MONTEREY COUNTY WATER RESOURCES AGENCY
BOARD OF DIRECTORS
RESERVOIR OPERATIONS COMMITTEE

COMMITTEE MEMBERS

David Hart, Chair
Ken Ekelund
Richard Ortiz
Mark Nielsen
David Pozzi
Mark Gonzalez

John Baillie
Benny Jefferson
Dean Benedix
Richard Riddle (Parks)
Mark Sandoval (CalParks)

TIME: 1:30 pm
DATE: Thursday October 2, 2014
PLACE: Monterey County Water Resources Agency
Board Room
893 Blanco Circle
Salinas, CA 93901

AGENDA

1. **CALL TO ORDER**

2. **PUBLIC COMMENT**
(Limited to three (3) minutes per speaker on matters within the jurisdiction of the Agency not listed on this agenda. The public will have the opportunity to ask questions and make statements on agenda items as the Committee considers them.)

3. **APPROVE THE MINUTES OF THE RESERVOIR OPERATIONS COMMITTEE MEETING HELD ON SEPTEMBER 4, 2014**
The Committee will consider approval of the minutes of the above-mentioned meeting (Attachment 1).

4. **REVIEW THE STATUS OF BOTH RESERVOIRS; REVIEW RELEASES AND RELEASE SCHEDULE**
Howard Franklin, Senior Water Resources Hydrologist, and Jason Demers, Hydrologist, will present a summary of current conditions at both reservoirs, as well as provide a synopsis of release changes that have occurred since the last meeting (Attachments 2, 2a, 3, 3a, 4). Staff will discuss reservoir inflow and inflow forecasts.

5. **RECEIVE REPORT ON TEMPERATURE AND SNORKEL SURVEYS ON THE ARROYO SECO AND NACIMIENTO RIVERS**

Staff will provide a report on temperature and snorkel survey efforts this summer (Attachments 5 and 6).

6. **RECEIVE REPORT ON DIRECTION FROM MCWRA BOARD OF DIRECTORS (BOD) REGARDING WATER QUALITY SAMPLING AT SAN ANTONIO RESERVOIR**
Staff will provide an update from BOD meeting of September 22nd.

7. **RECEIVE REPORT ON CLOUD-SEEDING**
Staff will report on and discuss possible options for cloud-seeding opportunities.

8. **RECEIVE REPORT REGARDING OPERATIONS AND MAINTENANCE ACTIVITIES AT THE RESERVOIRS**
Brent Buche, Assistant General Manager / Chief of Operations and Maintenance will present a verbal report discussing the various Operations and Maintenance activities at both reservoirs that have occurred over the last month.

9. **RECEIVE REPORTS ON STATUS OF:**
   - **A. LAKE RECREATION BY CONCESSIONAIRE & PARKS DEPARTMENT**
   - **B. EASEMENTS AND AGENCY LEASES**
   - **C. QUAGGA / ZEBRA MUSSEL PLAN**
   - **D. UPDATE ON SLO COUNTY ACTIVITIES**

10. **SET NEXT MEETING DATE AND DISCUSS FUTURE AGENDA ITEMS**
The Committee will discuss and determine details for its next meeting.

11. **ADJOURNMENT**

MONTEREY COUNTY WATER RESOURCES AGENCY
BOARD OF DIRECTORS
RESERVOIR OPERATIONS COMMITTEE

David Hart, Chair
Ken Ekelund
Richard Ortiz
Mark Nielsen
David Pozzi
Mark Gonzalez

John Baillie
Benny Jefferson
San Luis Obispo County Representative
Richard Riddle (Parks)
Mark Sandoval (CalParks)

TIME: 1:30 p.m.
DATE: **Thursday, September 4, 2014**
PLACE: Monterey County Water Resources Agency
Board Room
893 Blanco Circle
Salinas, CA 93901
(831) 755-4860

MINUTES

1. **CALL TO ORDER @ 1:37 p.m. by Chair David Hart.**
Members present: David Hart, Ken Ekelund, Richard Ortiz, John Baillie, Benny Jefferson, Dean Benedix, Mark Sandoval

Members absent: Mark Nielsen, David Pozzi, Mark Gonzalez, Parks Dept. Rep/Richard Riddle

A quorum was established.

2. **PUBLIC COMMENT**
Howard Franklin, Senior Water Resources Hydrologist, introduced Dean Benedix as the interim representative for SLO County.

3. **APPROVE THE MINUTES OF THE RESERVOIR OPERATIONS COMMITTEE MEETING HELD ON JULY 10, 2014**
Committee Action: On motion and second of Committee members Richard Ortiz and Benny Jefferson, the Committee approved the minutes. Members Ken Ekelund, Mark Sandoval, and John Baillie abstained.

4. **REVIEW THE STATUS OF BOTH RESERVOIRS; REVIEW RELEASES AND RELEASE SCHEDULE**

Jason Demers, Hydrologist, provided a status report of reservoir storage and elevation. The current releases total approximately 35 cfs with Nacimiento Reservoir releasing approximately 30 cfs and San Antonio Reservoir releasing approximately 5 cfs.

The Agency has been conducting snorkel surveys on the Nacimiento River and the latest monitoring report will be brought to the Committee in October.

The Committee asked if the 25 - 30 cfs release target at Nacimiento would remain. Staff responded that these flow targets would remain until we began to see winter inflows into the reservoirs.

Brent Buche stated that the Agency is still looking at the possibility of performing maintenance on the outlet valves at San Antonio which would require the reservoir to be at dead pool. If the work is performed this fall we may need to increase release rates in order to ensure the lake elevation reaches dead pool. Prior to performing this maintenance, trash racks would be replaced while lake elevation is above dead pool, as the water would aid in this task because of the weight of the racks.

At the current rate of release, San Antonio is expected to reach dead pool in March 2015, assuming no inflow this winter. Also, assuming no winter inflow and current releases of 25 to 30 cfs, Nacimiento is expected to reach minimum pool in September 2015.

Howard Franklin discussed the most current NOAA Climate Prediction Center's winter forecast. Based on this report we currently expect a 65% chance of "weak" El Nino conditions. Though El Nino conditions "open the door" to the potential for large storm events; statistically, weak El Nino's result in drier than normal winters.

NACIMIENTO elevation is 718.70 feet and 66,285 acre-feet of storage, 18% of capacity, and current release is 30 cfs.

SAN ANTONIO elevation is 650.25 feet and 12,644 acre-feet of storage, 4% of capacity, and current release is 5 cfs.

5. RECEIVE REPORT ON CLOUD-SEEDING

Staff reported that the Agency is evaluating the use of cloud-seeding reserve funds to purchase parts necessary for the repair of San Antonio low level outlet works. Staff also noted that the reserve funds were not enough to complete the environmental work that would be required in order to implement a cloud-seeding program.

Dean Benedix, San Luis Obispo County, expressed SLO's interest in joining with the Agency on a cloud seeding project and will recommend that the SLO Board of Supervisors budget funds up to approximately $150,000 for cloud-seeding in the next fiscal year and encouraged the Agency to do the same. The Committee discussed the possibility of a joint effort between Santa Cruz, San Luis Obispo, and Santa Barbara counties.

Committee Action: On motion and second of Committee members Ken Ekelund and Dean Benedix, the Committee unanimously recommends to the Board of Directors to

direct staff to look into the possibility of a cooperative effort with other counties for the funding of a joint cloud-seeding project.

6. **RECEIVE REPORT REGARDING OPERATIONS AND MAINTENANCE ACTIVITIES AT THE RESERVOIRS**

Brent Buche, Assistant General Manager & Chief of Operations and Maintenance, provided an update on operations and maintenance activities at the reservoirs. Obermeyer Hydro Inc. was at Nacimiento recently to evaluate items of concern listed by the DSOD regarding the operation of the Obermeyer gates at Nacimiento. Hydro revenue from the Nacimiento Hydroelectric Plant has been significantly lower than normal as a result of minimum releases from the reservoir and declining reservoir head.

NOAA Fisheries has signed off on the Salinas River Stream Maintenance Demonstration Project. Maintenance location flagging is occurring now and physical work is scheduled to begin on October 1st, once flagged locations are reviewed by a Biologist. The EIR comment period closed last Saturday and no notices of lawsuits have been received. The EIR process was a four year effort totaling approximately $1.4 million.

7. **RECEIVE REPORTS ON STATUS OF:**

A. LAKE RECREATION BY CONCESSIONAIRE & PARKS DEPARTMENT

Mark Sandoval, CalParks, provided a report for the Parks Department as a representative from Parks was not present. Parks has been facing budget crisis and the potential elimination of fourteen positions at the reservoirs by the end of September 2014. Though the efforts of a special committee, which included members of the Board of Supervisors, funds were identified and action was taken by the Supervisors to fund the positions through the end of June 2015.

Tom Shepherd has retired from the Monterey County Parks Department effective September 1st.

CalParks reported that normal annual revenue generated from the operation of both San Antonio and Nacimiento resorts is approximately $4 million for the fiscal year. This fiscal year the total revenue generated from facilities operations this was approximately $2.5.

B. EASEMENTS AND AGENCY LEASES

Chris Keehn, Right-Of-Way Specialist, provided an update to the Committee. The Department of Fish & Wildlife notified the Agency that illegal hunting was observed on Lease 3 at Nacimiento South Shore. The Agency provided permission to Fish and Wildlife to initiate proceedings to prosecute the violator.

Lessees at Nacimiento and San Antonio have paid their fees and the Agency has received approximately $95,000. Implementing seasonal grazing restrictions into future lease agreements was discussed by the Committee.

The Agency recently contacted the military to inquire on the timing of the underground fiber-optic cable installation along Tank Road at Nacimiento. As of this report, there has been no response to our information request.

When the Agency obtained property for constructing Nacimiento Dam and Reservoir, we were granted a patent from the US Government for 1700 acres on the condition that we build a recreational facility at Bee Rock Road. The facility was never built, and as result the Agency lost the 1700 acres, which was later acquired by the Nature Conservancy and was eventually sold. At that time, the Agency was granted a temporary floodage easement to year 2018. Recent efforts by the Agency have resulted in the granting of a permanent floodage easement on this property.

The Committee asked about lease fee reductions as a result of the drought. As stipulated in the Lease Agreements, fee reductions are provided if the Lessee makes improvements on the property.

C. QUAGGA / ZEBRA MUSSEL PLAN

Mark Sandoval, CalParks, provided an update. The inspection program at Nacimiento is still in operation. The north gate has been closed.

Dean Benedix stated he received an email from Mark Nielsen about the inspection program's continued cooperative funding. NWRMAC and SLO County appreciate the efforts by the Agency to keep that program going. SLO will be modifying the resident vessel program to address issues such as including kayaks and canoes in the inspection program, options for late renewals and other minor changes. There are approximately 450 people in the resident vessel program of which 200 are certified screeners. SLO staff will be contacting Agency staff for review of these proposed modifications.

