

July 3, 2018

**MEETING NOTICE & REQUEST FOR RSVP**

**TO: ENVIRONMENTAL AND WATER RESOURCES COMMITTEE**

<b><u>Jurisdiction</u></b>	<b><u>Representative</u></b>	<b><u>Representative</u></b>	<b><u>Representative</u></b>
District 1	Bonnie Bamburg	Loren Lewis	Rita Norton
District 2	Charles Ice	Elizabeth Sarmiento	
District 3	Hon. Dean Chu	Rev. Jethroe Moore, II	Charles Taylor
District 4	John Bourgeois	Bob Levy	Richard R. Zahner
District 5	Hon. Tara Martin-Milius	Mike Michitaka	Marc Rauser
District 6	Maya Esparza	Hon. Patrick Kwok	
District 7	Tess Byler	Arthur M. Keller, Ph.D.	Stephen A. Jordan

The regular meeting of the Environmental and Water Resources Committee is scheduled to be held on **Monday, July 16, 2018, at 6:00 p.m.** in the Headquarters Building Boardroom located at the Santa Clara Valley Water District, 5700 Almaden Expressway, San Jose, California. Dinner will be served.

Enclosed are the meeting agenda and corresponding materials. Please bring this packet with you to the meeting. Additional copies of this meeting packet are available on-line at <https://www.valleywater.org/how-we-operate/committees/board-advisory-committees>

A majority of the appointed membership is required to constitute a quorum, which is fifty percent plus one. A quorum for this meeting must be confirmed at least 48 hours prior to the scheduled meeting date or it will be canceled.

Further, a quorum must be present on the day of the scheduled meeting to call the meeting to order and take action on agenda items.

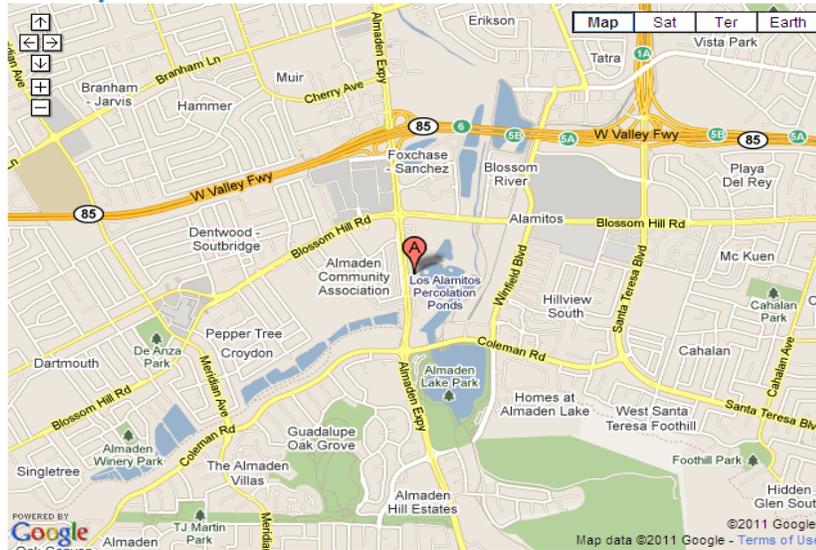
Members with two or more consecutive unexcused absences will be subject to rescinded membership.

Please confirm your attendance **no later than Thursday, July 12, 2018, 5:00 p.m.** by contacting Ms. Glenna Brambill at 1-408-630-2408, or [gbrambill@valleywater.org](mailto:gbrambill@valleywater.org).

Enclosures



**Santa Clara Valley Water District - Headquarters Building,  
5700 Almaden Expressway, San Jose, CA 95118**



**From Oakland:**

- Take 880 South to 85 South
- Take 85 South to Almaden Expressway exit
- Turn left on Almaden Plaza Way
- Turn right (south) on Almaden Expressway
- At Via Monte (third traffic light), make a U-turn
- Proceed north on Almaden Expressway approximately 1,000 feet
- Turn right (east) into the campus entrance

**From Morgan Hill/Gilroy:**

- Take 101 North to 85 North
- Take 85 North to Almaden Expressway exit
- Turn left on Almaden Expressway
- Cross Blossom Hill Road
- At Via Monte (third traffic light), make a U-turn
- Proceed north on Almaden Expressway approximately 1,000 feet
- Turn right (east) into the campus entrance

**From Sunnyvale:**

- Take Highway 87 South to 85 North
- Take Highway 85 North to Almaden Expressway exit
- Turn left on Almaden Expressway
- At Via Monte (third traffic light), make a U-turn
- Proceed north on Almaden Expressway approximately 1,000 feet
- Turn right (east) into the campus entrance

**From San Francisco:**

- Take 280 South to Highway 85 South
- Take Highway 85 South to Almaden Expressway exit
- Turn left on Almaden Plaza Way
- Turn right (south) on Almaden Expressway
- At Via Monte (third traffic light), make a U-turn
- Proceed north on Almaden Expressway approximately 1,000 feet
- Turn right (east) into the campus entrance

**From Downtown San Jose:**

- Take Highway 87 - Guadalupe Expressway South
- Exit on Santa Teresa Blvd.
- Turn right on Blossom Hill Road
- Turn left at Almaden Expressway
- At Via Monte (first traffic light), make a U-turn
- Proceed north on Almaden Expressway approximately 1,000 feet
- Turn right (east) into the campus entrance

**From Walnut Creek, Concord and East Bay areas:**

- Take 680 South to 280 North
- Exit Highway 87-Guadalupe Expressway South
- Exit on Santa Teresa Blvd.
- Turn right on Blossom Hill Road
- Turn left at Almaden Expressway
- At Via Monte (third traffic light), make a U-turn
- Proceed north on Almaden Expressway approximately 1,000 feet
- Turn right (east) into the campus entrance



**Santa Clara Valley Water District  
Environmental and Water Resources  
Committee Meeting**

**HQ Boardroom  
5700 Almaden Expressway  
San Jose CA 95118**

**REGULAR MEETING  
AGENDA**

**Monday, July 16, 2018  
6:00 PM**

**District Mission: Provide Silicon Valley safe, clean water for a healthy life, environment and economy.**

All public records relating to an item on this agenda, which are not exempt from disclosure pursuant to the California Public Records Act, that are distributed to a majority of the legislative body will be available for public inspection at the Office of the Clerk of the Board at the Santa Clara Valley Water District Headquarters Building, 5700 Almaden Expressway, San Jose, CA 95118, at the same time that the public records are distributed or made available to the legislative body. Santa Clara Valley Water District will make reasonable efforts to accommodate persons with disabilities wishing to attend Board of Directors' meeting. Please advise the Clerk of the Board Office of any special needs by calling (408) 265-2600.

**Note: The finalized Board Agenda, exception items and supplemental items will be posted prior to the meeting in accordance with the Brown Act.**

**Santa Clara Valley Water District**  
**Environmental and Water Resources Committee**  
**REGULAR MEETING**  
**AGENDA**

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Monday, July 16, 2018

6:00 PM

HQ Boardroom

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**1. CALL TO ORDER:**

1.1. Roll Call.

2. Time Open for Public Comment on any Item not on the Agenda.

*Notice to the public: This item is reserved for persons desiring to address the Committee on any matter not on this agenda. Members of the public who wish to address the Committee on any item not listed on the agenda should complete a Speaker Form and present it to the Committee Clerk. The Committee Chair will call individuals in turn. Speakers comments should be limited to two minutes or as set by the Chair. The law does not permit Committee action on, or extended discussion of, any item not on the agenda except under special circumstances. If Committee action is requested, the matter may be placed on a future agenda. All comments that require a response will be referred to staff for a reply in writing. The Committee may take action on any item of business appearing on the posted agenda.*

**3. APPROVAL OF MINUTES:**

3.1. Approval of Minutes.

[18-0520](#)

Recommendation: Approve the April 16, 2018, Meeting Minutes.

Manager: Michele King, 408-630-2711

Attachments: [Attachment 1: 041618 EWRC DRAFT Mins](#)

**4. ACTION ITEMS:**

4.1. Salmonid in the District's waterways referencing Dr. Jerry Smith's Letter (Distributed at 1/22/2018).

[18-0522](#)

Recommendation: This is a discussion item and the Committee may provide comments if applicable, however no action is required.

Manager: Vincent Gin, 408-630-2633

Attachments: [Attachment 1: Salmonids in District's Waterways](#)  
[Attachment 2: Jerry Smith's Letter](#)

Est. Staff Time: 10 Minutes

- 4.2. Update from Environmental and Water Resources Committee's Working Groups. [18-0523](#)  
Recommendation: Provide comments to the Board on implementation of District mission applicable to working groups' recommendations.  
Manager: Michele King, 408-630-2711  
Attachments: [Attachment 1: EWRC Working Groups Spreadsheet](#)  
Est. Staff Time: 10 Minutes

- 4.3. Review Environmental and Water Resources Committee Work Plan, the Outcomes of Board Action of Committee Requests; and the Committee's Next Meeting Agenda. [18-0524](#)  
Recommendation: Review the Committee work plan to guide the Committee's discussions regarding policy alternatives and implications for Board deliberation.  
Manager: Michele King, 408-630-2711  
Attachments: [Attachment 1: 2018 EWRC Work Plan](#)  
[Attachment 2: 101518 EWRC Draft Agenda](#)  
Est. Staff Time: 10 Minutes

5. Clerk Review and Clarification of Committee Requests.  
*This is an opportunity for the Clerk to review and obtain clarification on any formally moved, seconded, and approved requests and recommendations made by the Committee during the meeting.*

**6. REPORTS:**

- 6.1. Director's Report  
6.2. Manager's Report  
6.3. Committee Member Reports

**7. ADJOURN:**

- 7.1. Adjourn to Regular Meeting at 6:00 p.m., on October 15, 2018, in the Santa Clara Valley Water District Headquarters Building Boardroom, 5700 Almaden Expressway, San Jose, California.

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**File No.:** 18-0520

**Agenda Date:** 7/16/2018

**Item No.:** 3.1.

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## COMMITTEE AGENDA MEMORANDUM

### Environmental and Water Resources Committee

**SUBJECT:**

Approval of Minutes.

**RECOMMENDATION:**

Approve the April 16, 2018, Meeting Minutes.

**SUMMARY:**

A summary of Committee discussions, and details of all actions taken by the Committee, during all open and public Committee meetings, is transcribed and submitted for review and approval.

Upon Committee approval, minutes transcripts are finalized and entered into the District's historical records archives and serve as historical records of the Committee's meetings

**ATTACHMENTS:**

Attachment 1: 041618 EWRC Draft Minutes

**UNCLASSIFIED MANAGER:**

Michele King, 408-630-2711

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ENVIRONMENTAL AND WATER RESOURCES COMMITTEE MEETING

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# DRAFT MINUTES

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**MONDAY, APRIL 16, 2018  
6:00 PM**

(Paragraph numbers coincide with agenda item numbers)

A regular scheduled meeting of the Environmental and Water Resources Committee (Committee) Meeting was held on April 16, 2018, in the Headquarters Building Boardroom at the Santa Clara Valley Water District, 5700 Almaden Expressway, San Jose, California.

**1. CALL TO ORDER/ROLL CALL**

Chair Loren Lewis called the meeting to order at 6:04 p.m.

