

Comments: The boat was launched from the Site 6 boat ramp on Pittsburg Point. A sample of largemouth bass samples was collected. Channel catfish and redear sunfish were seen.

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2015 BOG, Lake Havasu (714PLH214) (L4)



Latitude: 34.29740
Longitude: -114.312122
Collection Method: Electrofisher boat
Date (s) of Collection: October 20, 2015
Samplers: Gary Ichikawa and Scot Lucas

Location 4, Sportfish Caught: Largemouth Bass, TL (mm)										
193	192	214	292	305	320	349	378	400	430	420

Comments: The boat was launched from the Havasu Springs Resort boat ramp. A sample of largemouth bass samples was collected. Black crappie, flathead catfish and tilapia were seen.
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2015 BOG Lakes, Sunbeam Lake (723SNBEAM)



Latitude: 32.78101

Longitude: -115.68123

Collection Method: Electrofisher boat

Date (s) of Collection: July 29, 2015

Samplers: William Jakl and April Guimaraes

Prey Fish Caught: Bluegill, TL (mm)									
70	75	83	85	90	90	95	99	100	100

Prey Fish Caught: Largemouth Bass, TL (mm)									
56	60	60	65	65	66	72	75	80	87

Sportfish Caught: Largemouth Bass, TL (mm)										
223	226	255	274	345	353	348	364	366	416	496

Comments: The sampling vessel was launched from the only launch ramp. A sample of largemouth bass and 2 prey fish species were collected. The whole lake was sampled. Flathead catfish, channel catfish and carp were seen.

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2015 BOG Lakes, Lake San Marcos (904SAMRLK)



Latitude: 33.11378

Longitude: -117.20991

Collection Method: Electrofisher boat

Date (s) of Collection: July 27, 2015

Samplers: Billy Jakl and April Guimaraes

Prey Fish Caught: Bluegill, TL (mm)									
87	92	95	98	99	100	100	100	100	100

Prey Fish Caught: Largemouth Bass, TL (mm)									
55	80	80	91	93	99	100	100	100	105