The Committee had questions about State grant funds from the vessel registration program and how those monies would be dispersed. Questions were also asked about who was elected or appointed to the Board or Committee that will determine where the funding would go and how the fund was going to operate. At this time the answers to these questions are still unknown.

The Committee asked if we had received information on portable decontamination stations from committee member Mark Nielsen. Mr. Nielsen was absent from this meeting and no information has yet been provided.

D. UPDATE ON SLO COUNTY ACTIVITIES

Dean Benedix reported on SLO County activities. Leaks have been detected in the Nacimiento Water Project pipeline in an underground crossing below the Nacimiento River about one mile downstream from the dam. Four to six very small leaks on a spiral weld have been detected in a 30-inch diameter steel pipe. SLO is continuing to assess the situation and has spent approximately $0.5 million during the last six weeks. The NWP has been off line since June 2, 2014. SLO hopes to have the project back in service by April 2015. Mr. Benedix also expressed SLO's desire to participate in the Agency's Interlake Tunnel Project.

ADDENDUM ITEM #6: REPORT REGARDING OPERATIONS AND MAINTENANCE ACTIVITIES AT THE RESERVOIRS

Staff was asked to provide information on water quality data collected for Nacimiento and San Antonio Reservoirs. Mr. Buche reported that SLO County performs a drinking water level suite of constituent testing at Nacimiento, including testing for biological pathogens and heavy metals, on a monthly basis. The Agency performs limited sampling at Nacimiento and San Antonio which does not include the testing for the presence of biological pathogens. There was discussion about the need for additional water quality sampling at San Antonio. There was a discussion about increased cooperation between the Agency and SLO in order to eliminate duplication. The Committee requested testing for contaminants which might be a risk to human health.

Committee Action: On motion and second of Committee members John Baillie and Benny Jefferson, the Committee unanimously recommended that the Agency Board of Directors consider providing direction to staff on performing specific water quality sampling in order to identify if conditions exist at San Antonio Reservoir which may pose a risk to human health from biological pathogens.

8. **SET NEXT MEETING DATE AND DISCUSS FUTURE AGENDA ITEMS**
The next meeting is scheduled for Thursday October 2, 2014 at 1:30 PM at the Agency.

9. **ADJOURNMENT BY CHAIR DAVID HART @ 2:52 P.M.**

SUBMITTED BY: TERESA CAMPA

MONTEREY COUNTY WATER RESOURCES AGENCY
BOARD OF DIRECTORS - RESERVOIR OPERATIONS COMMITTEE

MEETING DATE:	October 2, 2014		**AGENDA ITEM:**
AGENDA TITLE:	Reservoir Release Update		
	Consent ( ) **Action ( )** **Information (X)**		
SUBMITTED BY: **PHONE:**	Howard Franklin (831) 755-4860	**PREPARED BY:** **PHONE:**	Jason Demers (831) 755-4860
DEADLINE FOR BOARD ACTION:		October 2, 2014	

RECOMMENDED BOARD ACTION:

None – item presented for informational purposes.

SUMMARY:

The Board of Directors receives monthly updates on the status of Agency reservoirs.

DISCUSSION/ANALYSIS:

RESERVOIR ELEVATION / STORAGE: The following reservoir conditions were recorded on September 23, 2014. San Antonio Reservoir is at an elevation of approximately 649.65 feet mean sea level (msl), 12,341 acre-feet of storage. Nacimiento Reservoir is at elevation 717.8 feet msl, 64,450 acre-feet of storage. San Antonio Reservoir is at 4% of storage capacity and Nacimiento Reservoir is at 17% of capacity.

RESERVOIR RELEASES: As directed by the Agency Board of Directors and in coordination with guidelines provided by the National Marine Fisheries Service; releases from Nacimiento were incrementally decreased to a target flow rate of 25 cfs. Releases from San Antonio Reservoir remain at 5 cfs.

Releases as of September 23, 2014:

- Nacimiento Reservoir: 30 cfs
- San Antonio Reservoir: 5 cfs

Total releases from both reservoirs to the Salinas River are approximately 35 cfs. The following "provisional" flows have been recorded by the USGS:

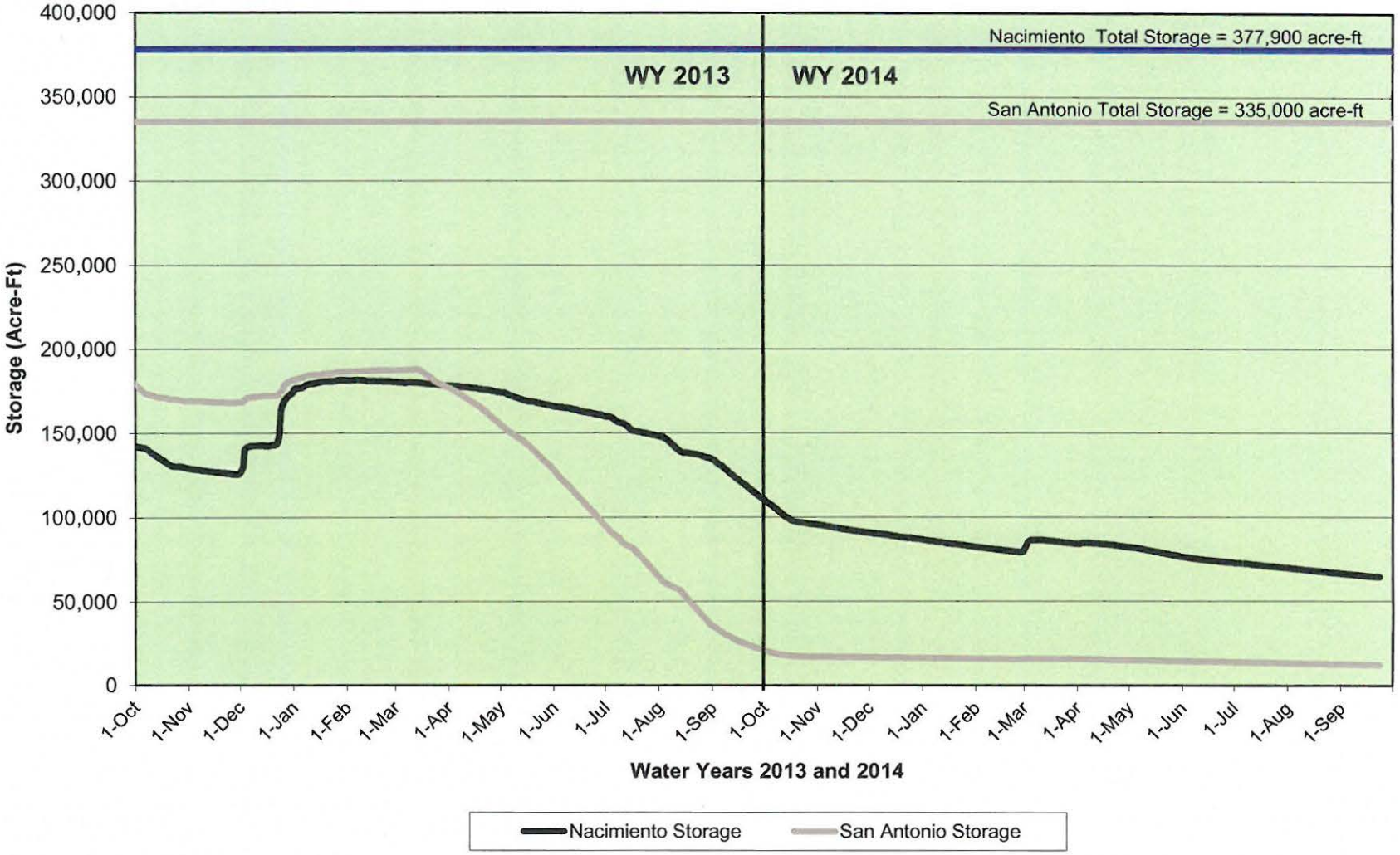
- Salinas River near Spreckels: 0 cfs
- Salinas River near Chualar: 0 cfs
- Salinas River near Soledad: 0 cfs
- Salinas River near Bradley: 30 cfs (steady)

Synopsis of Reservoir Release Changes from
July 3, 2014 to September 24, 2014

	San Antonio Reservoir		Nacimiento Reservoir		
Date	**Starting Flow**	**Ending Flow**	**Starting Flow**	**Ending Flow**	**Total Releases**
July 3, 2014	5	5	26	31**	36
August 2, 2014	5	5	31	26**	31
August 30, 2014	5	5	26	30**	35

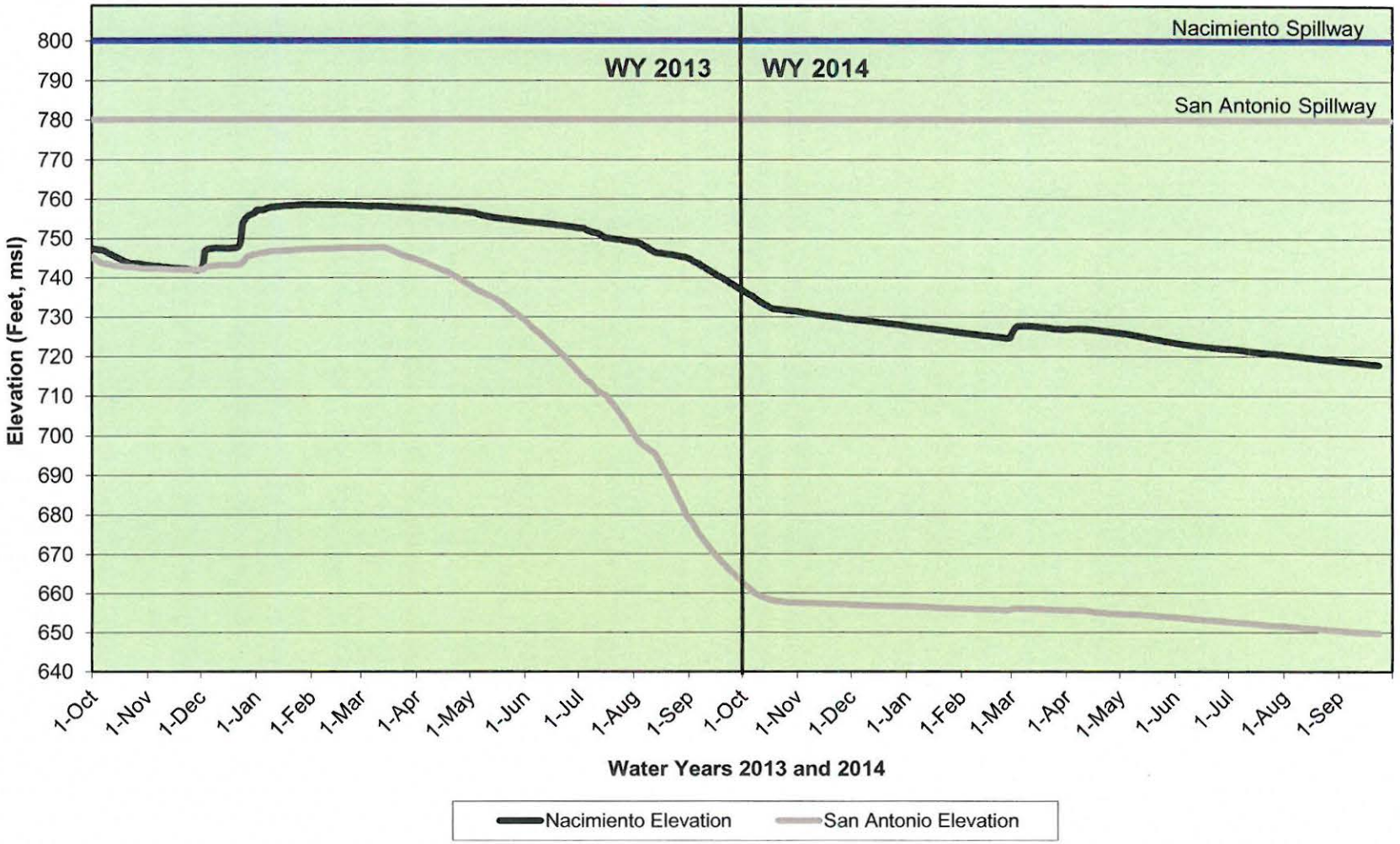
*Release reduction due to head loss.
**Release change in response to USGS gage measurement and flow adjustment.