Members in attendance were:

<b><u>District</u></b>	<b><u>Representative</u></b>
District 1	Bonnie Bamburg Loren Lewis Rita Norton
District 3	Hon. Dean Chu
District 4	John Bourgeois Bob Levy
District 5	Marc Rauser
District 6	Hon. Patrick S. Kwok
District 7	Tess Byler Stephen A. Jordan Arthur M. Keller, Ph.D.*

Members not in attendance were:

<b><u>District</u></b>	<b><u>Representative</u></b>
District 2	Elizabeth Sarmiento
District 3	Rev. Jethroe Moore, II Charles Taylor
District 4	Richard Zahner
District 5	Mike Michitaka Hon. Tara Martin-Milius
District 6	Maya Esparza

\*Committee members arrived as noted below.

Board members in attendance were: Director Tony Estremera, Board Representative and Director Nai Hsueh, Board Alternate.

Staff members in attendance were: Glenna Brambill, Vincent Gin, Garth Hall, Anthony Mendiola, Afshin Rouhani and Darin Taylor.

Guests in attendance were: Charles Ice and Doug Muirhead.

**2. PUBLIC COMMENT**

Mr. Richard McMurtry from Santa Clara County Creeks Coalition spoke and distributed a letter for Committee consideration.

**3. APPROVAL OF MINUTES**

It was moved by Ms. Bonnie Bamburg, seconded by Hon. Dean Chu and unanimously carried, to approve the January 22, 2018, Environmental and Water Resources Committee meeting minutes, with an amendment on page 3 under 5.4. to read as *“approved to add Salmonid on District’s Water Ways referencing Dr. Jerry Smith’s letter that was distributed earlier as an action item to the work plan.”* Hon. Patrick S. Kwok abstained.

**4. ACTION ITEMS**

**4.1 UPDATE ON FLOOD PROTECTION MANAGEMENT PLAN**

Mr. Afshin Rouhani reviewed the materials as outlined in the agenda item

Arthur M. Keller, Ph.D., arrived at 6:23 p.m.

Ms. Bonnie Bamburg, Ms. Rita Norton, Arthur M. Keller, Ph.D., Ms. Tess Byler and Mr. Marc Rauser had questions on the timeline on current projects, sea level rise, climate change issues, utilization of open space, flood charts, partnerships and what are the local efforts in Morgan Hill.

No action was taken.

**4.2 REVIEW AND COMMENT TO THE BOARD ON THE FISCAL YEAR 2019 PROPOSED GROUNDWATER PRODUCTION CHARGES**

Mr. Darin Taylor reviewed the materials as outlined in the agenda item and the PAWS report was distributed. Mr. Garth Hall was available to answer questions.

Ms. Tess Byler, Mr. Marc Rauser, Mr. Stephen Jordan, Hon. Patrick S. Kwok, Ms. Rita Norton, Arthur M. Keller, Ph.D., Hon. Dean Chu and Ms. Bonnie Bamburg had questions on retailer costs, P3 information, high funded projects, reservoir expansion, keeping ag costs low, groundwater versus treated water charges, have comparison charts for new charges versus old charges,

It was moved by Chair Loren Lewis, seconded by Mr. Stephen Jordan and motion failed, to approve staff’s recommendation of the proposed groundwater production charges. There were four yes votes by; Mr. Loren Lewis, Mr. Stephen Jordan, Hon. Patrick S. Kwok, and Ms. Tess Byler, four no votes by; Mr. John Bourgeois, Mr. Marc Rauser, Ms. Bonnie Bamburg and Ms. Rita Norton and three abstentions by; Mr. Bob Levy, Hon. Dean Chu and Arthur M. Keller, Ph.D.

### **4.3 UPDATE FROM WORKING GROUPS**

Mr. Loren Lewis reviewed the materials as outlined in the agenda item.

Arthur M. Keller, Ph.D. had sent emails to his two working groups to schedule meetings.

No action was taken.

### **4.4 REVIEW OF ENVIRONMENTAL AND WATER RESOURCES COMMITTEE WORK PLAN, THE OUTCOMES OF BOARD ACTION OF COMMITTEE REQUESTS AND THE COMMITTEE'S NEXT MEETING AGENDA**

Mr. Loren Lewis and Ms. Glenna Brambill reviewed the materials as outlined in the agenda item.

The Committee took the following action:

Through the Chair add the One Water Plan in 2019, have the FAHCE update in October and change the Salmonid item to July.

## **5. CLERK REVIEW AND CLARIFICATION OF COMMITTEE'S REQUESTS TO THE BOARD**

Ms. Glenna Brambill reported there were no action items for the Board consideration.

## **6. REPORTS**

### **6.1 Director's Report**

Director Tony Estremera reported on the following:

- Board Action
- Water Supply
- Flood Protection
- Community Outreach

### **6.2. Manager's Report**

Mr. Garth Hall reported on the following:

- CA WaterFix Update
- Water Storage Planning Projects

Mr. Vincent Gin reported on the following:

- SFEI May Summit May 17<sup>th</sup> and May 18<sup>th</sup> in Oakland CA
- Santa Clara Basin Storm Water Resource Plan (SWRP) Stakeholder Meeting on April 23, 2018 at the Water District

### **6.3 Committee Member Reports**

Ms. Rita Norton reported on the following:

- The League of Women Voters are hosting a webinar on Climate Change, May 16<sup>th</sup> at the Water District's Boardroom

**7. ADJOURNMENT**

Chair Mr. Loren Lewis adjourned in honor and memory of long time EAC and EWRC Member Ms. Patricia Colombe who passed away in October of 2017, at 7:55 p.m. to the next regular meeting on Monday, July 16, 2018, at 6:00 p.m., in the Santa Clara Valley Water District Headquarters Boardroom.

Submitted by:

Glenna Brambill  
Board Committee Liaison  
Office of the Clerk of the Board

Approved:

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**File No.:** 18-0522

**Agenda Date:** 7/16/2018

**Item No.:** 4.1.

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## COMMITTEE AGENDA MEMORANDUM

### Environmental and Water Resources Committee

**SUBJECT:**

Salmonid in the District's waterways referencing Dr. Jerry Smith's Letter (Distributed at 1/22/2018).

**RECOMMENDATION:**

This is a discussion item and the Committee may provide comments if applicable, however no action is required.

**SUMMARY:**

This item was added to the Committee's Work Plan at the January 22, 2018 meeting as a discussion item. Staff will provide an update to the Committee on fisheries conditions in Santa Clara County including discussion of District related fisheries efforts.

**BACKGROUND:**

On January 22, 2018, a report on the distribution and abundance of rainbow trout/steelhead in Coyote Creek by Dr. Jerry Smith was distributed for the record at the EWRC meeting. Dr. Smith's December 17, 2017 report summarized fisheries sampling results from 2014 through 2017 in Coyote Creek. The Committee through majority vote placed the subject item on its 2018 Work Plan with a request for discussion of District related efforts in Santa Clara County.

Staff will provide a brief introduction on steelhead, discuss District fisheries stewardship and monitoring efforts, provide some insights on understanding of steelhead monitoring data collected in Santa Clara County as well as data from comparative regional counties, and factors affecting steelhead populations.