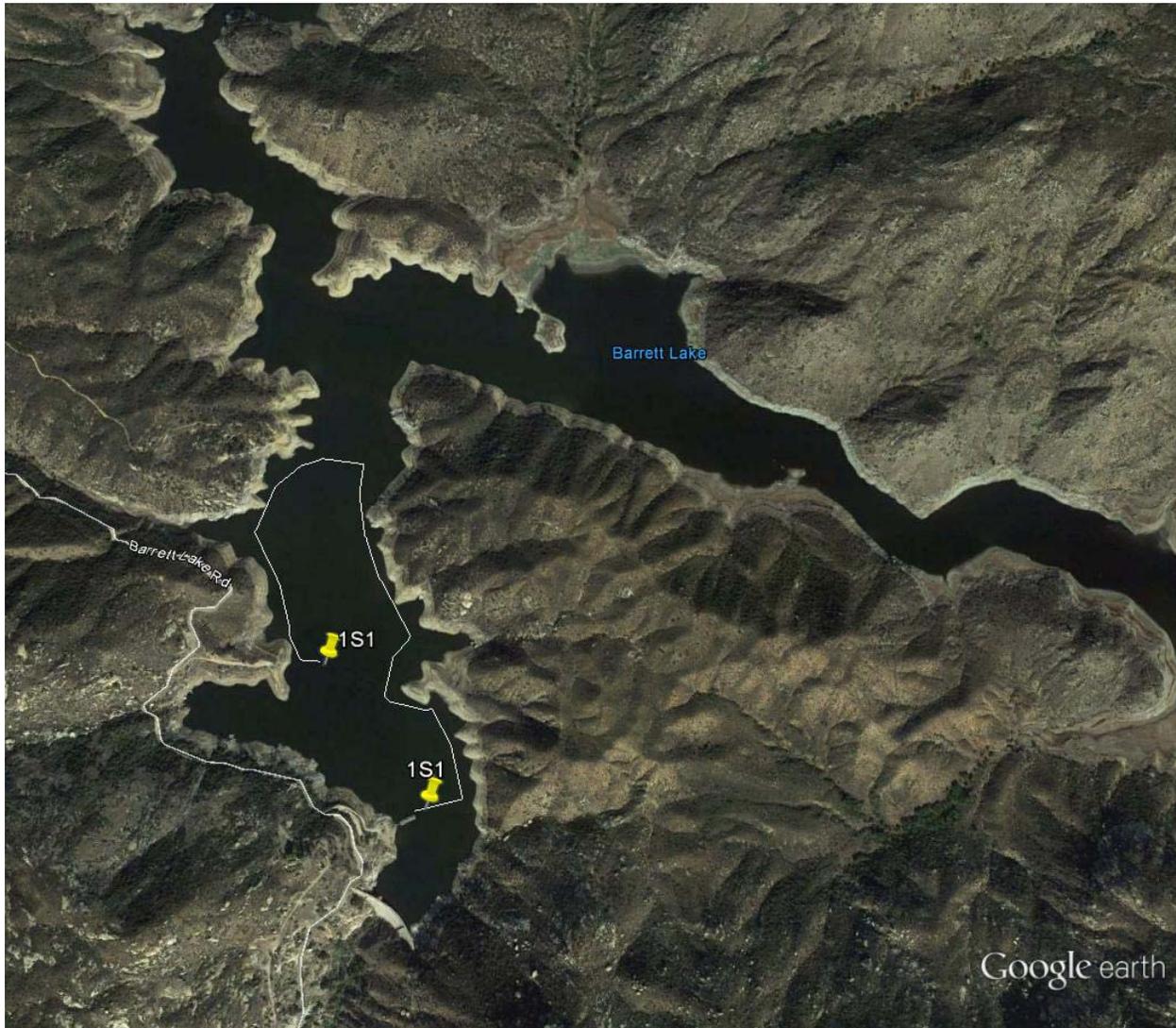
Prey Fish Caught: Threadfin Shad, TL (mm)									
90	92	98	98	99	100	100	100	100	100

Sportfish Caught: Largemouth Bass, TL (mm)										
200	234	251	304	378	390	402	350	397	505	489

Comments: The sampling vessel was launched from the lake resort. A sample of largemouth bass and 3 samples of prey fish species were collected. The entire lake was sampled. Black crappie, bluegill, channel catfish were seen.

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2015 BOG Lakes, Lake Barrett (911PBL166)



Latitude: 32.68125

Longitude: -116.66965

Collection Method: Electrofisher boat

Date (s) of Collection: July 28, 2015

Samplers: Billy Jakl and April Guimaraes

Prey Fish Caught: silverside, TL (mm)									
70	73	80	84	85	89	95	95	95	99

Prey Fish Caught: Threadfin Shad, TL (mm)									
72	72	72	73	73	74	74	74	75	75

Sportfish Caught: Largemouth Bass, TL (mm)										
175	291	292	280	352	360	368	385	360	411	420

Comments: It was not possible to launch a boat. A portable electroshocking unit was utilized on an aluminum skiff. DFW personnel under Russel Black assisted in the fish collections. A sample of largemouth bass and 2 prey fish species were collected. Brown bullhead and bluegill were seen.

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Appendix 1. List of Priority Bass Lakes