Reservoir Storage



ATTACHMENT 3

Reservoir Elevation



ATTACHMENT 3a

MONTEREY COUNTY WATER RESOURCES AGENCY

PRELIMINARY - Estimated Elevation/Storage/NWP Diversions after September 1st

9/23/2014

RESERVOIR RELEASE SCHEDULE FOR 2014

			NACIMIENTO							SAN ANTONIO				
	Combined Releases (cfs)*	Combined Releases (ac-ft)	Evap. Losses (ac-ft)**	Reservoir Releases (cfs)*	Reservoir Releases (ac-ft)	NWP Orders (ac-ft)	NWP Diversions (ac-ft)	**Storage** (ac-ft)	**Elev.** (ft)	Evap. Losses (ac-ft)**	Reservoir Releases (cfs)*	Reservoir Releases (ac-ft)	**Storage** (ac-ft)	**Elev.** (ft)
1/1/2014								**86,393**	**727.7**				**16,390**	**656.6**
	70	4,304	237	60	3,689	755	123			68	10	615		
2/1/2014								**82,165**	**725.9**				**15,935**	**655.9**
	70	3,888	300	60	3,332	1,037	86			87	10	555		
3/1/2014								**81,695**	**725.7**				**15,935**	**655.9**
	71	4,346	563	61	3,731	1,033	91			151	10	615		
4/1/2014								**84,200**	**726.8**				**15,675**	**655.5**
	69	4,128	561	60	3,570	1,133	106			154	9	558		
5/1/2014								**82,012**	**725.8**				**15,042**	**654.5**
	65	3,997	1,215	60	3,689	1,165	819			135	5	307		
6/1/2014								**76,288**	**723.5**				**14,600**	**653.8**
	41	2,418	1,198	36	2,120	1,707	100			422	5	298		
7/1/2014								**72,870**	**721.8**				**13,880**	**652.6**
	36	2,188	1,237	31	1,880	1,907	0			638	5	307		
8/1/2014								**69,753**	**720.4**				**13,271**	**651.5**
	31	1,934	1,637	26	1,626	1,966	0			568	5	307		
9/1/2014								**66,490**	**718.8**				**12,669**	**650.3**
	35	2,083	1,289	30	1,785	1,758	TBR			419	5	298		
10/1/2014								**61,658**	**716.4**				**11,953**	**648.9**
	30	1,845	864	25	1,537	1,243	TBR			285	5	307		
11/1/2014								**58,013**	**714.4**				**11,360**	**647.7**
	30	1,785	420	25	1,488	953	TBR			149	5	298		
12/1/2014								**55,153**	**712.9**				**10,914**	**646.8**
	30	1,845	264	25	1,537	744	TBR			90	5	307		
1/1/2015								**52,608**	**711.4**				**10,000**	**645.0**
TOTALS:		**34,759**	**9,784**		**29,986**	**15,403**	**1,325**			**3,166**		**4,772**		

* Mean daily flow for the month in cubic feet per second.

** Evap. Losses estimated from long term pan evaporation data at Nacimiento and San Antonio Reservoirs.

NOTES:

1. Nacimiento Reservoir storage capacity 377,900 acre feet.
2. San Antonio Reservoir storage capacity 335,000 acre feet.
3. Reservoir Operations Committee may make release considerations for fish spawn and holiday periods to benefit recreation.
4. Shaded areas represent periods when elevations are influenced by inflow/runoff; releases may include flood control releases.
5. Preliminary Schedule assumes no inflow to reservoirs after May 1st.
6. "NWP Diversions" are San Luis Obispo County - Nacimiento Water Project conveyance facilities diversions. Max. allowable diversions for water year (Oct. 1 - Sept. 30) are 15,750 ac-ft. To Be Reported (TBR)
7. Nacimiento "NWP Diversions" do not include lakeside water use which is estimated at approximately 1,750 acre feet per year.

ATTACHMENT 4

MONTEREY COUNTY

WATER RESOURCES AGENCY

PO BOX 930
SALINAS , CA 93902
(831)755-4860
FAX (831) 424-7935

DAVID E. CHARDAVOYNE
GENERAL MANAGER

STREET ADDRESS
893 BLANCO CIRCLE
SALINAS, CA 93901-4455

September 2, 2014

Joyce Ambrosius
National Marine Fisheries Service
Protected Resource Division
Southwest Region
777 Sonoma Ave., Room 325
Santa Rosa, CA 95404-4731

Dear Ms. Ambrosius:

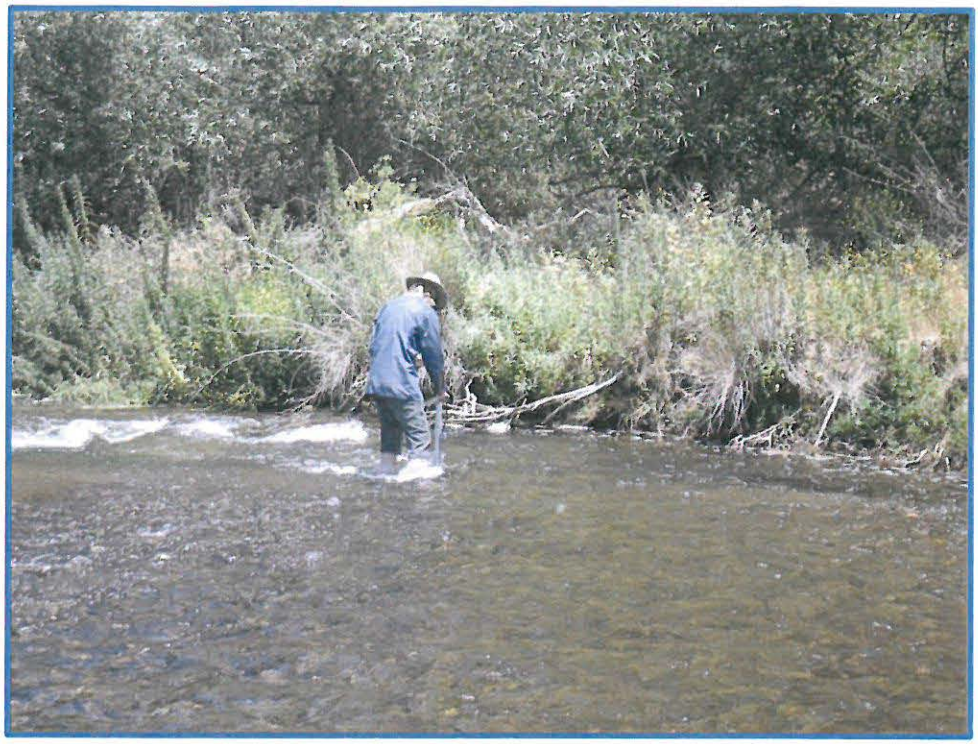
Enclosed is the temperature data for the Nacimiento River below Nacimiento Dam for June, July, and August 2014. This data is being collected as per National Marine Fisheries Services' recommendations for temperature and flow monitoring when Nacimiento River Flows were reduced from 60 cfs (established with implementation of the Salinas Valley Water Project) to the previous minimum release requirement of 25 cfs.

Information is provided on the physical attributes of the deployment locations as well as ambient air temperature and preliminary flow data associated with collected water temperature data. If you have any questions regarding this report please contact me at 831.755.4860 or Clayton Leal at (831) 755-8912.

Sincerely,

Robert Johnson
Assistant General Manager/Chief of Water Resources Planning
Monterey County Water Resources Agency

Nacimiento River Flow Reduction
Temperature Monitoring



Monterey County Water Resources Agency
890 Blanco Circle
Salinas, CA 93902

Updated: August 29, 2014

ATTACHMENT 5

Site 2.5

Location: 35°46'5.76"N 120°50'48.90"W

Site Description: The temperature logger is located approximately 4.46 km (2.77 miles) downstream of the Nacimiento Dam outlet. The monitoring location is located approximately 44 m downstream of the abandoned bridge that connects Perimeter Road and River Road over the Nacimiento River (Figures 1 and 2). The instrument is staked to the left bank at the first riffle downstream of the abandoned bridge. The instrument is positioned in the thalweg of a riffle approximately 2 m downstream of the crest.

Figure 1: Site 2.5 aerial image.

Figure 2: Site 2.5 at 28 cfs.

Habitat Description: The logger is located in a riffle descending from a large pool. The upstream pool is over 80 m in length and has depths that exceed 1.5 m. The logger is in a riffle that spans the entire width of the channel. The thalweg of the channel is located along the left bank (Figure 3). Depth is less than 20 cm for over 50 percent of the channel. At the time of deployment it was sitting on the substrate in

water with an approximate depth of 56 cm. The riffle is less than 10 m in total length, and then joins a short run that spills into another large pool. The canopy cover above the logger is sparse (Figure 4) and majority of the channel upstream of the site is exposed to direct sunlight.