**ATTACHMENTS:**

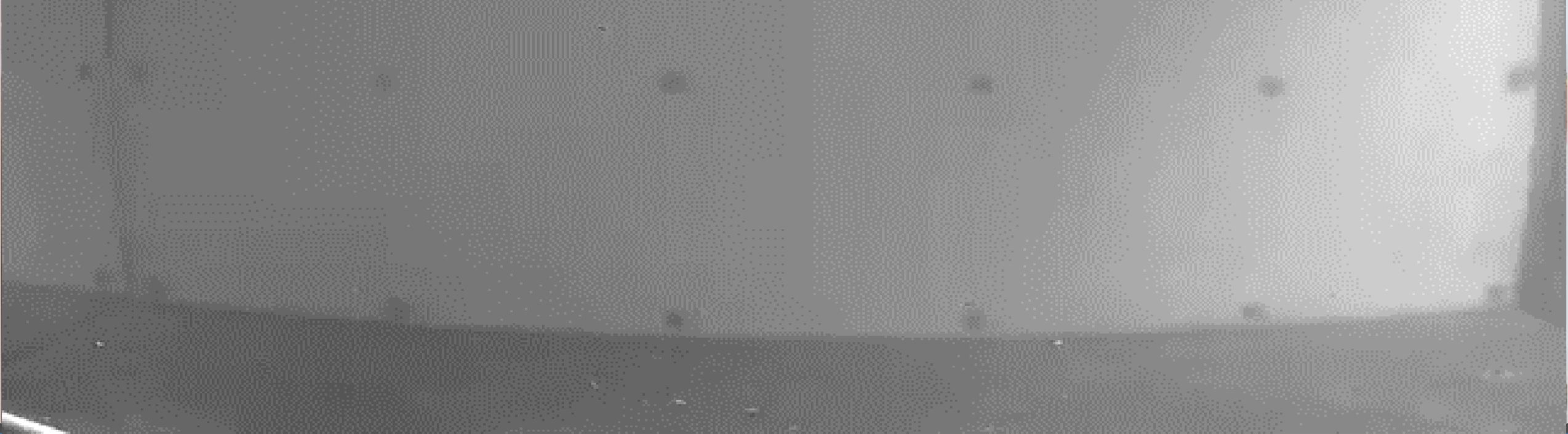
Attachment 1: PowerPoint Presentation

Attachment 2: Jerry Smith's Letter

**UNCLASSIFIED MANAGER:**

Vincent Gin, 408-630-2633





# District's Fisheries Efforts

July 16, 2018



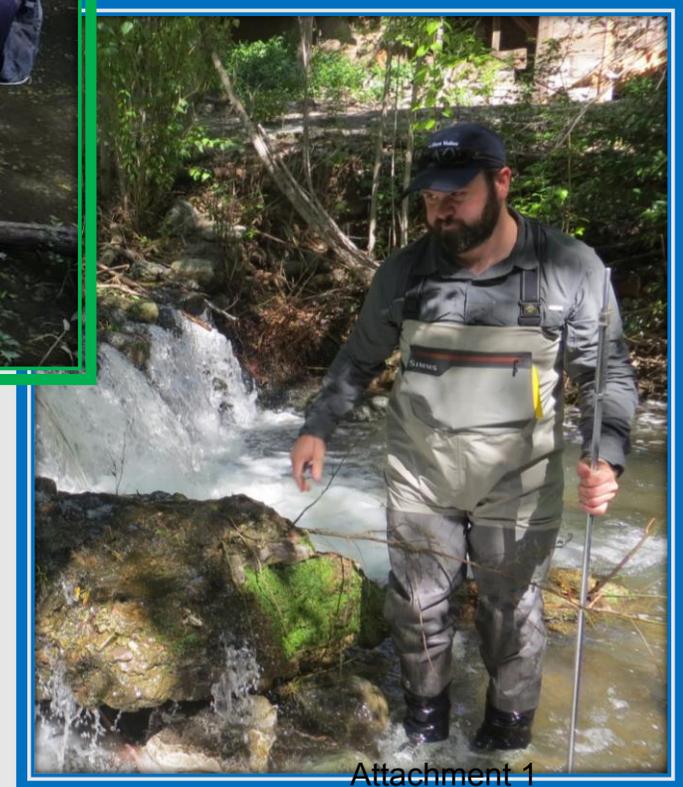
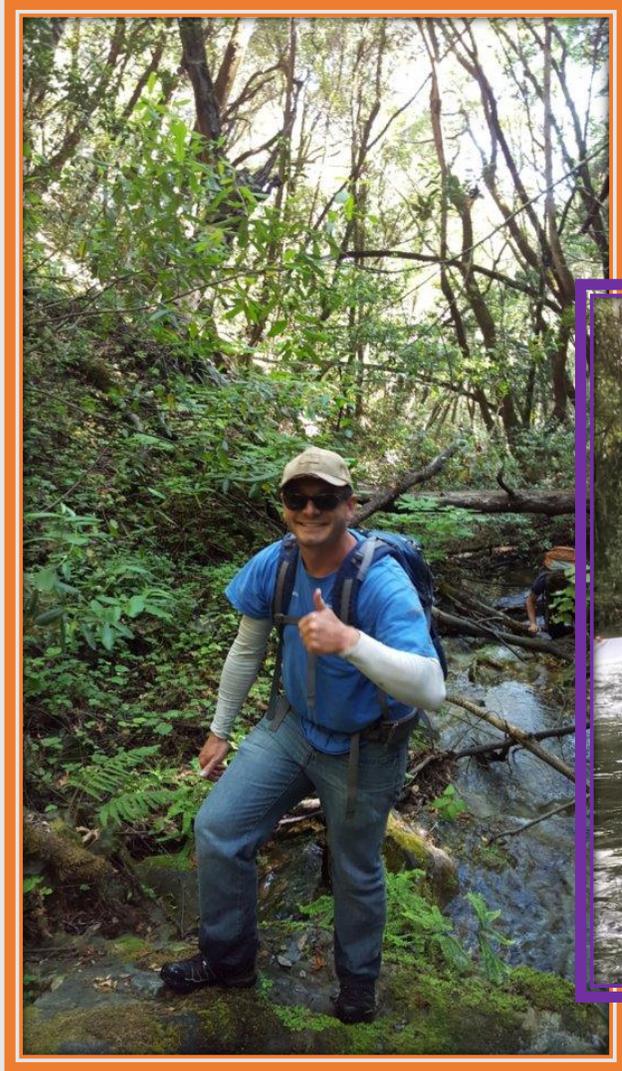
# Agenda

- District's fisheries staff
- Introduction to steelhead
- District's fisheries efforts
- Understanding monitoring data
- Regional steelhead data
- District's monitoring efforts
- Conclusions





# District's Fisheries Staff



and many more

# Steelhead (*Oncorhynchus mykiss*)

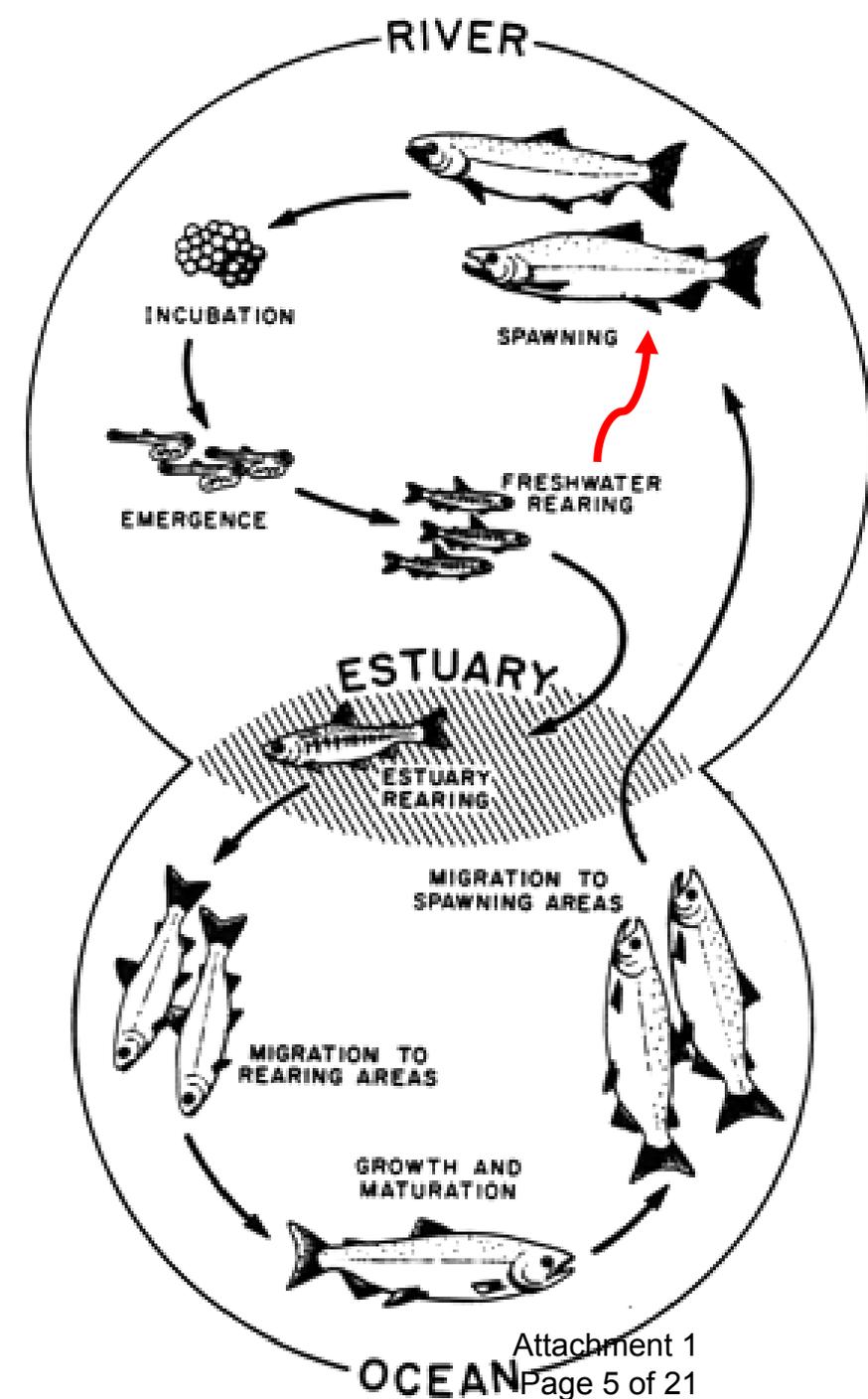
- Anadromous rainbow trout
  - Spawn and rear in freshwater and mature in the ocean
- Santa Clara County has 2 distinct population segments
- Federally Listed Threatened Species

# Steelhead Lifecycle

The process of anadromy

“Resident” *O. mykiss*

- Do not migrate
- Can produce anadromous offspring.



# Steelhead or Rainbow Trout

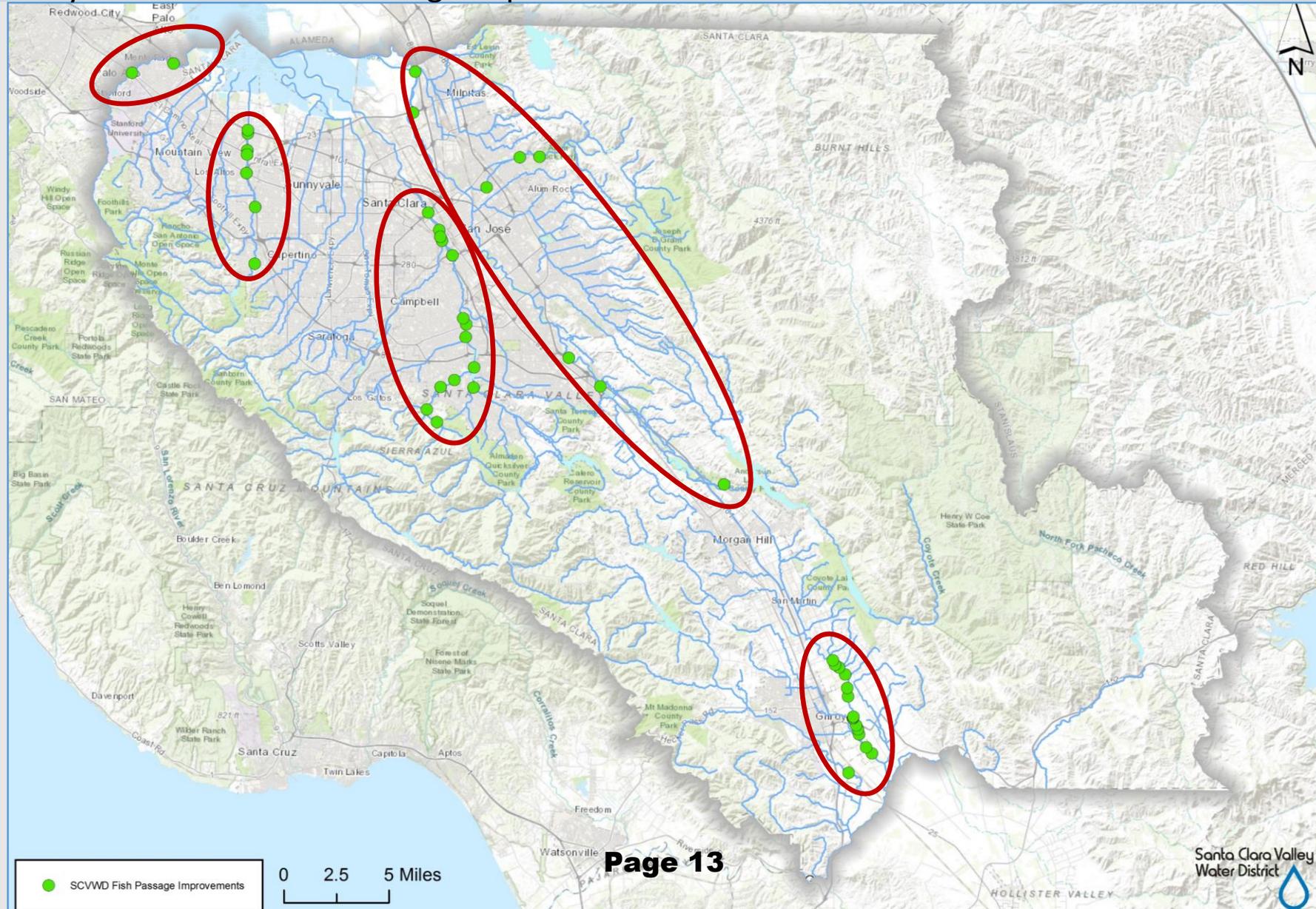
All *O. mykiss* downstream of  
Santa Clara County dams could be steelhead