Year	Panel	RegBoard	StationNam	Latitude	Longitude	County
Yr1	2	7	Havasu, Lake	34.4025	-114.269	San Bernardino
Yr1	2	4	Crystal Lake	34.3187	-117.847	Los Angeles
Yr1	2	5	New Hogan Lake	38.175	-120.771	Calaveras
Yr1	2	5	Whiskeytown Lake	40.6255	-122.575	Shasta
Yr1	2	9	Skinner	33.58892	-117.053	
Yr1	2	3	Cachuma, Lake	34.59443	-119.943	Santa Barbara
Yr1	2	5	Natomas, Lake	38.6501	-121.194	Sacramento
Yr1	2	2	Upper San Leandro Reservoir	37.7761	-122.117	Alameda, Contra Costa
Yr1	2	4	Wilderness Park Lake	33.9368	-118.1	Los Angeles
Yr1	2	5	Isabella Lake	35.6658	-118.427	Kern
Yr1	2	5	Mile Long Pond	39.42861	-121.634	Butte
Yr1	2	3	Pinto Lake	36.956	-121.773	Santa Cruz
Yr1	2	9	Hodges, Lake	33.06837	-117.114	San Diego
Yr1	2	5	Black Butte Lake	39.7581	-122.379	Tehama, Glenn
Yr1	2	5	Davis Creek Reservoir	38.8591	-122.359	Yolo
Yr1	2	5	Los Banos Reservoir	36.9799	-120.964	Merced
Yr1	2	7	Ferguson Lake	32.972	-114.5	Imperial
Yr1	2	6	Palmdale Lake	34.5506	-118.121	Los Angeles
Yr1	2	5	Pardee Reservoir	38.2659	-120.843	Amador, Calaveras
Yr1	2	1	Iron Gate Reservoir	41.9722	-122.402	Siskiyou
Yr1	2	8	Elsinore, Lake	33.66669	-117.341	Riverside
Yr1	2	5	Webb, Lake	35.2226	-119.262	Kern
Yr1	2	5	Mountain Meadows Reservoir	40.2738	-120.962	Lassen
Yr1	2	2	San Pablo Reservoir	37.923	-122.238	Contra Costa
Yr1	2	4	Magic Johnson Lakes	33.91924	-118.261	
Yr1	2	9	Jennings, Lake	32.8586	-116.886	San Diego
Yr1	2	5	Collins Lake	39.3359	-121.318	Yuba
Yr1	2	3	Chesbro Reservoir	37.1227	-121.709	Santa Clara
Yr1	2	9	Laguna Niguel Park Lake	33.54697	-117.705	Orange
Yr1	2	1	Pillsbury, Lake	39.42739	-122.931	Lake
Yr1	2	2	Nicasio Lake	38.08587	-122.732	Marin
Yr1	2	2	Coyote Lake	37.12078	-121.552	Santa Clara
Yr1	2	9	Sutherland, Lake	33.102	-116.774	San Diego
Yr1	2	6	Silverwood Lake	34.28472	-117.334	San Bernardino
Yr1	2	5	Lake of the Pines	39.0356	-121.063	Nevada
Yr1	2	3	Lopez Lake	35.1973	-120.469	San Luis Obispo
Yr1	2	4	Alondra Park Lake	33.8814	-118.334	Los Angeles
Yr1	2	5	Hensley Lake	37.1272	-119.878	Madera
Yr2	3	5	Oroville, Lake	39.5799	-121.36	Butte
Yr2	3	5	Marsh Creek Reservoir	37.88764	-121.726	Contra Costa