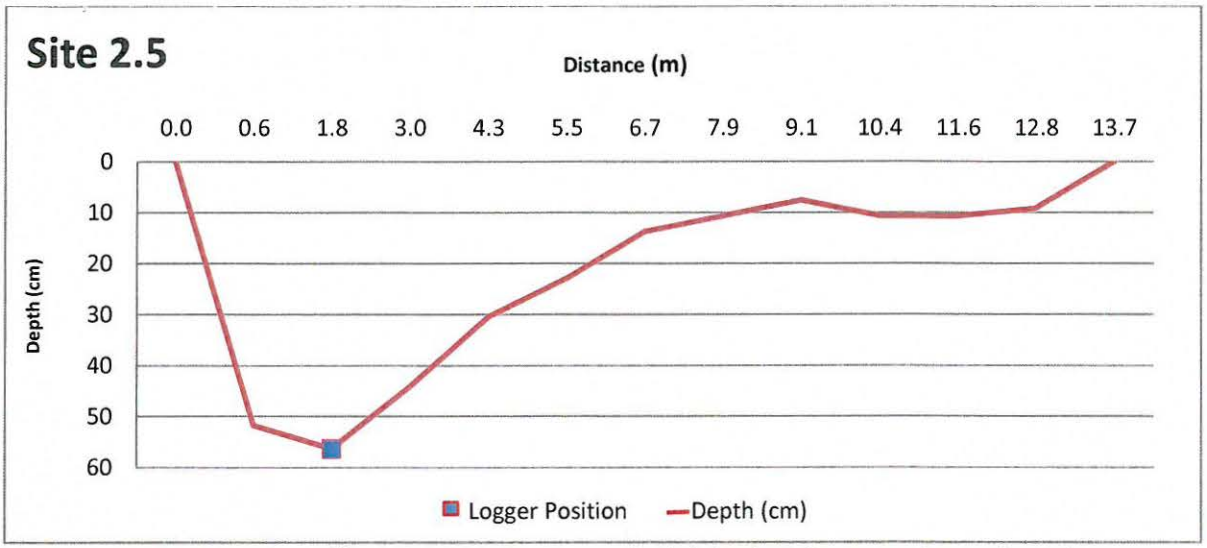


Figure 3: Depth Profile at Site 2.5 starting on the left bank and progressing to the right.

SWAMP Optical Habitat Evaluation (Ode, 2007)

Algae	Very Heavy	**Boulders**	Absent	**Undercuts**	Moderate	**Rootwads**	Absent	**Primary Substrate**	Cobble
Emergent Vegetation	Moderate	**Woody Debris**	Absent	**Overhanging Vegetation**	Sparse	**Artificial Structures**	Absent	**Secondary Substrate**	Gravel

Figure 4: Surface Water Ambient Monitoring Program optical assessment of habitat conditions.

Directions to Site: Enter Camp Roberts through A Street. Take the left fork to California Blvd. Continue down California Blvd and bear right onto Nacimiento Road. Nacimiento Road turns into Perimeter Road near the Range Control Office. Go past Range Control and turn right onto Bee Rock Road and take the bridge over the Nacimiento River. At the Y turn left onto Tower Road. Follow Tower Road through the eagle nesting area, past Avery Road. 1.32 miles past Avery Road, turn left onto unmarked, River Road. Follow River Road for 1.86 miles paralleling the River in a westerly direction. At the 1.86 mile mark there is an unmaintained spur road that leads to the River. The spur road ends at the River. The logger is upstream of the road, but downstream of the abandoned bridge (see the Site Description).

Temperature Data: The water temperature provided below is based on daily mean, minimum, and maximum degrees Celsius, generated from hourly temperature recording from a Hobo U-22 data logger. Flow is provided in daily average cubic feet per second (cfs) generated from quarter hour preliminary data collected at the USGS 11149400 Nacimiento River below Nacimiento dam near Bradley, CA stream flow gage. Temperature is provided in daily average from the MCWRA weather station located near Nacimiento Dam approximately 3.75 km west of Site 2.5. The averages were generated from hourly data in Celsius.

The Hobo U-22 temperature logger was deployed at Site 2.5 on June 5, 2014. Data was collected continuously with downloads occurring on June 17 and 24, July 9 and 25, and August 20. The data represented in Figure 5 includes June 5, 2014 to August 20, 2014. The USGS adjusted preliminary (as of August 27, 2014) flow data based upon field measurements, therefore, they will not match data that was provided in the June and July monitoring reports. The correction does not significantly alter the hydrograph.

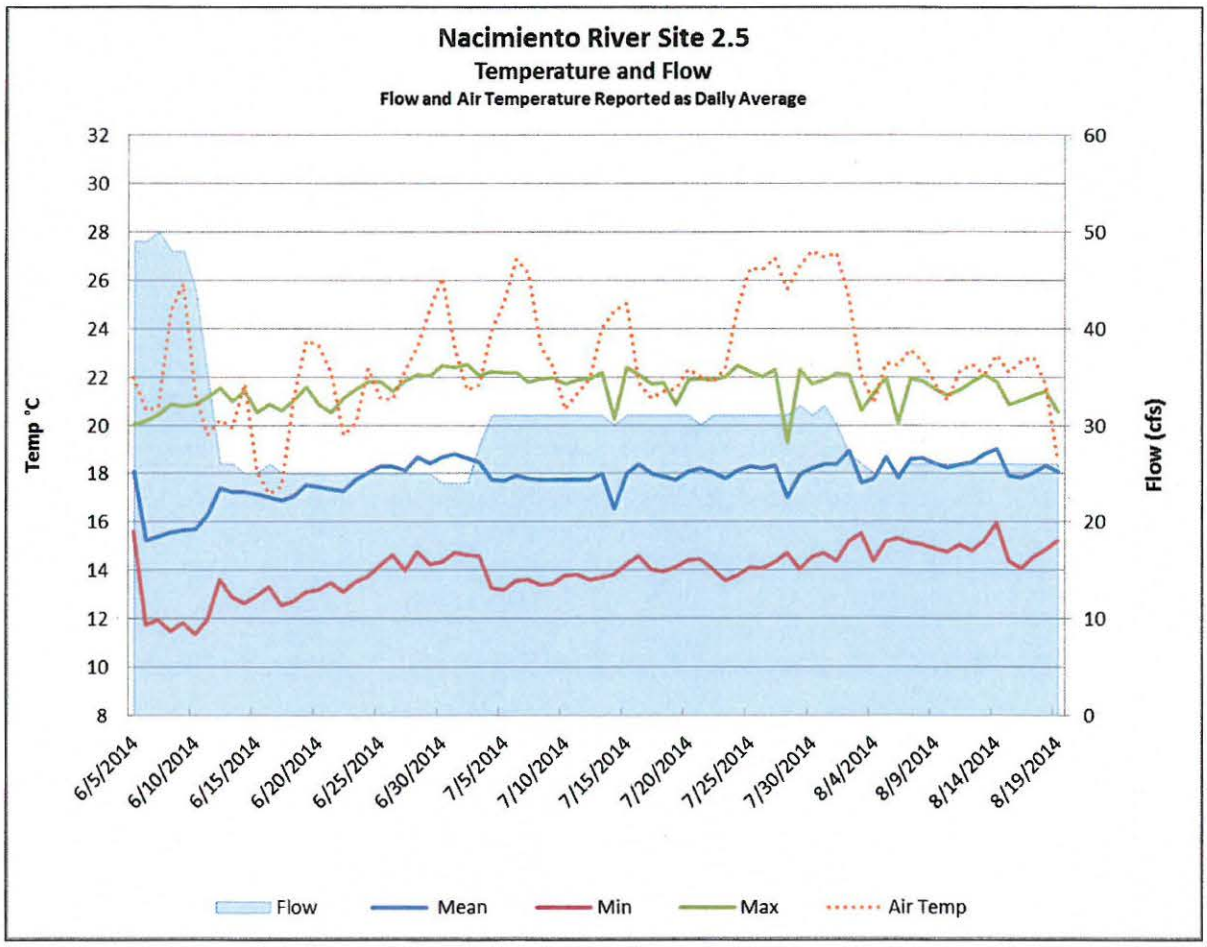


Figure 5: Daily temperature data collected at site 2.5

Site 5

Location: 35°45'15.68"N 120°49'5.21"W

Site Description: The temperature logger is located approximately 8.24 km (5.1 miles) downstream of the Nacimiento Dam outlet. The monitoring location is located is in an expansive reach best classified as a glide, as it lacks depth to meet pool status (Figure 6 and 7). The instrument is staked to the right bank 10 m downstream of a power-line crossing. The cable extends towards the water between two scrub willows with branches that extend into the water. A cluster of three sycamore trees (20 cm DBH) are a good indicator of relative location if power-lines are ever removed. The cabling point is upstream of the three tree cluster. The instrument is positioned in the thalweg of the channel within 2 m of the bank.

Figure 6: Site 5 aerial image.

Figure 7: Site 5 at 28 cfs.

Habitat Description: The logger is located in a habitat best classified as a glide. The habitat up and downstream is uniform, wide, with a right bank dominated thalweg. Areas along the left bank are shallow and have limited canopy cover, and the maximum depth along the right bank (thalweg) is approximately 45 cm (Figure 8). The canopy cover above the logger is sparse, and majority of the channel upstream of the site is exposed to direct sunlight. The reach has a high potential for thermal increase. The habitat is not beneficial to *O. mykiss* (figure 9) as it lacks complexities and has a substrate made primarily of sand with a secondary of silt and mud.

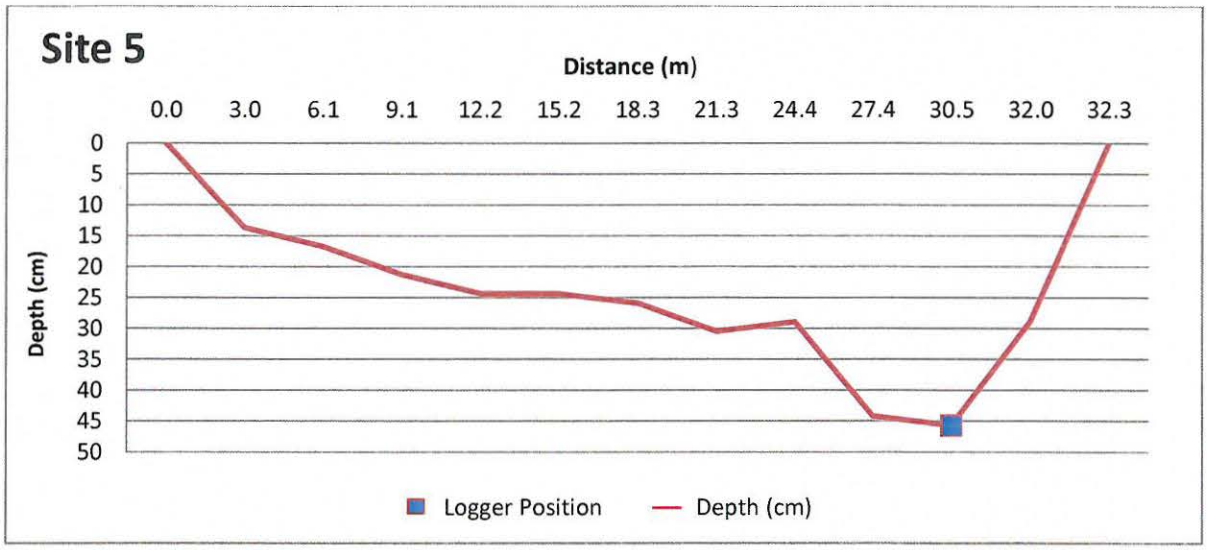


Figure 8: Depth profile at Site 5 starting on the left bank and progressing to the right.