*Oncorhynchus mykiss*  
Guadalupe Creek, Fall 2017

# District's Fisheries Efforts

## Santa Clara County Anadromous Fish Passage Improvements



# Fisheries Improvements Example

## Guadalupe Creek Geomorphic Improvements



# Fisheries Improvements Example

## St. John Street Weir Replacement



# Fisheries Efforts

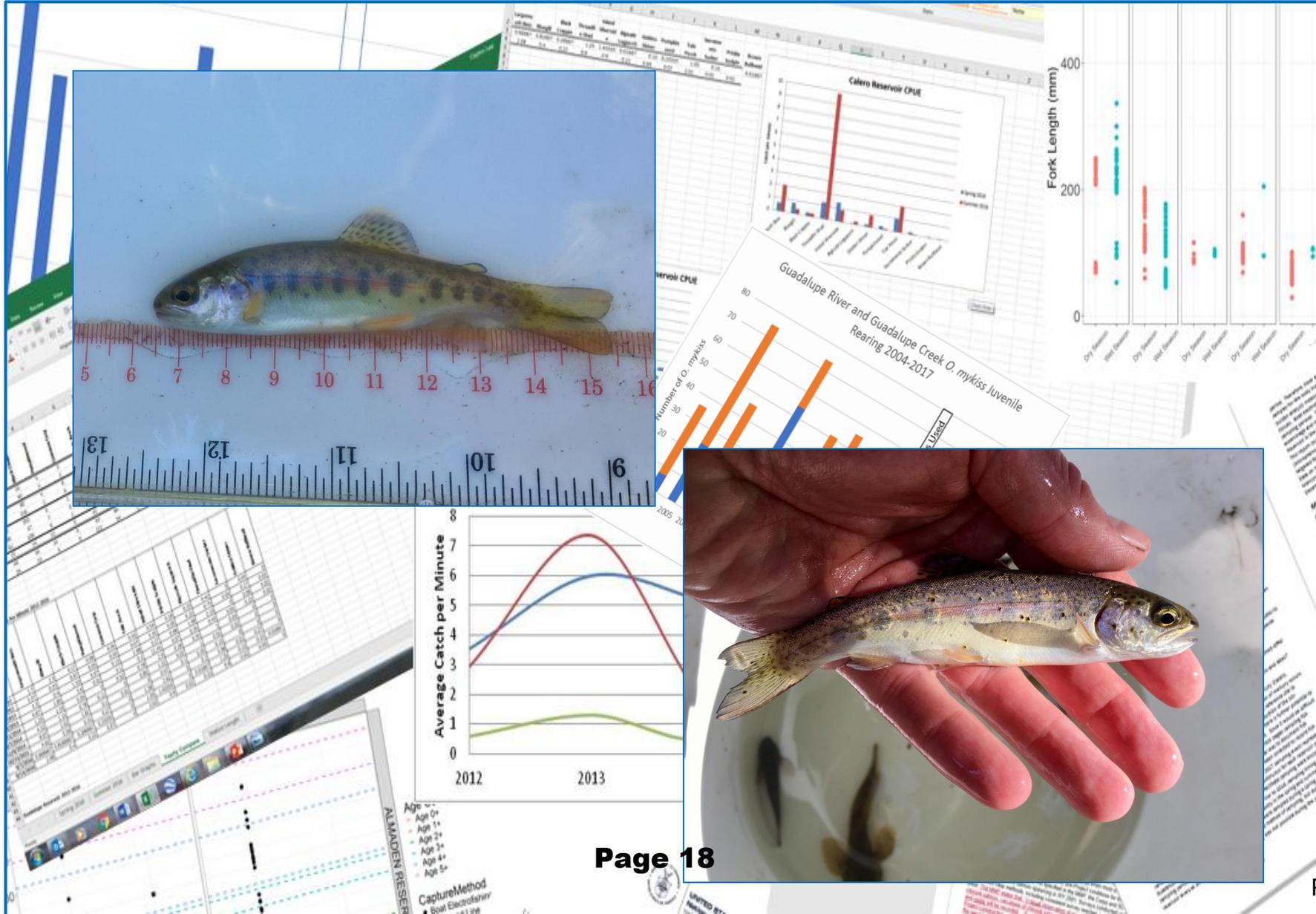
- ✓ Singleton Road Crossing, Coyote Creek (partnering with C. San Jose – studying impediment removal)
- ✓ Ogier Ponds, Coyote Creek (partnering with Santa Clara County – studying creek/lake separation)
- ✓ Metcalf Ponds, Coyote Creek (feasibility study)
- ✓ Coleman Weirs, Guadalupe River (evaluation of passage conditions at the weir)
- ✓ Almaden Lake, Alamos Creek (creek/lake separation project in design)
- ✓ Reach 6 Gravel Augmentation, Guadalupe River (in permitting stage)



# Fisheries Efforts

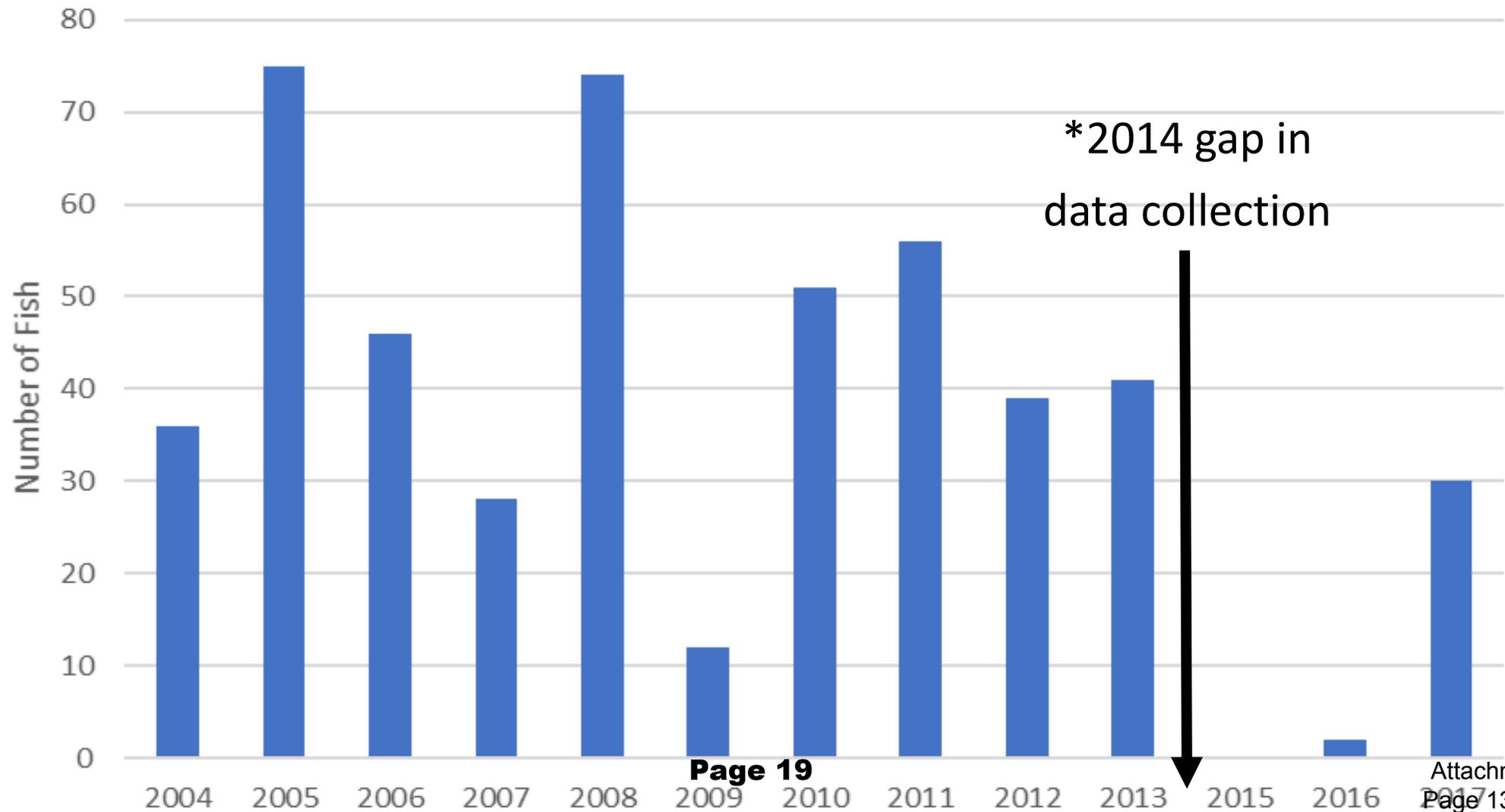
- Safe, Clean Water and Natural Flood Protection Program
- South Bay Salt Ponds Restoration Program
- Fish and Aquatic Habitat Collaborative Effort
- Stream Maintenance Program
- Santa Clara Valley Urban Runoff Pollution Prevention Program
- Fisheries Staff Involved with Project Development

# Understanding Steelhead Monitoring Data



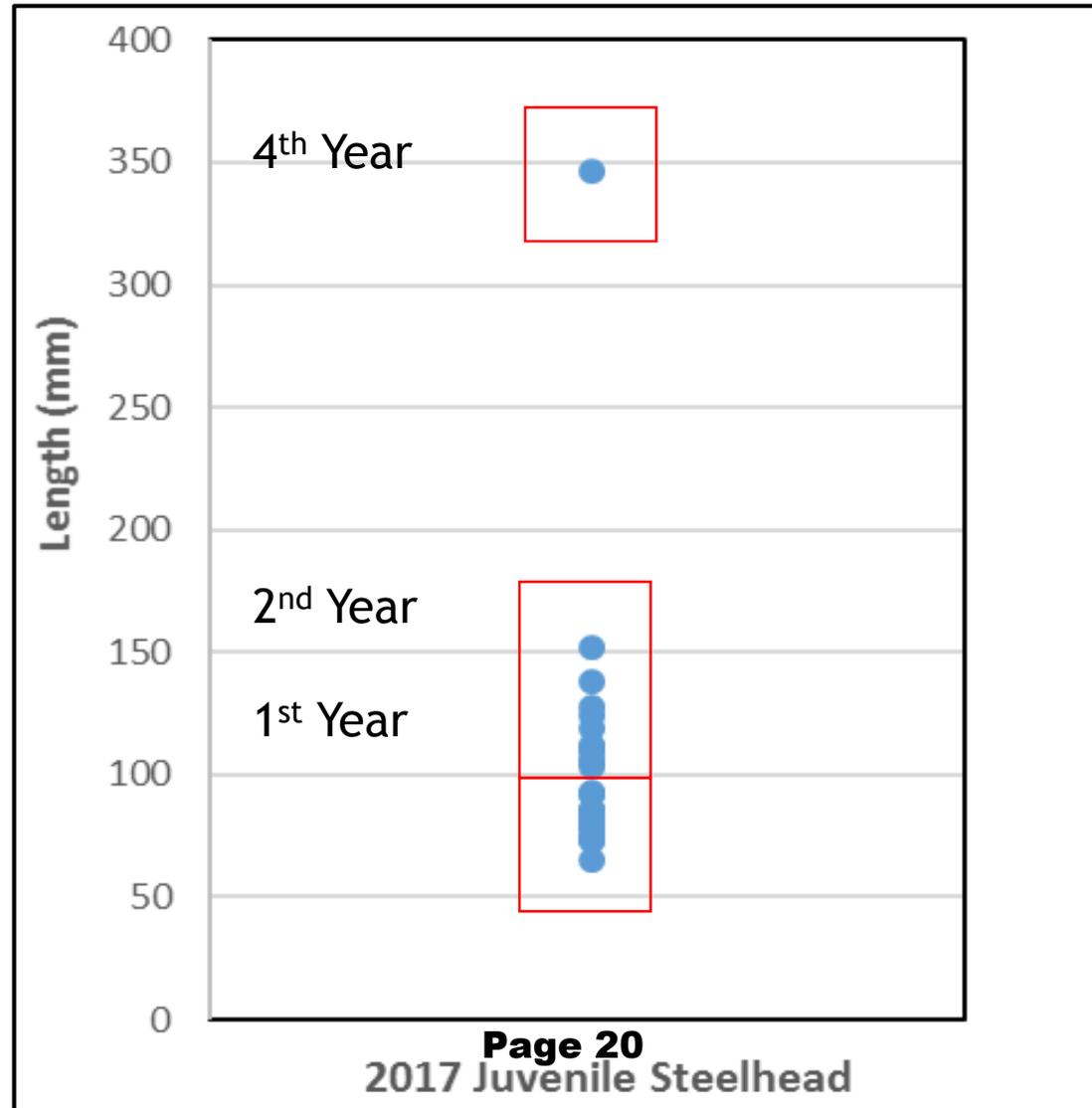
# Guadalupe Watershed Population Fluctuations