Yr2	3	4	Sepulveda Lake	34.1755	-118.473	Los Angeles
Yr2	3	9	Loveland Reservoir	32.7865	-116.768	San Diego
Yr2	3	5	Blue Lakes	39.175	-123.016	Lake
Yr2	3	2	Lexington Reservoir	37.1735	-121.986	Santa Clara
Yr2	3	4	Lindero, Lake	34.1487	-118.79	Los Angeles
Yr2	3	6	Tahoe, Lake (Tahoe Keys)	39.10241	-120.159	Placer, El Dorado
Yr2	3	1	Reservoir F	41.5564	-120.88	Modoc
Yr2	3	5	Modesto Reservoir	37.6629	-120.654	Stanislaus
Yr2	3	8	Hemet, Lake	33.667	-116.694	Riverside
Yr2	3	4	Pyramid Lake	34.6573	-118.785	Los Angeles
Yr2	3	5	Wildwood, Lake	39.2394	-121.21	Nevada
Yr2	3	3	San Antonio, Lake	35.89164	-121.061	Monterey, San Luis Obispo
Yr2	3	4	Puddingstone Reservoir	34.09028	-117.801	Los Angeles
Yr2	3	5	Bass Lake	37.3133	-119.551	Madera
Yr2	3	5	Scotts Flat Reservoir	39.2767	-120.915	Nevada
Yr2	3	2	Calaveras Reservoir	37.4553	-121.805	Alameda, Santa Clara
Yr2	3	4	Echo Park Lake	34.07362	-118.261	Los Angeles
Yr2	3	9	Sweetwater Reservoir	32.6962	-116.987	San Diego
Yr2	3	1	Sonoma, Lake	38.73935	-123.069	Sonoma
Yr2	3	2	Stevens Creek Reservoir	37.2958	-122.079	Santa Clara
Yr2	3	4	Sherwood, Lake	34.1395	-118.868	Ventura
Yr2	3	5	Slab Creek Reservoir	38.7875	-120.676	El Dorado
Yr2	3	5	Siskiyou Lake	41.2801	-122.338	Siskiyou
Yr2	3	5	Tulloch Reservoir	37.8944	-120.572	Calaveras, Tuolumne
Yr2	3	6	Little Rock Reservoir	34.4811	-118.024	Los Angeles
Yr2	3	5	William Pond (Arden Pond)	38.5839	-121.334	Sacramento
Yr2	3	9	Diamond Valley Reservoir	33.68003	-117.027	
Yr2	3	4	Casitas, Lake	34.38277	-119.36	Ventura
Yr2	3	2	Chabot, Lake (San Leandro)	37.72715	-122.103	Alameda
Yr2	3	4	Legg Lake	34.03584	-118.061	Los Angeles
Yr2	3	5	Thermalito Afterbay	39.4566	-121.658	Butte
Yr2	3	2	Ogier Quarry Ponds	37.183	-121.693	Santa Clara
Yr2	3	5	East Park Reservoir	39.3295	-122.507	Colusa
Yr2	3	2	Henne, Lake	38.5877	-122.462	Napa
Yr2	3	5	San Luis Reservoir	37.0436	-121.071	Merced
Yr2	3	7	Wiest Lake	33.04227	-115.49	Imperial
Yr3	4	6	Arrowhead, Lake	34.2565	-117.185	San Bernardino
Yr3	4	5	Amador, Lake	38.2959	-120.875	Amador
Yr3	4	8	Prado Lake	33.94723	-117.648	San Bernardino
Yr3	4	5	Pine Flat Lake	36.8903	-119.26	Fresno
Yr3	4	2	Lower Crystal Springs Reservoir	37.5313	-122.371	San Mateo
Yr3	4	4	Belvedere Park Lake	34.03501	-118.158	Los Angeles
Yr3	4	5	Antelope Lake	40.1784	-120.595	Plumas