SWAMP Optical Habitat Evaluation (Ode, 2007)

Algae	Heavy	**Boulders**	Absent	**Undercuts**	Moderate	**Rootwads**	Sparse	**Primary Substrate**	Sand
Emergent Vegetation	Moderate	**Woody Debris**	Absent	**Overhanging Vegetation**	Sparse	**Artificial Structures**	Absent	**Secondary Substrate**	Silt/Mud

Figure 9: Surface Water Ambient Monitoring Program optical assessment of habitat conditions.

Directions to Site: Enter Camp Roberts through A Street. Take the left fork to California Blvd. Continue down California Blvd and bear right onto Nacimiento Road. Nacimiento Road turns into Perimeter Road near the Range Control Office. Go past Range Control and turn right onto Bee Rock Road and take the bridge over the Nacimiento River. At the Y turn left onto Tower Road. Follow Tower Road for 2.2 miles through the eagle nesting area, past Avery Road, and turn left onto an unmarked dirt road that heads towards the river. At the time of deployment the area was marked with signs that read environmentally sensitive area. Follow the dirt road down to the water's edge and follow the road upstream parking on the downstream side of the power-lines (figure 2).

Temperature Data: The water temperature provided below is based on daily mean, minimum, and maximum degrees Celsius, generated from hourly temperature recording from a Hobo U-22 data logger. Flow is provided in daily average cubic feet per second (cfs) generated from quarter hour preliminary data collected at the USGS 11149400 Nacimiento River below Nacimiento dam near Bradley, CA stream flow gage. Temperature is provided in daily average from the MCWRA weather station located near Nacimiento Dam approximately 6.36 km west of Site 5. The averages were generated from hourly data in Celsius.

The Hobo U-22 temperature logger deployed to satisfy the Biological Opinion was downloaded. Data was collected continuously with downloads occurring on June 17 and 24, July 9 and 25, and August 20. The data represented in Figure 10 includes June 5, 2014 to August 20, 2014. The USGS adjusted preliminary (as of August 27, 2014) flow data based upon field measurements, therefore, they will not match data that was provided in the June and July monitoring reports. The correction does not significantly alter the hydrograph.

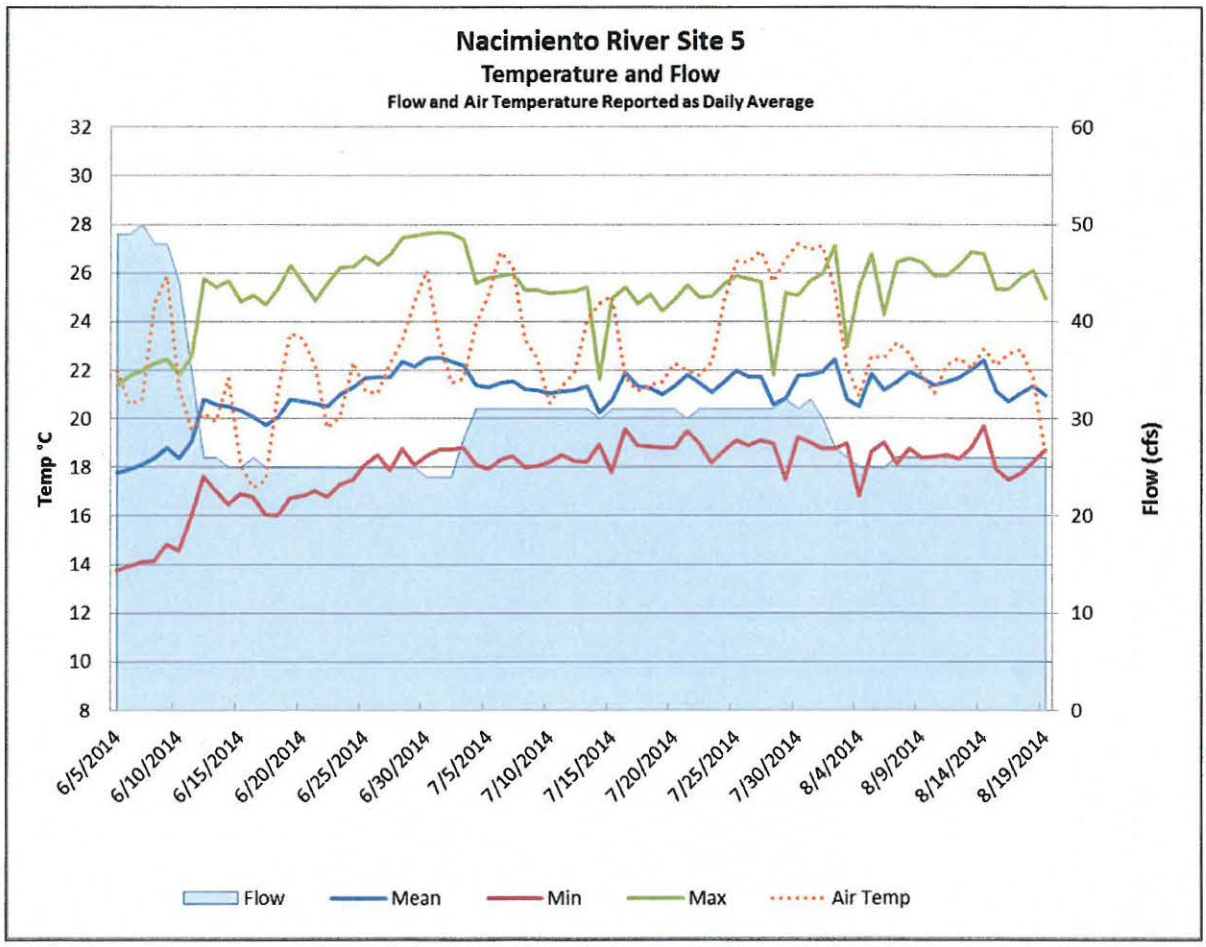


Figure 10: Daily temperature data collected at site 5.

Site 7.5

Location: 35°46'56.11"N 120°47'26.74"W

Site Description: The temperature logger is located approximately 12.5 km (7.74 miles) downstream of the Nacimiento Dam outlet. The monitoring station is located in a riffle habitat upstream of the Bee Rock Road Bridge crossing (Figure 11 and 12). The riffle is first riffle 100 m upstream of the bridge and is located downstream of the point where the river makes a slight bend and enters a pool. The instrument is cabled to roots along the right bank and extends to the thalweg of the channel. The riffle structure along the right bank consists of large concrete scraps placed in the channel.

Figure 11: Site 7.5 aerial image.

Figure 12: Site 7.5 at 28 cfs.

Habitat Description: The logger is located in a riffle habitat. It is an area of high surface turbulence downstream of the shallow riffle crest. The riffle is located on a slight meander with a right bank dominated thalweg. The maximum depth is approximately 40 cm (Figure 13). The habitat upstream consists of a shallow riffle flowing from a pool habitat. The pool has limited velocity, but has more overhanging vegetation than other reaches. Downstream, the riffle flows into a run that passes through three large culverts under the Bee Rock Road Bridge. At the logger site, overhanging vegetation is sparse, but submerged roots and artificial structures in the form of concrete scraps create potential beneficial habitat for *O. mykiss* (figure 14).

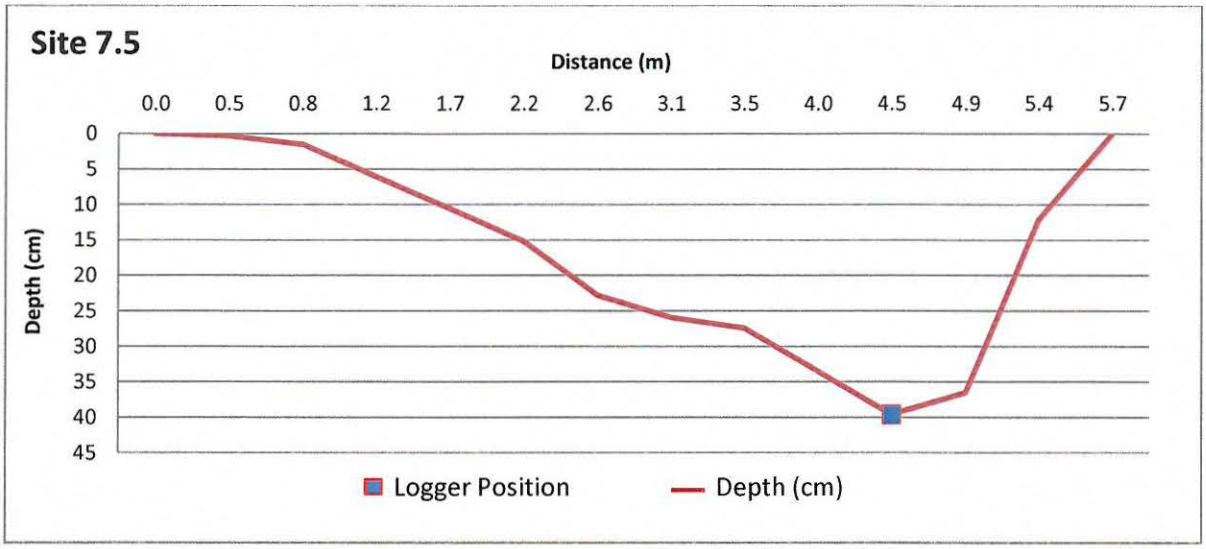


Figure 13: Site 7.5 depth profile starting on the left bank and progressing towards the right.

SWAMP Optical Habitat Evaluation (Ode, 2007)

Algae	Moderate	**Boulders**	Absent	**Undercuts**	Absent	**Rootwads**	Moderate	**Primary Substrate**	Cobble
Emergent Vegetation	Sparse	**Woody Debris**	Absent	**Overhanging Vegetation**	Sparse	**Artificial Structures**	Moderate	**Secondary Substrate**	Gravel

Figure 14: Surface Water Ambient Monitoring Program optical assessment of habitat conditions.

Directions to Site: Enter Camp Roberts through A Street. Take the left fork to California Blvd. Continue down California Blvd and bear right onto Nacimiento Road. Nacimiento Road turns into Perimeter Road near the Range Control Office. Go past Range Control and turn right onto Bee Rock Road and take the bridge over the Nacimiento River. Immediately after crossing the bridge turn right onto an unmarked dirt road. Follow the dirt road for 50 m until it crosses another dirt road that heads towards the river. Park at this site then walk upstream to find the logger.

Temperature Data: The water temperature provided below is based on daily mean, minimum, and maximum degrees Celsius, generated from hourly temperature recording from a Hobo U-22 data logger. Flow is provided in daily average cubic feet per second (cfs) generated from quarter hour preliminary data collected at the USGS 11149400 Nacimiento River below Nacimiento dam near Bradley, CA stream flow gage. Temperature is provided in daily average from the MCWRA weather station located near Nacimiento Dam approximately 9.0 km southwest of Site 7.5. The averages were generated from hourly data in Celsius.