## Juvenile Steelhead Rearing Data 2004-2017\*



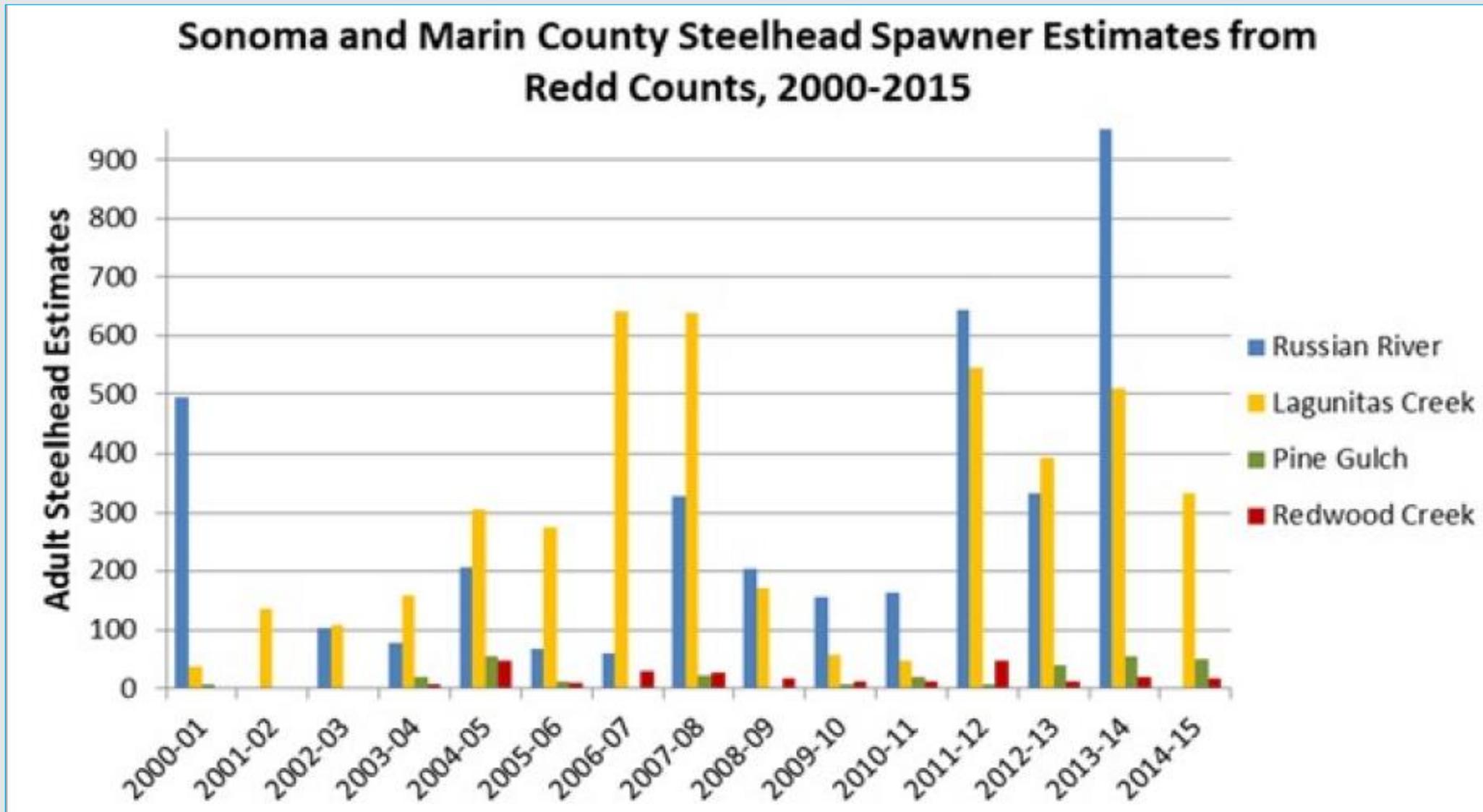
# Not Every Fish is counted

## Juvenile Steelhead Size Distribution



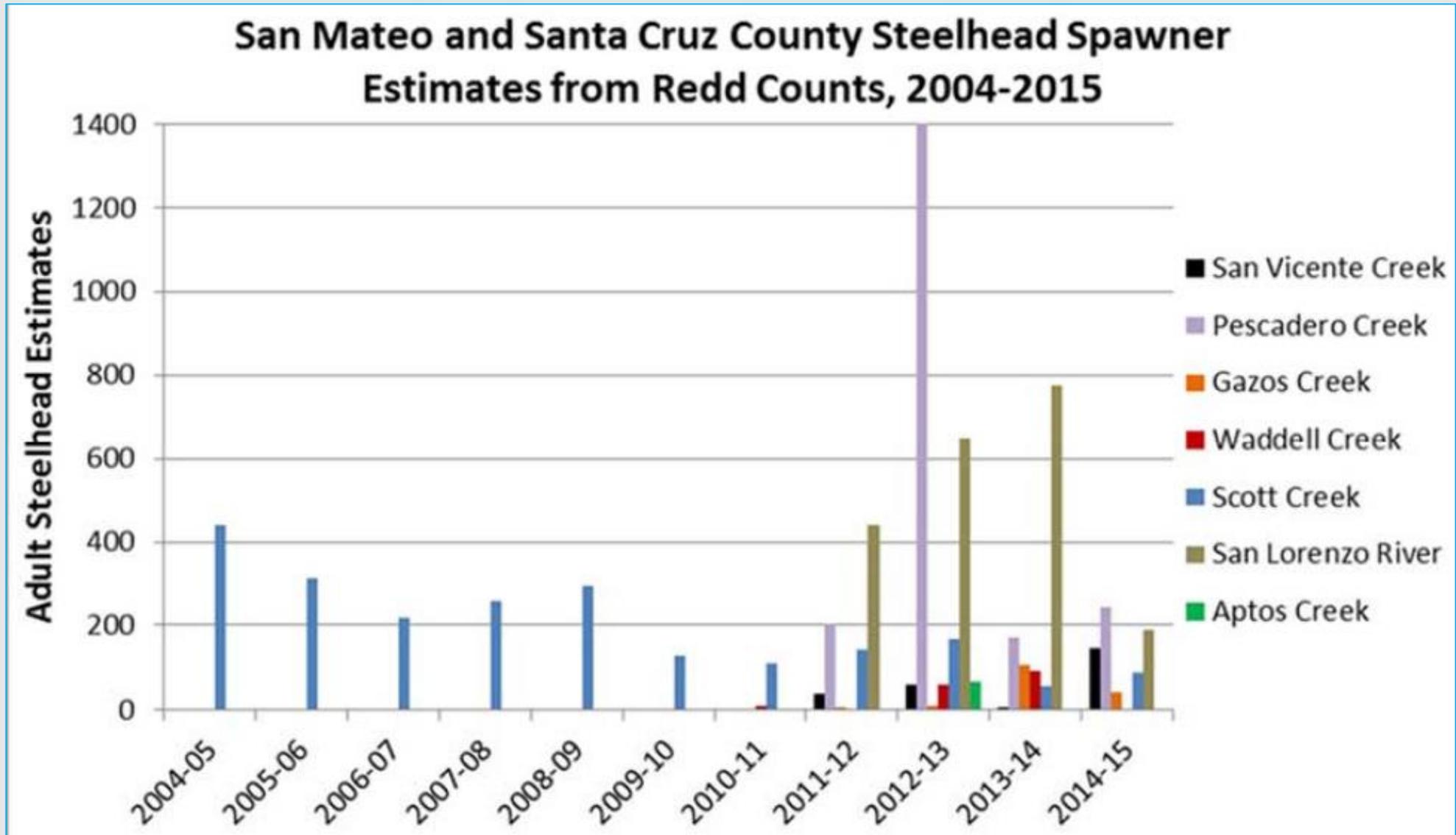
# Regional Steelhead Data

Populations Fluctuate and Zeros Happen



# Regional Steelhead Data

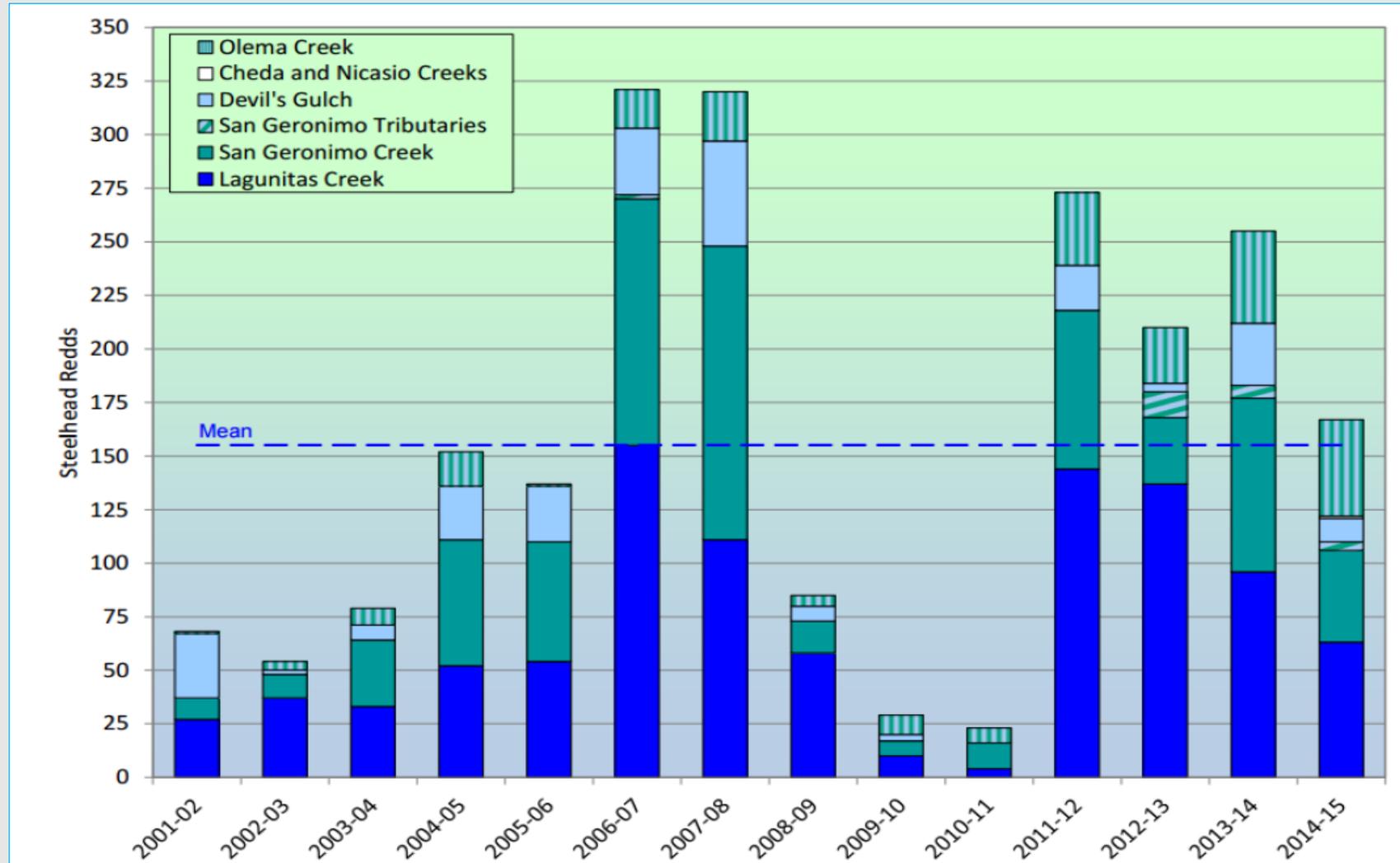
Populations Fluctuate and Zeros Happen



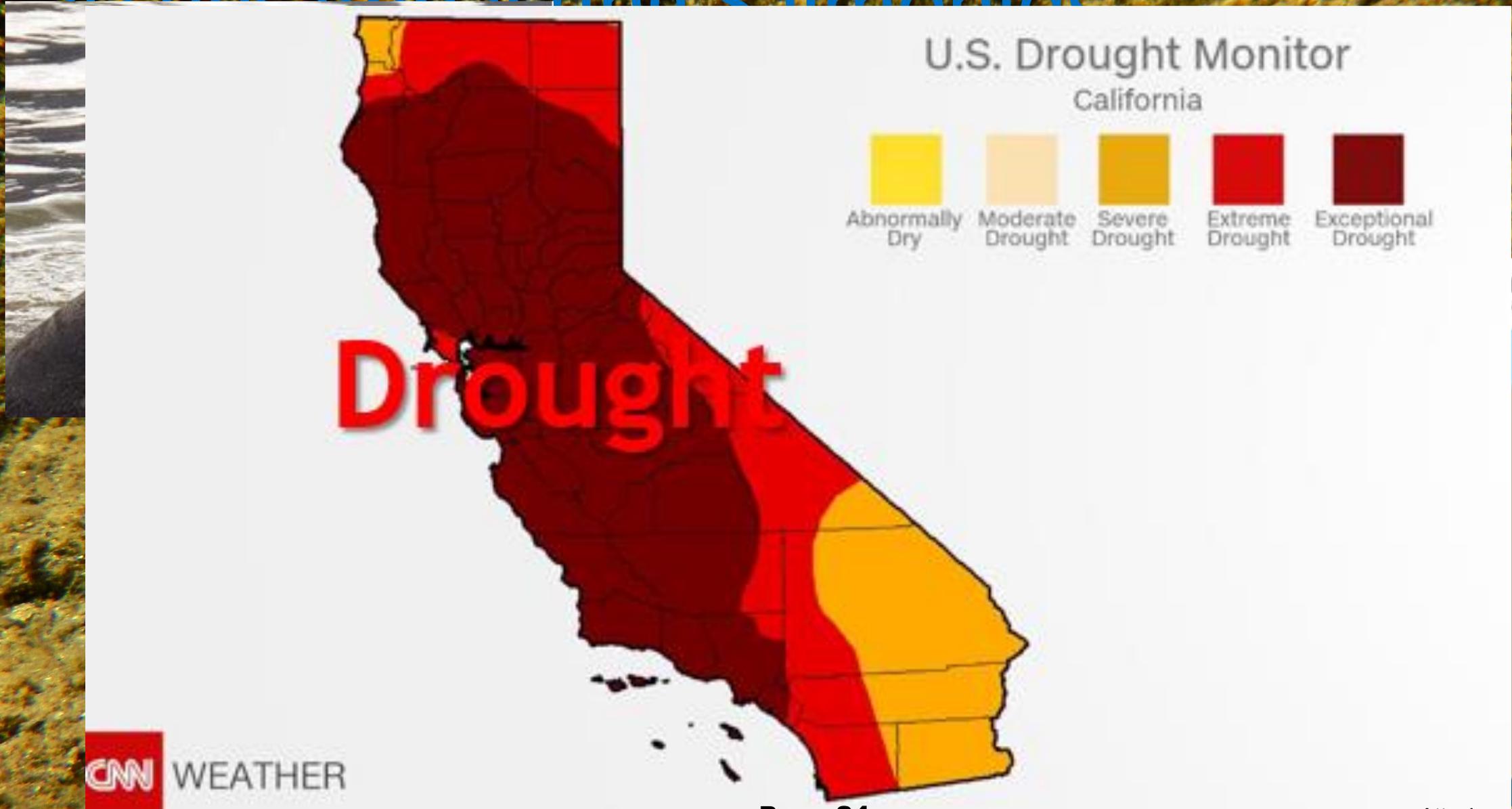
# Regional Steelhead Data

Populations Fluctuate and Zeros Happen

## Marin County Redd Counts, 2001-2015

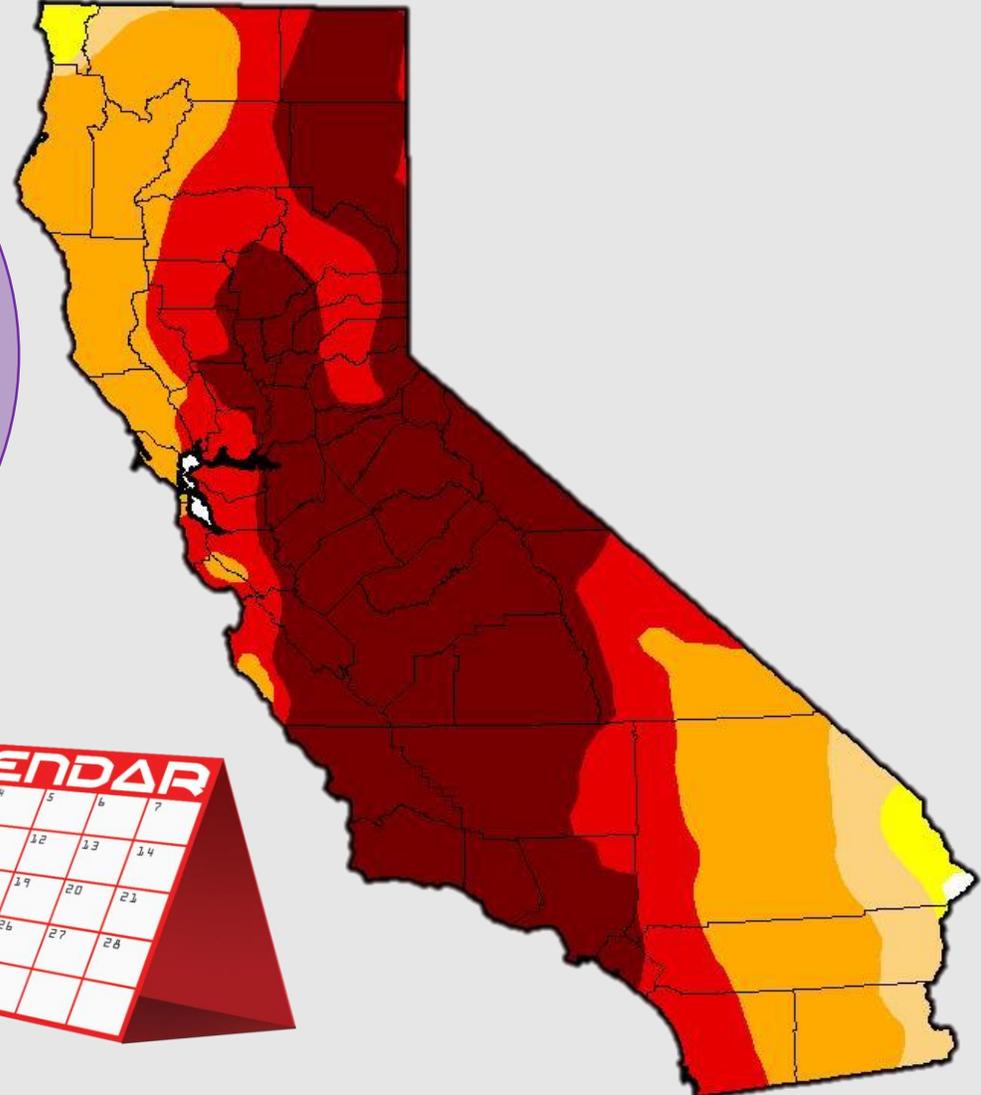


# Issues Impacting Salmonids





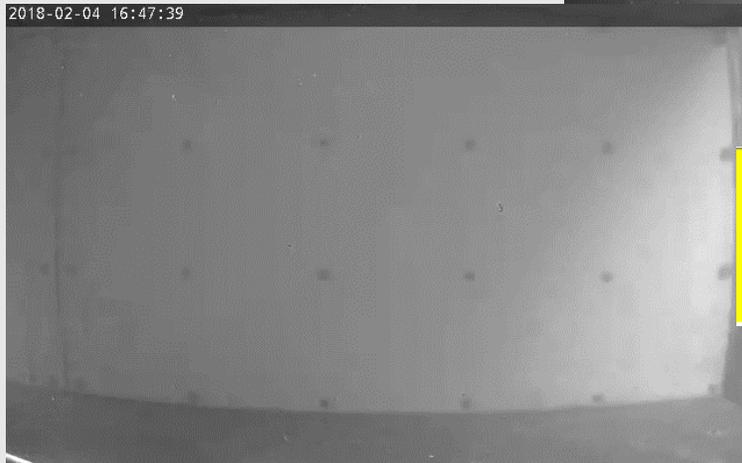
# District's Response to Drought



# District's Monitoring Effort

## Juvenile Rearing Monitoring

- ▶ Tracks juvenile production



## Vaki RiverWatcher

- ▶ Records adult migration



# Conclusions

- Steelhead are a remarkable fish
- Fisheries efforts will Continue
- Surveys do not account for every fish
- Population fluctuations occur
- Monitoring helps answer questions



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# Fish Population Sampling In 2017 on Coyote Creek

Jerry J. Smith, Emeritus Professor  
Department of Biological Sciences  
San Jose State University

17 December 2017

## ABSTRACT

Severe drought and cut-backs in the delivery of imported water via the San Felipe Pipeline resulted in substantial reductions in reservoir and pipeline releases to Coyote Creek from early February 2014 through March 2016. Despite the flow cut-backs, adult steelhead (*Oncorhynchus mykiss*) had access and spawned in Coyote Creek between Ogier Ponds and Anderson Reservoir during the