Yr3	4	2	Calero Reservoir	37.1805	-121.787	Santa Clara
Yr3	4	9	O'Neill Lake	33.3292	-117.322	San Diego
Yr3	4	5	Stony Gorge Reservoir	39.5413	-122.522	Glenn
Yr3	4	2	Soulejoule Lake	38.1475	-122.777	Marin
Yr3	4	9	Wohlford, Lake	33.1754	-116.989	San Diego
Yr3	4	4	Castaic Lagoon	34.5061	-118.61	Los Angeles
Yr3	4	5	Combie, Lake	39.0067	-121.043	Nevada, Placer
Yr3	4	4	El Dorado Park Lakes	33.82502	-118.085	Los Angeles
Yr3	4	5	Millerton Lake	37.0097	-119.667	Fresno, Madera
Yr3	4	2	Shadow Cliffs Reservoir	37.6696	-121.836	Alameda
Yr3	4	9	El Capitan	32.8826	-116.792	
Yr3	4	5	Indian Valley Reservoir	39.1135	-122.541	Lake
Yr3	4	2	Almaden Reservoir	37.16245	-121.831	Santa Clara
Yr3	4	4	Malibou Lake	34.1071	-118.758	Los Angeles
Yr3	4	5	Union Valley Reservoir	38.8615	-120.405	El Dorado
Yr3	4	6	Pete's Valley Reservoir	40.5442	-120.452	Lassen
Yr3	4	8	Big Bear Lake	34.26334	-116.944	San Bernardino
Yr3	4	5	Castac Lake	34.8353	-118.843	Kern
Yr3	4	4	Peck Road Water Conservation Park	34.1023	-118.013	Los Angeles
Yr3	4	5	New Bullards Bar Reservoir	39.4282	-121.122	Yuba
Yr3	4	2	Del Valle Reservoir	37.57965	-121.694	Alameda
Yr3	4	9	Morena Reservoir	32.686	-116.537	San Diego
Yr3	4	2	Chabot, Lake (Vallejo)	38.13631	-122.236	Solano
Yr3	4	3	Loch Lomond Reservoir	37.1102	-122.065	Santa Cruz
Yr3	4	4	Hughes, Lake	34.6755	-118.447	Los Angeles
Yr3	4	5	Finnon Reservoir	38.7986	-120.749	El Dorado
Yr3	4	1	Shastina, Lake	41.5203	-122.394	Siskiyou
Yr3	4	7	Gene Wash Reservoir	34.2974	-114.172	San Bernardino
Yr3	4	4	Hansen Dam Lake	34.266	-118.388	Los Angeles
Yr3	4	1	Trinity Lake	41.0532	-122.7	Trinity
Yr3	4	8	Perris Reservoir	33.8535	-117.175	Riverside
Yr4	5	5	San Juan Pond	38.6229	-121.287	Sacramento
Yr4	5	2	Lafayette Reservoir	37.8824	-122.141	Contra Costa
Yr4	5	6	Haiwee Reservoir	36.22799	-117.964	Inyo
Yr4	5	5	Robinson Pond	39.4698	-121.598	Butte
Yr4	5	2	Anderson Lake	37.16611	-121.625	Santa Clara
Yr4	5	9	Miramar Reservoir	32.91573	-117.101	
Yr4	5	1	Mendocino, Lake	39.23517	-123.008	Mendocino
Yr4	5	1	Spring Lake	38.4557	-122.653	Sonoma
Yr4	5	9	Lake Henshaw	33.23756	-116.75	
Yr4	5	6	Gregory, Lake	34.2421	-117.271	San Bernardino
Yr4	5	1	Dead Lake	41.7836	-124.227	Del Norte
Yr4	5	4	Harbor Lake (Machado Lake)	33.78752	-118.293	Los Angeles