The Hobo U-22 temperature logger was deployed at Site 7.5 on June 6, 2014. Data was collected continuously with downloads occurring on June 17 and 24, July 9 and 25, and August 20. The data represented in Figure 15 includes June 6, 2014 to August 20, 2014. The USGS adjusted preliminary (as of August 27, 2014) flow data based upon field measurements, therefore, they will not match data that was provided in the June and July monitoring reports. The correction does not significantly alter the hydrograph.

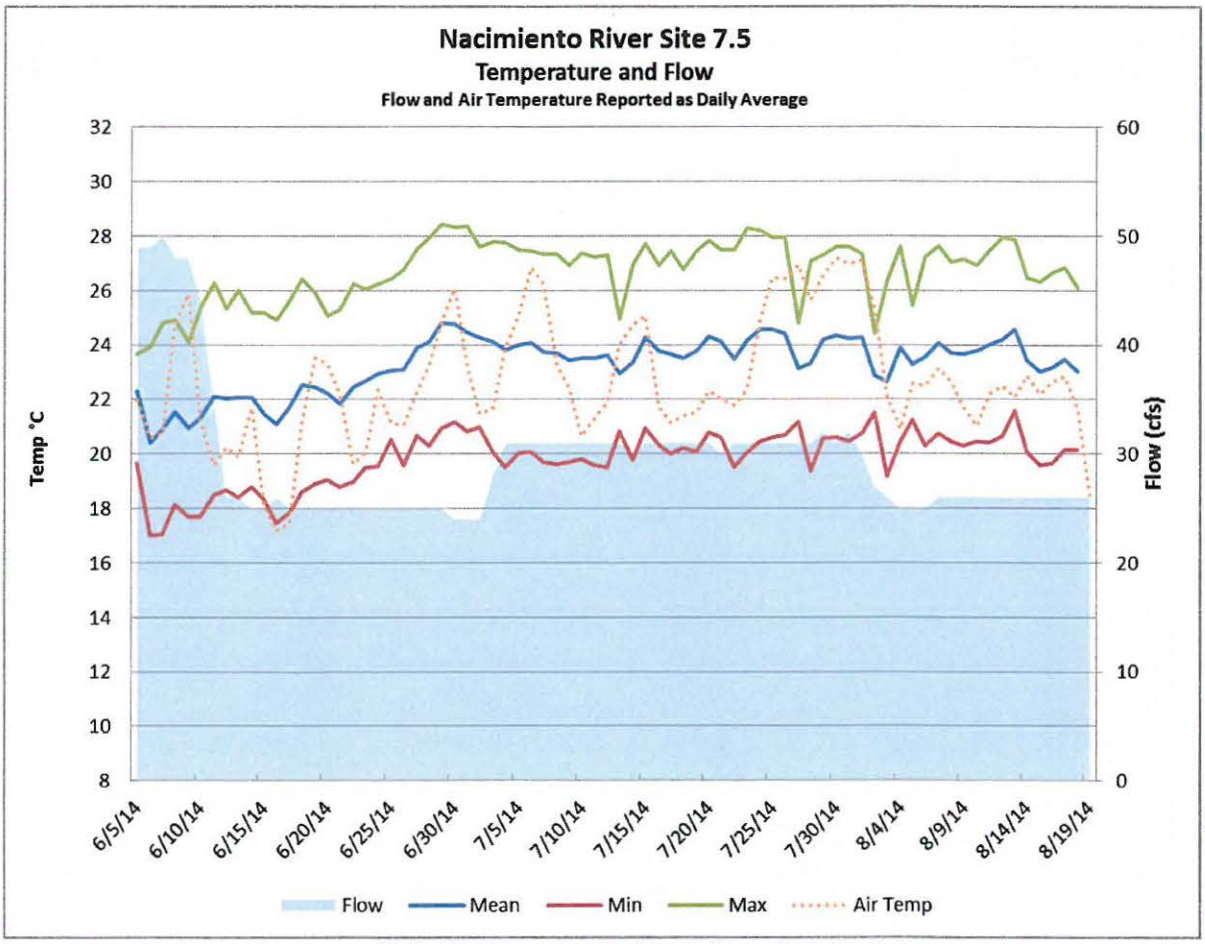


Figure 15: Daily temperature data collected at site 7.5.

Site 10

Location: 35°48'57.16"N 120°45'28.53"W

Site Description: The temperature logger is located approximately 18.0 km (11.18 miles) downstream of the Nacimiento Dam outlet. The monitoring station is located in a habitat best classified as a glide/run transition habitat. The logger is deployed on the left bank 5 m upstream of a river fording point crossing. A dirt road leads to the water edge and continues across the river at the site, approximately 300 m downstream of the abandoned Tower Road Bridge Crossing (figure 16 and 17). The logger is cabled to a vegetated berm. The cabling point is in line with a large oak tree on the left bank.

Figure 16: Site 10 aerial image.

Figure 17: Site 10 at 28 cfs.

Habitat Description: The logger is located in a glide/run transition as it flows from a uniform low velocity habitat upstream. The logger is positioned in the left bank dominated thalweg, amongst rooted aquatic vegetation. The maximum depth of the channel is approximately 50 cm (Figure 18). The habitat upstream consists of open glides, and habitats that could potentially be classified as pool. The low gradient and lack of channel complexities makes habitat typing difficult. The area upstream has limited canopy cover and has slow velocity. The area downstream gets more complex with runs and riffles and the presence of habitat complexities. At the logger site, overhanging vegetation is absent and lacks habitat complexities (figure 19).

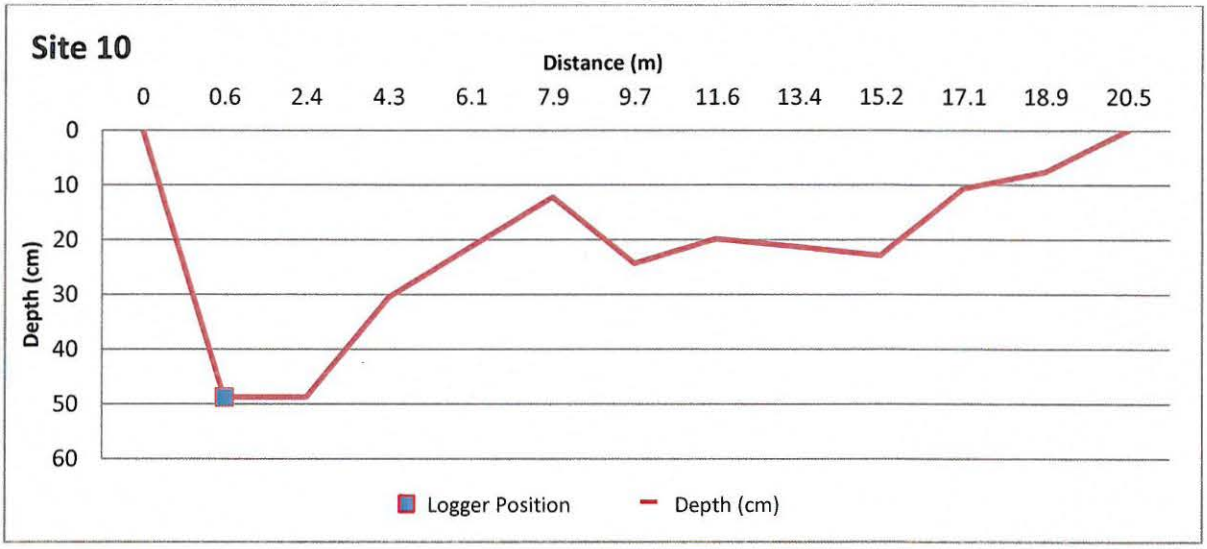


Figure 18: Site 7.5 depth profile starting on the left bank and progressing towards the right.

SWAMP Optical Habitat Evaluation (Ode, 2007)

Algae	Moderate	**Boulders**	Absent	**Undercuts**	Absent	**Rootwads**	Absent	**Primary Substrate**	Gravel
Emergent Vegetation	Moderate	**Woody Debris**	Absent	**Overhanging Vegetation**	Absent	**Artificial Structures**	Absent	**Secondary Substrate**	Cobble

Figure 19: Surface Water Ambient Monitoring Program optical assessment of habitat conditions.

Access Instructions: Enter Camp Roberts through A Street. Take the left fork to California Blvd. Continue down California Blvd and turn Right onto Arizona Blvd. Bear right onto Bridge Road. Before you cross the Bridge over the Nacimiento River turn right onto Well Rd. Take a small unmarked dirt road on the left side towards the river. At time of deployment the road had a small flooded portion. Stay on the left side of the flooded portion. Follow the road down to the water's edge by taking your first fork to the left. Follow the road to the water's edge. The logger is located on the opposite bank.

Temperature Data: The water temperature provided below is based on daily mean, minimum, and maximum degrees Celsius, generated from hourly temperature recording from a Hobo U-22 data logger. Flow is provided in daily average cubic feet per second (cfs) generated from quarter hour preliminary data collected at the USGS 11149400 Nacimiento River below Nacimiento dam near Bradley, CA stream flow gage. Temperature is provided in daily average from the MCWRA weather station located near Nacimiento Dam approximately 13.1 km southwest of Site 10. The averages were generated from hourly data in Celsius.

The Hobo U-22 temperature logger deployed to satisfy the Biological Opinion collected continuously with downloads occurring on June 17 and 24, July 8 and 25 and August 20. The data represented in Figure 20 includes June 5, 2014 to August 20, 2014. The USGS adjusted preliminary (as of August 27, 2014) flow data based upon field measurements, therefore, they will not match data that was provided in the June and July monitoring reports. The correction does not significantly alter the hydrograph.