very brief passage window in early February 2014; however, the brief and very early passage window would have prevented almost all steelhead smolts reared in 2013 or 2012 from successfully emigrating in 2014. In 2015, despite more rain and runoff into Anderson Reservoir, the reduced pipeline and reservoir releases that began in February 2014 were continued, and there was no downstream flow continuity to provide adult fish passage. No young-of-year (YOY) steelhead were captured in 2015, and most steelhead reared in 2014 were not found at sampled sites and therefore likely smolted and attempted to emigrate. However, considering the persistent lack of suitable flow conditions in downstream reaches of Coyote Creek, any steelhead smolts that attempted to emigrate would have been trapped in the dry-back zone and/or lost to bass (*Micropterus* spp.) predation in the Ogier Ponds. In 2016, the lack of connectivity continued until the end of March, when large reservoir releases were made for groundwater percolation and to provide for potential immigration of steelhead adults. However, no juvenile steelhead were captured during fall 2016 sampling. In 2017, despite the flood flows in February and high flows through summer, adult access to spawning and rearing areas upstream of Metcalf Pond would have been possible (although difficult) prior to the flood, during very brief windows during the flood, and after 30 March due to damage at the Metcalf Dam. In addition, poor flow/velocity passage conditions at the Singleton Road apron and culverts would have hindered or prevented adult upstream access during much of the migration period.