Yr4	5	5	Almanor, Lake	40.2289	-121.155	Plumas
Yr4	5	5	Contra Loma Reservoir	37.9744	-121.827	Contra Costa
Yr4	5	9	Murray Reservoir	32.78679	-117.043	
Yr4	5	5	Lower Blue Lake (Lake County)	39.1642	-123	Lake
Yr4	5	3	Uvas Reservoir	37.0757	-121.703	Santa Clara
Yr4	5	4	Calabasas Lake	34.1531	-118.638	Los Angeles
Yr4	5	5	California, Lake	40.3444	-122.201	Tehama
Yr4	5	5	Bethany Reservoir	37.77752	-121.608	
Yr4	5	9	Cuyamaca, Lake	32.98754	-116.582	
Yr4	5	4	Piru, Lake	34.463	-118.75	Ventura
Yr4	5	3	Oso Flaco Lake	35.03054	-120.622	San Luis Obispo
Yr4	5	5	Paradise Lake	39.8584	-121.582	Butte
Yr4	5	5	Los Vaqueros Reservoir	37.8169	-121.738	Contra Costa
Yr4	5	4	Toluca Lake	34.1466	-118.349	Los Angeles
Yr4	5	9	Lower Otay Reservoir	32.6193	-116.916	San Diego
Yr4	5	5	Clear Lake	39.1156	-122.829	Lake
Yr4	5	4	Westlake Lake	34.1425	-118.829	Los Angeles, Ventura
Yr4	5	5	Jenkinson Lake	38.7214	-120.553	El Dorado
Yr4	5	5	Turlock Lake	37.5961	-120.57	Stanislaus
Yr4	5	8	Irvine Lake	33.7684	-117.714	Orange
Yr4	5	5	Rollins Reservoir	39.1546	-120.932	Nevada, Placer
Yr4	5	3	Hernandez Reservoir	36.39302	-120.834	San Benito
Yr4	5	5	Kaweah, Lake	36.4	-118.966	Tulare
Yr4	5	5	Englebright Lake	39.2832	-121.235	Yuba, Nevada
Yr4	5	2	Bon Tempe Lake	37.9558	-122.6	Marin
Yr4	5	4	Lincoln Park Lake	34.06667	-118.202	Los Angeles
Yr5	1	9	Barrett	32.69173	-116.665	
Yr5	1	5	Berryessa, Lake	38.6054	-122.042	Napa
Yr5	1	4	Elizabeth Lake	34.666	-118.403	Los Angeles
Yr5	1	5	New Melones Lake	37.9919	-120.507	Calaveras, Tuolumne
Yr5	1	5	McSwain, Lake	37.5164	-120.295	Mariposa
Yr5	1	5	Beach Lake	38.44068	-121.485	Sacramento
Yr5	1	1	Copco Lake	41.98125	-122.302	Siskiyou
Yr5	1	5	Brite Valley Lake	35.1069	-118.543	Kern
Yr5	1	5	Camp Far West Reservoir	39.0339	-121.283	Yuba, Placer, Nevada
Yr5	1	4	La Mirada Park Lake	33.904	-118.004	Los Angeles
Yr5	1	7	Sunbeam Lake	32.7846	-115.688	Imperial
Yr5	1	5	O'Neill Forebay	37.0762	-121.039	Merced
Yr5	1	5	Camanche Reservoir	38.2186	-120.95	San Joaquin, Amador, Calaveras
Yr5	1	3	Santa Margarita Lake	35.3216	-120.464	San Luis Obispo
Yr5	1	5	Eastman Lake	37.2245	-119.978	Madera, Mariposa
Yr5	1	5	Butt Valley Reservoir	40.1326	-121.166	Plumas
Yr5	1	4	Balboa, Lake	34.1816	-118.495	Los Angeles

Yr5	1	1	Ruth Lake	40.3161	-123.392	Trinity
Yr5	1	5	Woodward Reservoir	37.8558	-120.86	Stanislaus
Yr5	1	5	Zayak/Swan Lake	39.1356	-121.133	Nevada
Yr5	1	3	Nacimiento, Lake	35.75692	-121.005	San Luis Obispo
Yr5	1	4	Cerritos Park Lake	33.8513	-118.061	Los Angeles
Yr5	1	5	545TU0164-BOG Other Lake 164	36.8653	-119.807	Madera
Yr5	1	4	Ken Hahn Park Lake	34.0086	-118.364	Los Angeles
Yr5	1	2	Vasona Reservoir	37.24578	-121.968	Santa Clara
Yr5	1	5	Britton, Lake	41.0202	-121.626	Shasta
Yr5	1	5	Don Pedro Reservoir	37.6981	-120.375	Tuolumne
Yr5	1	4	Castaic Lake	34.5249	-118.599	Los Angeles
Yr5	1	5	Folsom Lake	38.7396	-121.093	Sacramento, Placer, El Dorado
Yr5	1	4	Santa Fe Reservoir	34.1171	-117.955	Los Angeles
Yr5	1	5	Success Lake	36.0791	-118.913	Tulare
Yr5	1	9	San Marcos, Lake	33.12698	-117.204	San Diego
Yr5	1	3	Roberts Lake (Laguna Del Rey)	36.60746	-121.858	Monterey
Yr5	1	5	Shasta Lake	40.8253	-122.398	Shasta
Yr5	1	5	McClure, Lake	37.6624	-120.21	Mariposa