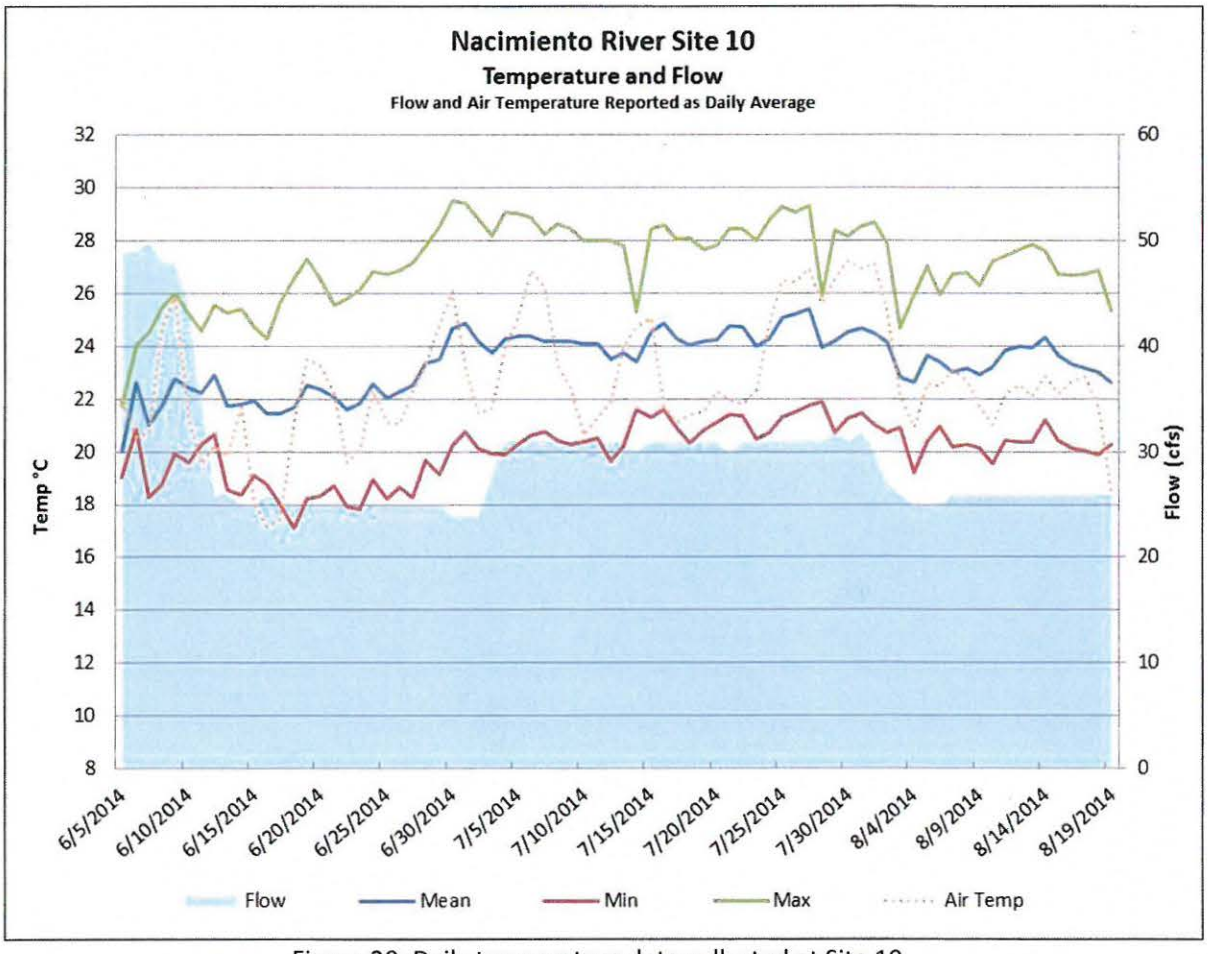


Figure 20: Daily temperature data collected at Site 10.

Site 10 Riffle

Location: 35°48'59.89"N 120°45'25.43"W

Site Description: The temperature logger is located approximately 18.12 km (11.26 miles) downstream of the Nacimiento Dam outlet. The monitoring station is located in a riffle habitat as it enters a pool. The logger is deployed on the right bank directly downstream of a river forging point crossing. A dirt road leads to the water edge and continues parallel through the channel (figure 21 and 22). The deployment location is approximately 330 m upstream of the Highway 101 overcrossing. The logger is cabled to a willow that is overhanging the right bank.

Figure 21: Site 10 Riffle aerial image.

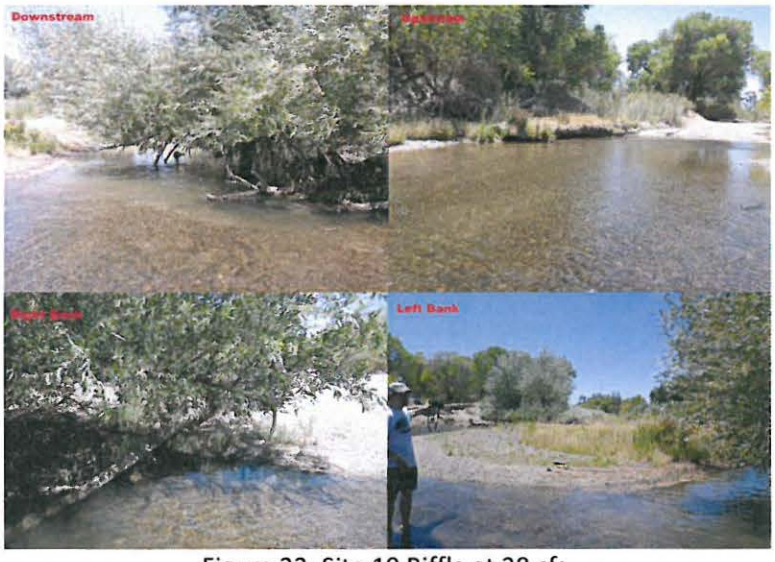


Figure 22: Site 10 Riffle at 28 cfs.

Habitat Description: The logger is located in a riffle as it transition into a pool. The logger is positioned along the right bank of a central thalweg. The maximum depth of the channel is approximately 55 cm (Figure 23). The habitat upstream consists of a shallow riffle, exiting a run. This site is downstream of Site 10 by approximately 120 m and lacks canopy cover. The area downstream of the logger becomes more complex with runs and riffles and the presence of habitat complexities such as woody debris. At the logger site, overhanging vegetation is heavy providing shade over the logger and has habitat complexities in the form of rootwads and woody debris (figure 24).

Figure 23: Site 7.5 depth profile starting on the left bank and progressing towards the right.

SWAMP Optical Habitat Evaluation (Ode, 2007)

Algae	Moderate	**Boulders**	Absent	**Undercuts**	Moderate	**Rootwads**	Moderate	**Primary Substrate**	Gravel
Emergent Vegetation	Sparse	**Woody Debris**	Moderate	**Overhanging Vegetation**	Heavy	**Artificial Structures**	Absent	**Secondary Substrate**	Cobble

Figure 24: Surface Water Ambient Monitoring Program optical assessment of habitat conditions.

Access Instructions: Enter Camp Roberts through A Street. Take the left fork to California Blvd. Continue down California Blvd and turn Right onto Arizona Blvd. Bear right onto Bridge Road. Before you cross the Bridge over the Nacimiento River turn right onto Well Rd. Take a small unmarked dirt road on the left side towards the river. At time of deployment the road had a small flooded portion. Stay on the left side of the flooded portion, but take the fork in the road to the right. The dirt road leads to the water's edge at another fording point. Park at this location and the logger is located downstream.

Temperature Data: The water temperature provided below is based on daily mean, minimum, and maximum degrees Celsius, generated from hourly temperature recording from a Hobo U-22 data logger. Flow is provided in daily average cubic feet per second (cfs) generated from quarter hour preliminary data collected at the USGS 11149400 Nacimiento River below Nacimiento dam near Bradley, CA stream flow gage. Temperature is provided in daily average from the MCWRA weather station located near Nacimiento Dam approximately 13.1 km southwest of Site 10 riffle. The averages were generated from hourly data in Celsius.

The Hobo U-22 temperature logger was deployed at Site 10 Riffle on June 12, 2014. Data was collected continuously with downloads occurring on June 17 and 24, July 9 and 25, and August 20. The data represented in Figure 2 5 includes June 12, 2014 to August 20, 2014 temperature data. The USGS adjusted preliminary (as of August 27, 2014) flow data based upon field measurements, therefore, they will not match data that was provided in the June and July monitoring reports. The correction does not significantly alter the hydrograph.

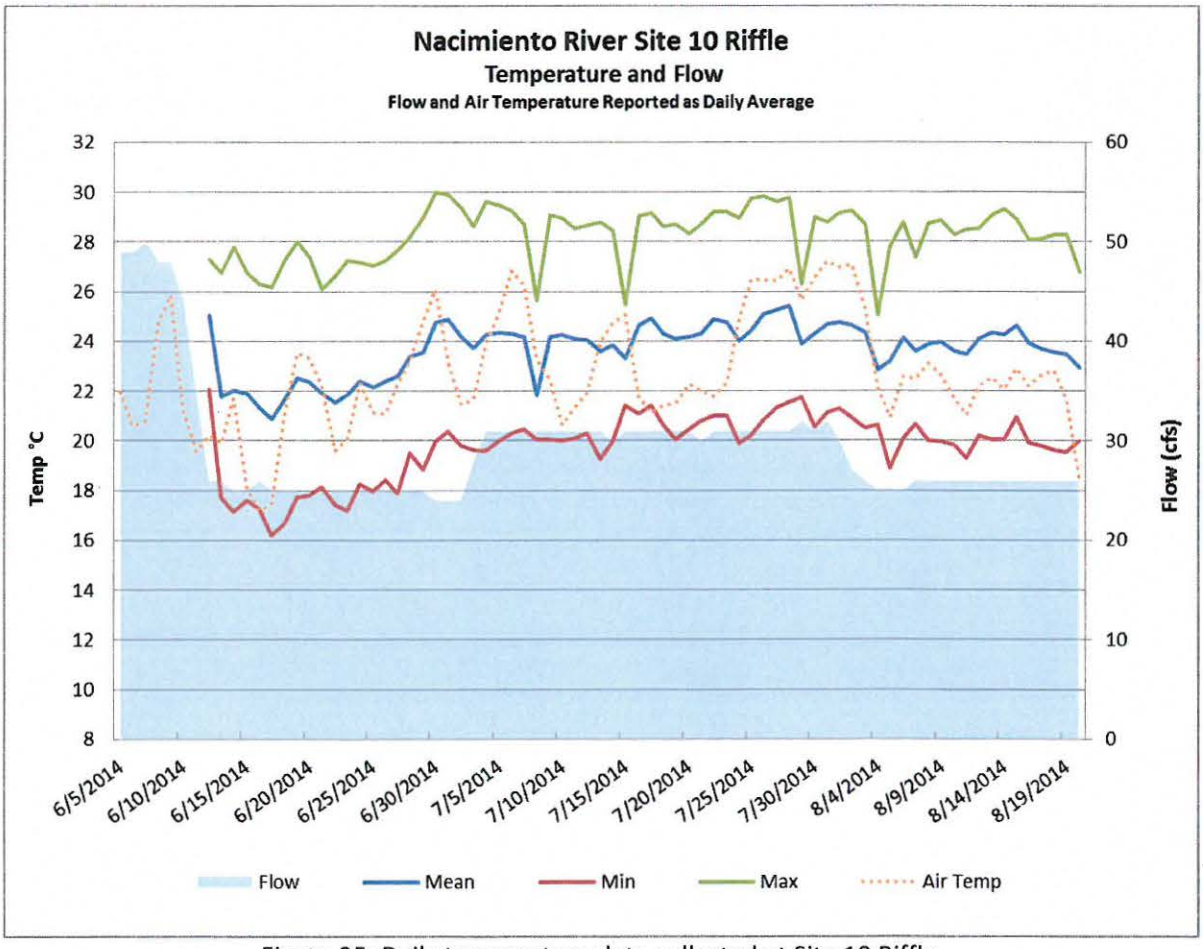


Figure 25: Daily temperature data collected at Site 10 Riffle.