Spring-fall stream flows in 2017 were mostly between 30 and 70 cfs in the potential spawning and rearing habitat. Most of the flow come from releases from Anderson Reservoir because of seismic-related reservoir storage limits, rather than from a more equal combination of reservoir and San Felipe Pipeline releases as in previous years. Therefore, water temperatures between the reservoir and the Ogier Pond complex were somewhat cooler than in 2014-2016. Releases warmed over the summer as the reservoir was drawn down towards the mid-level release port. The heating effect of Ogier Ponds maintained very warm water temperatures downstream of the ponds (22-25+°C) as observed in 2014-2016. Temperatures downstream of the ponds were

3-6°C warmer than upstream, because of the large heat capacity within the ponds and the discharge of warm surface water from the ponds. The large amount of stored storm water in Anderson Reservoir atypically resulted in relatively turbid releases throughout summer and fall.

Despite brief windows of potential adult steelhead access and suitable rearing conditions in summer and fall 2017, no juvenile steelhead were captured during sampling at four sites in August or October. Apparently, the last potential smolts to successfully emigrate in Coyote Creek were in 2013. The unsuitable flow conditions, and the barrier at Singleton Road, have resulted in passage bottlenecks that have eliminated most or all steelhead production for the past five years, potentially extirpating steelhead.

Improvements to the steelhead population will require removal of the Singleton Road passage barrier and modification of current release strategies during late winter and spring to provide for adult and smolt passage. Stream flow connectivity for successful migration would improve substantially if releases for aquifer recharge were maintained at a level (30-50 cfs) sufficient to reach Metcalf Pond, particularly when leading up to and during larger storm events. In addition to providing aquifer recharge, these releases would connect with storm runoff from Fisher Creek and from substantial suburban runoff, which would then provide connectivity into and through lower Coyote Creek. Additionally, mid-summer through fall releases similar to those in 2016 or early summer 2017 (30-40 cfs), rather than the much smaller releases in 2014 and 2015, would provide more rearing habitat extent and more optimal fast-water feeding habitat. Cooler water, based upon source (reservoir versus San Felipe Pipeline) and release port elevation in Anderson Reservoir, during all or most of summer and fall, would also improve rearing habitat quality. Finally, re-directing the stream around Ogier Ponds is needed to eliminate the water temperature and predation effects of the ponds.

## **INTRODUCTION**

Summer or fall investigations into the distribution and abundance of rainbow trout/steelhead had not been conducted for decades on Coyote Creek in the reach between Anderson Reservoir and Metcalf Pond until electrofishing was conducted between Anderson Reservoir and Ogier Ponds in September and November 2014 (Leicester and Smith 2014b). Despite the dry conditions in 2014, and the substantial reduction in releases to the stream after early February, presence of rearing YOY indicated that adult steelhead accessed and spawned in the reach between Ogier Ponds and Anderson Reservoir. The streambed dried downstream of Ogier Ponds by late June. YOY steelhead were captured at all three sample sites in both September and November, and despite warm late-summer water conditions, they were large enough to smolt and emigrate by spring 2015, especially with good conditions for growth in most of winter and spring 2015.

However, winter and spring conditions were extremely dry again in 2014-15, so stream connectivity was not restored and adult and smolt migration was not possible. Sampling was

repeated in late June-early July, and in November 2015. Almost all YOY fish reared in 2014 had emigrated, but would have been lost during the attempt to the drying stream farther downstream and/or to predatory bass in the Ogier Ponds (Leicester and Smith 2015). A very few yearling steelhead were still present in June. The attempted emigration by *O. mykiss* indicates that the fish were steelhead; there is no resident rainbow trout population in Coyote Creek downstream of Anderson Reservoir. In 2016, connectivity was not restored to allow potential adult or smolt migration until very late March, when high releases were made for groundwater percolation and to potentially allow late-migrating steelhead adults to access upstream spawning and rearing areas. No juvenile steelhead were captured by fall sampling at four sites in 2016.

In 2017, high stream flows provided some windows in January, February and April for potential adult steelhead to access spawning and rearing habitat upstream of Metcalf Pond and the Ogier Pond Complex. However, few adult steelhead were likely because of the impacts of flow conditions in 2014-2016. Electrofishing sampling was conducted in late August and late October to see if there was successful adult spawning and juvenile steelhead rearing in 2017, following two years without steelhead.

## **METHODS**

Data on stream flow and Anderson Reservoir storage were obtained from the Santa Clara Valley Water District (SCVWD) Automated Local Evaluation in Real Time (“ALERT”) website (Anderson reservoir storage, Madrone and Edendale stream gages), and conditions in the streambed were visually assessed irregularly through June. In addition, stream flow conditions upstream of Coyote Reservoir were obtained from the USGS (“near Gilroy”) gage, as an index to upper watershed runoff.

Onset Hobo temperature recorders, that recorded every 30 minutes, were installed in the stream at locations in November 2016, but all but one were lost in the February flood. Seven new loggers were installed prior to 1 May 2017 (Figure 1):

- 1) in Coyote Creek County Park immediately downstream of Anderson Reservoir, installed to start recording on 1 May;
- 2) in the Park downstream of the San Felipe Pipeline discharge location, to reflect the combination of reservoir and pipeline discharges, installed to start 1 May;
- 3) upstream of the Ogier Ponds complex, downstream of the Model Airplane Park, installed to start 1 May;
- 5) immediately downstream of the Ogier Pond Complex, installed to start 1 May;
- 6) downstream of the dead end Golf Course Road, installed to start 1 May; and
- 7) downstream of Coyote Creek Ranch Road, installed to start 1 May.

Temperature recorders 2-7 were removed on 18 November, but recorder #1 had apparently been stolen. An air temperature recorder was installed to start on 1 May near the Highway 152

crossing of Uvas Creek in Gilroy as part of a separate study of the Uvas Creek watershed; it was retrieved on 15 November. This recorder was used as an indicator of air temperatures in south Santa Clara County.

On 28 August, two previously sampled sites (Leicester and Smith 2014b and 2015b; Smith 2016), upstream of the Correctional Facility downstream of the Reservoir, and the site immediately downstream of Anderson Reservoir were sampled by electrofishing. On 26 October two other previous sites, upstream of Ogier Pond #1 and downstream of the Golf Course Road (downstream of Ogier Ponds), were also sampled, to assess fish populations, primarily in the habitat upstream of Ogier Ponds where steelhead were captured in 2014. Stream flow during the August sampling was approximately 45 cfs, and stream flow during October sampling was approximately 70 cfs (Figure 5). Two pass electrofishing was conducted to provide depletion population estimates, but no *O. mykiss* were captured. Approximately the same habitats were sampled at three of the resampled sites as in 2014, 2015, and 2016, but some slower, deep habitats could not be sampled because of the much higher stream flows in 2017. At the site upstream of Ogier Pond #1, the stream had abandoned its previous channel at the sample site and was braided farther downstream, so new and more extensive representative habitats were sampled in both habitats. A total of 1440 feet of stream was sampled among the four sites.

Fish were identified to species, lengths (fork length, FL) measured, and were released in or near the habitat in which they were collected.

## RESULTS AND DISCUSSION

### Streamflow Conditions

**Stream flow Conditions in 2017.** In early January through February extremely large storms produced record runoff in the upper Coyote Creek watershed (Figure 2). From October through 9 January releases from Anderson Reservoir slowly declined from about 50 to 20 cfs (Figure 4) to conserve water following the severe 2013-2015 drought, with the reservoir having only about 27,000 acre-ft of storage at the start of the intense storms. With the start of the storms the SCVWD began releasing at the maximum capacity of the outlet, increasing releases to about 370 and then to 525 cfs as the reservoir depth (and hydraulic head) increased (Figure 4). Runoff from the upper watershed far outpaced the ability to release water from the reservoir, and the reservoir filled and began to spill on 18 February (Figures 3 and 4), with spilling (and bottom release) reaching approximately 7,300 cfs on 21 February. Flows from the reservoir declined to 600 cfs by 27 February and gradually declined to 400 cfs (with the maximum bottom release) through late April (Figures 4 and 5); seismic rules required lowering the reservoir storage. Two brief reductions of releases were made: the first in early February to lower or remove dam panels at Metcalf Pond and the second in late May to modify the fish ladder at the dam for fish passage at the reduced pond water level (Figure 4). Releases from the reservoir and the San Felipe Pipeline gradually declined to almost 30 cfs by early July before



increasing to about 45 cfs from mid-July through most of September. Releases then fluctuated between 50 and 70-90 cfs in October and November to accommodate infrastructure repair and pond filling at Metcalf Pond and to draw down the reservoir by December to provide very conservative flood capacity (Figure 5; Photos 7-9). The flood flows washed out the road downstream of Ogier Pond #1 (to the Model Airplane Park; Photo 16) and severely damaged the bridge at Coyote Ranch Road. In addition, it rerouted the main channel and produced braided channels upstream of Ogier Pond #1 (Photos 14 and 15) and greatly widened the outlet channel from Ogier Pond #4 (Photo 17)

The releases in January would have provided potential passage through the ladder at Metcalf Pond. However, the unprecedented storm flows in February required lowering the dam panels and opening the radial gates at Metcalf Dam (“Coyote Percolation Pond”). The fish ladder operated briefly during the peak on 21 February, but adult steelhead would have been unlikely to locate the ladder during the peak. Fish passage would probably not have been possible over the apron or through the radial gates at the Metcalf Dam between 19 February and 30 March, when the fish ladder was modified to function with the lowered pond level. Even after 30 March, steelhead might have had problems locating the ladder among the high flows dispersed among the dam apron and the left bank ladder in April. In October the dam panels were reinstalled, the damage to the supporting apron was buttressed with grouted boulders, and a set of grouted boulder weirs were constructed between the down-cut channel downstream of the dam and the fish ladder (see photos 1-9).

Early January through mid-April stream flows farther downstream on Coyote Creek would have provided potential adult steelhead passage everywhere except at Singleton Road which is a major steelhead passage barrier (Figures 6 and 7). The high releases from the reservoir probably restricted passage at Singleton Road because of high velocities over the apron of the road crossing and through the two culverts. Only fish moving during the peak of the flood, which submerged the crossing, would have been likely to pass easily. Only in late April and May, after the migration/spawning period, would flows have declined enough to allow potentially marginal passage through the culverts (see photos 10-12). Even without the passage problems at Metcalf Pond, steelhead access to spawning and rearing habitat would have been very difficult during and after January.