Heritage Ranch Temperature Data

Instantaneous temperature data is collected once daily at the Heritage Ranch intake structure. This data is collected by Heritage Ranch Staff and is not regulated or evaluated by MCWRA staff. The temperature is of the water drawn from the Nacimiento River approximately 0.64 km (0.42 miles) downstream of the outlet (Figure 26). Temperature readings are collected at variable times daily. All data provided to MCWRA is presented in the table below (Figure 27).

Figure 26: Heritage Ranch Site aerial image

Date	Time	Temp °C
6/6/2014	9:00:00 AM	13.2
6/7/2014	9:00:00 AM	12.8
6/8/2014	9:00:00 AM	13.1
6/9/2014	9:00:00 AM	13.5
6/10/2014	9:00:00 AM	13.7
6/11/2014	9:00:00 AM	13.5
6/12/2014	9:00:00 AM	12.4
6/13/2014	9:00:00 AM	12
6/14/2014	8:35:00 AM	12.9
6/15/2014	2:30:00 PM	16.7
6/16/2014	1:45:00 PM	16.4
6/17/2014	2:10:00 PM	16.1
6/18/2014	3:00:00 PM	16.3
6/19/2014	10:18:00 AM	15
6/20/2014	9:14:00 AM	14
6/21/2014		
6/22/2014		
6/23/2014	1:05:00 PM	16.6

6/24/2014	1:00:00 PM	16.4
6/25/2014	2:18:00 PM	16.6
6/26/2014	1:57:00 PM	17.6
6/27/2014	2:10:00 PM	17.4
6/28/2014	2:42:00 PM	17.8
6/29/2014	1:35:00 PM	16.9
6/30/2014	2:42:00 PM	17.0
7/1/2014	1:07:00 PM	16.7
7/2/2014	1:31:00 PM	17.4
7/3/2014		
7/4/2014	1:45:00 PM	17.2
7/5/2014	1:30:00 PM	16.9
7/6/2014	2:15:00 PM	17.1
7/7/2014	1:30:00 PM	17.0
7/8/2014	10:30:00 AM	14.7
7/9/2014	3:00:00 PM	15.4
7/10/2014	9:01:00 AM	13.7
7/11/2014	2:45:00 PM	16.0
7/12/2014	11:26:00 AM	15.9
7/13/2014	1:08:00 PM	16.7
7/14/2014	8:15:00 AM	12.9
7/15/2014	1:18:00 PM	16.4
7/16/2014	2:00:00 PM	16.2
7/17/2014	9:30:00 AM	14.6
7/18/2014	1:04:00 PM	16.4
7/19/2014	1:37:00 PM	15.9
7/20/2014	2:00:00 PM	15.6
7/21/2014	2:52:00 PM	16.7
7/22/2014	1:00:00 PM	17.5
7/23/2014	9:40:00 AM	15
7/24/2014	2:15:00 PM	17.7
7/25/2014	3:09:00 PM	17
7/26/2014	2:07:00 PM	16.8
7/27/2014	2:21:00 PM	15.4
7/28/2014	3:00:00 PM	15.6
7/29/2014	2:04:00 PM	15.6
7/30/2014	1:00:00 PM	16.4
7/31/2014	9:00:00 AM	14.1
8/1/2014	8:30:00 AM	14.8
8/2/2014	2:30:00 PM	15.4
8/3/2014	1:30:00 PM	15.8

8/4/2014	1:00:00 PM	15.9
8/5/2014	1:04:00 PM	16.2
8/6/2014	2:51:00 PM	17.1
8/7/2014		
8/8/2014	1:10:00 PM	16.7
8/9/2014	12:47:00 PM	16.8
8/10/2014	8:00:00 AM	15.5
8/11/2014	12:57:00 PM	16.7
8/12/2014	12:50:00 PM	17.4
8/13/2014	11:15:00 AM	16.4
8/14/2014	8:40:00 AM	13.6
8/15/2014	10:10:00 AM	15.4

Figure 27: Heritage Ranch inlet temperature data.

Nacimiento River Snorkel Survey
Preliminary Report
August 18, 2014

Based on recommendations by National Marine Fisheries Service, snorkel surveys for South Central California Coast Steelhead (Oncorhynchus mykiss) were conducted on the Nacimiento River for two consecutive days starting on August 11, 2014. The survey targeted beneficial habitats for salmonids, and did not use random site selection. Subsets of sites sampled during the July 2014 effort were resampled, and eight additional sites were added. Data collected cannot be used as an index for population assessments, but served as a presence and absence analysis for *O. mykiss*.

Over the two day period 17 individual sites ranging from 15 m to 30 m in length were sampled throughout the entire length of the Nacimiento River (Figure 1). Sites sampled consisted of riffles, runs, and pools, but most effort was focused on riffle habitats with complexities such as boulders, large woody debris, undercut banks, rootwads, and canopy cover. Water clarity in the upper reaches of the Nacimiento River was poor (less than 1 m (secchi)). Surveys started 2.92 km downstream of the dam with a visibility of less than 1.3 m. Visibility throughout the entire length of the Nacimiento River limited the surveys effectiveness, but *O. mykiss* were observed.

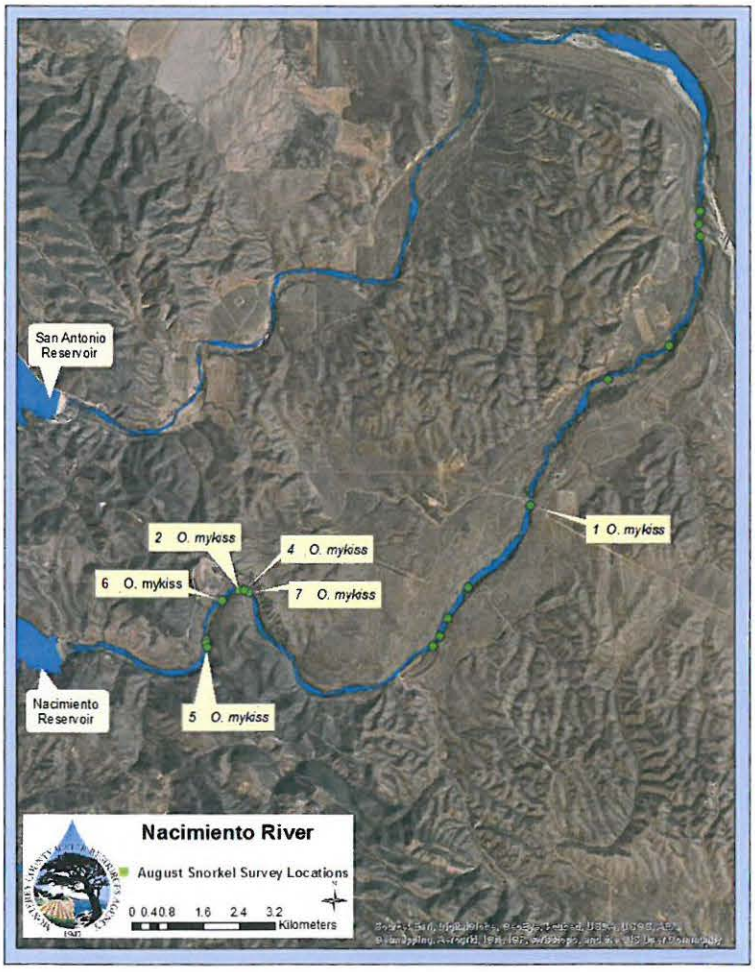


Figure 1: Snorkel Survey Location Map.

A total of 25 *O. mykiss* were observed during the survey. This exceeded the July survey effort substantially. Twenty-four of the *O.* mykiss were observed between 2.92 and 4.52 km downstream of the dam. All *O. mykiss* were positively identified (Figure 2 and 3). The water temperature ranged between 18.4°C and 21.1°C with dissolved oxygen levels between 9.88 mg/L and 10.31 mg/L. Twenty-two of the *O.* mykiss were estimated at 50-100 mm, and two were 100-150 mm. *O.* mykiss were observed at three sites that they were not observed at in the July sampling effort.

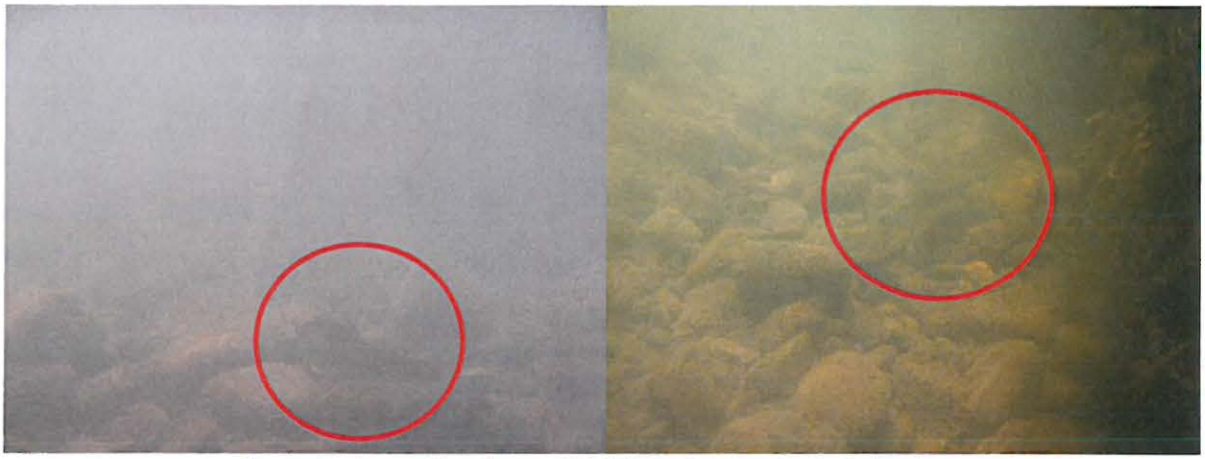


Figure 2: *O. mykiss* observed 2.92 km downstream of the dam.

Figure 3: *O. mykiss* observed 4.52 km downstream of the dam.

One other *O. mykiss* was observed 12.5 km downstream of the dam (Figure 4). This was in the same location that four fish were observed during the July survey. The fish's length estimate was categorized as greater than 150 mm, but the actual length estimate was 300 mm. The location and length estimate are consistent with the adult that was observed in July, providing evidence that this was the same fish persisting in the area. At the time of observation the water temperature was 27.01°C and dissolved oxygen was 11.45 mg/l. The fish did not show signs of stress (gasping or lethargy), and it was observed suspended in an undercut bank. The fish showed a strong flight response when approached.

Figure 4: *O. mykiss* adult observed 12.5 km downstream of the dam.

Though visibility on the Nacimiento River limited the effectiveness of snorkel surveys, *O. mykiss* were observed to a point 12.5 km below the dam. This is the same area of persistence boundary that was observed during the July survey. The areas that are holding *O. mykiss* are habitats with a gradient change, and habitat features that creates fast turbulent water with depths greater than 50 cm (Figure 5). Based on the August survey effort, it is evident that the population of *O. mykiss* in the Nacimiento River is greater than what was perceived through the July survey effort.

Figure 5: Areas of occurrence of *O. mykiss.*