**Streamflow Conditions 2014-2016.** -- All late spring through fall stream flow, and almost all of the winter stream flow, in the potential steelhead rearing reaches downstream of Anderson Reservoir is provided by releases from Anderson Reservoir and from imported water from the San Felipe Pipeline (San Luis Reservoir water). Year-round releases from these sources are used for groundwater percolation, and in April through September of 2013, releases were usually 37 – 55 cubic feet per second [cfs] (as reported by the SCVWD Alert Gage for the Madrone stream gage); that magnitude of releases had been typical of operations for the last 15 years. However, the releases after February 2014 and in 2015 were substantially curtailed because of severe reductions in Bureau of Reclamation deliveries to the San Felipe Pipeline due to the ongoing severe state-wide drought (Leicester and Smith 2014b and 2015b). A State Water Board decree restricted all Delta contract water to municipal and industrial use, stopping agricultural

deliveries and general groundwater recharge. For the Coyote Creek watershed, this meant a shift from groundwater percolation to direct pipeline delivery of water to the water treatment plant for distribution to water retailers. This resulted in stream flows that were reduced from an average of 30 – 37 cfs in December 2013 - January 2014, to 13-15 cfs from early February 2014 through mid-June, and 8.0 – 9.0 cfs from mid-June through November 2014 (Leicester and Smith 2014b). Except for storms in December 2014 and February 2015, stream flows then remained in the 8 – 9 cfs range through mid-November 2015 (Leicester and Smith 2015b). Releases then increased slightly in mid-November to 14-15+ cfs, when the San Felipe water not imported during the pipeline interruption was recovered for SCVWD use. Those flows continued through late March 2016.

Storms in mid-December 2014 produced stream flows above Coyote Reservoir of more than 2000 cfs, and a brief storm in early February produced stream flows of approximately 1800 cfs (Leicester and Smith 2015b). Runoff increased Anderson Reservoir storage from about 34,000 acre feet (AF) to 46,000 AF from December through May. Despite the increased storage, releases from the reservoir and from the San Felipe Pipeline remained unchanged through winter and spring 2014-15 at 8-9 cfs. Local runoff from the December and February storms only slightly increased stream flow at the Madrone stream gage 1.5 miles downstream of the reservoir to 16 cfs in December and 12 cfs in February (Leicester and Smith 2015b). A small amount of local runoff was added farther downstream, and surface flow in Coyote Creek extended to downstream of the Golf Course. However, monitoring of the streambed after the storms indicated that neither storm resulted in extension of surface flow to Bailey Avenue. The Edenvale stream gage farther downstream, which is subject to runoff from Fisher Creek near Bailey Avenue and to flashy suburban runoff during storms, recorded brief runoff of approximately 200 cfs in late November, 165 cfs in December, and 40 cfs in February (Leicester and Smith 2015b). However, the low and steady releases from the reservoir and the pipeline did not provide a surface flow connection to the downstream storm runoff. In addition, the radial gate at the Metcalf Pond was closed during the late portion of the February runoff; therefore passage was not possible through the fish ladder at the partially filled pond. No potential adult steelhead or smolt passage was possible in winter/spring 2014-15 (Leicester and Smith 2015b).

In 2014, stream flow downstream of the Ogier Pond complex was eliminated by 20 June, but in 2015, flow below the Ogier Ponds was eliminated by 20 April. The most downstream Ogier Pond (#4) dried in both years.

In 2015, releases to Coyote Creek were generally about 2/3 from the San Felipe Pipeline and 1/3 from the reservoir (Leicester and Smith 2015b). However, the San Felipe Pipeline had to be shut down for repair from 1 August through 12 September. During that period, the 8-9 cfs discharge to the creek was maintained, but came entirely from the reservoir.

In winter 2016 there were two storms in January and two larger storm periods in early to mid-March (Smith 2016). The January runoff increased water stored in Anderson Reservoir from

about 30,000 AF to 40,000 AF. The larger March storms increased storage to over 55,000 AF, and additional water was stored during both periods farther upstream in Coyote Reservoir. Despite the large gains in storage in January and March, releases from the reservoir and the San Felipe Pipeline to Coyote were maintained at only about 15-17 cfs until the end of March. The releases into Coyote Creek produced surface flow only downstream to about 1 mile upstream of Bailey Avenue. During both January and early March, runoff from impervious surfaces in the suburbs near and downstream of Metcalf Pond produced brief and modest (38 and 49 cfs) runoff peaks at the Edenvale Gage, with larger stream flow increases farther downstream from more extensive suburbs. In addition, runoff was produced in January and March in Fisher Creek, which discharges to Coyote Creek upstream of Metcalf Pond, but downstream of the dry streambed up and downstream of Bailey Avenue during the storm periods. If releases from the reservoir had extended flows to fill Metcalf Pond during those periods, connectivity throughout Coyote Creek would have allowed potential adult steelhead immigration.

Large releases (which reached 140 cfs) from the Reservoir and the San Felipe Pipeline for groundwater recharge and adult steelhead passage were begun in late March (Smith 2016), with releases recharging the upstream aquifer and progressively extending surface flow downstream. Metcalf Pond was nearly full on 26 March and spilling about 25 cfs through the fish ladder on 28 March. By 1 April stream flow sufficient to allow adult steelhead passage had reached throughout the lower Coyote Creek channel, and connecting flow was maintained for much of April. Late-migrating adult steelhead should have been able to reach spawning and rearing areas upstream of the Ogier Ponds, although the culverts at Singleton Road may have made passage difficult.

Releases were cut back to about 60 cfs in mid-April and gradually declined to about 50 cfs by the end of October (Smith 2016). Much of the released water over the summer was from Anderson Reservoir, because of interrupted deliveries of Central Valley (San Felipe Pipeline) water. The reduced releases after the large release for adult passage maintained the flow to downstream of Metcalf Pond (which has a bypass requirement), but connectivity for potential smolt or adult emigration passage ceased by late April. The summer releases were generally similar to those that supported large-scale groundwater recharge prior to drought-induced flow cutbacks in February 2014 (Leicester and Smith 2014b).

## **Water Temperature Conditions**

**Temperature Conditions in 2017.** Anderson Reservoir releases directly downstream of the dam and through the pipeline a short distance downstream (dominated by reservoir water throughout the summer) varied by only 0.5-1.5°C daily, but showed a major seasonal shift (Figure 7). Mean temperature was less than 15°C in May, but gradually increased to 18°C in mid-September. Temperature increased more quickly to 19.5°C in late September and early October, before declining to less than 18°C in late October (Figure 7); the decline coincided with exclusive releases from the reservoir while the San Felipe Pipeline was off-line for inspection. There was a one week spike in temperature to 18.5°C in late May when the source of releases

was being adjusted. (Figure 7). Peak temperatures of releases were about 1.5°C cooler than in 2015 and 2016 and occurred for a somewhat briefer period.

Farther downstream above the Ogier Pond complex water temperatures varied 2-3°C daily and had warmed somewhat, despite the relatively high stream flows that buffered against warming (Figure 8). The daily variation was less than in 2014 and 2015, when variation was 5°C, with much lower releases (Leicester and Smith 2015b). Rather than climbing gradually throughout the summer, mean temperature climbed from 16°C in early May to 18.5°C by mid-June and only to 19°C by September, before declining to 17°C by the end of October (Figure 8). This same general pattern of early rise and relatively stable over the June to September period occurred for all downstream sites (Figures 8-11) and was similar to that of air temperature (Figure 7), which apparently controls seasonal temperature progression in the stream. Mean temperatures were only 0.5-1.0°C warmer than below the reservoir in May through August, and the seasonal peak was actually lower, with air cooling downstream in September (Figure 8).

Immediately downstream of the Ogier Pond complex daily temperature variation was substantially lower (1-1.5°C) and mean temperatures were substantially higher (Figure 9), due to the heating effects in the pond, especially at the pond surface, the source of outflow from the pond. Mean water temperatures were 19°C in May and climbed to 25°C by mid-June (with maximums above 26°C) and then declined to 23.5°C by mid-September and 17-19°C in October (Figure 9). There was no overlap in water temperatures up and downstream of the Ogier Pond complex before mid-September, and mean temperatures were 3°C to more than 6°C higher downstream of the ponds (Figure 9), even more than the heating effect in 2016 (Smith 2016). As in 2016, the temperatures downstream of the ponds are likely to be consistently 22-25°C in summer regardless of the water temperature upstream of the ponds because of the large heat capacity and heating effect within the ponds (Leicester and Smith 2014b and 2015b; Smith 2016). The lower daily variation in outflow temperature in 2017 may be related to the wider opening at Ogier Pond #4 eroded by the February flood (Photo 17).

Farther downstream of the ponds, at the Golf Course Road, diurnal variation was 3-4°C, and mean water temperatures were 22-25°C from mid-June to mid-September. With maximums above 26°C in June (Figure 10). These were similar to those in the pond outflow, although in 2016 means were actually slightly lower (0.5-1.0°C) than the pond outflow temperatures. Even farther downstream, at Coyote Ranch Road, the water temperatures were nearly identical to those at the Golf Course Road (Figure 11). The effects of the ponds makes water temperatures downstream of the Ogier Ponds unsuitable for rearing steelhead unless food is unusually abundant and available.

The major water temperature issue in 2014 (Leicester and Smith 2014b) and 2015 (Leicester and Smith 2015b) was the sustained release of relatively warm water to Coyote Creek from the San Felipe pipeline and/or from Anderson Reservoir. This occurred despite a pool of cool water in the lower level of the reservoir that could have been utilized to maintain much cooler stream temperatures if the inflow to Coyote Creek had come solely from the near the bottom of the reservoir. With the additional stream flow and much longer wetted channel in 2016 and 2017

(and prior to 2014), then the additional major water temperature issue is the heating effect of the Ogier Ponds. If release temperatures are reduced in late summer, the warm surface water outflows from these large ponds will still result in temperatures downstream that would be similar to those seen in 2016 and 2017. Those temperatures would severely affect rearing quality for juvenile steelhead in the long reach between the Ogier Ponds and Metcalf Pond.

**Temperature Conditions in 2014-2016.** In 2014 and 2015, with the cut backs in releases and stream flow extending only as far as Ogier Ponds in summer, the temperature analysis was limited to that of releases and changes down to and through the first two Ogier Ponds for most of the years (Leicester and Smith 2014b and 2015b). In 2016 and 2017, the restored percolation releases allowed analysis under higher flow conditions and downstream through all four Ogier Ponds and to just above Metcalf Pond.

Air temperature patterns were similar in all three years (and in 2017), with general increases from April through June, relatively level means through August, and then gradual declines through October (Figure 6). Throughout the study period there were alternating periods of cooler and warmer conditions, with sharp contractions of temperature ranges during cooler, more overcast conditions. Peak air temperatures during warm periods were 30°C to more than more than 35°C, with maximums in 2015 generally somewhat higher than in 2016 (Leicester and Smith 2015b and Smith 2016). Air temperature means during June through August in both years were 20-21°C.

Water temperatures downstream of Anderson Reservoir and the San Felipe Pipeline had narrow (1°C) temperature ranges in all three years (Leicester and Smith 2015b and Smith 2016). In 2015 mean water temperatures increased from 14°C in mid-April to 16°C by early August, then increased sharply to above 20°C for early September through October, before declining sharply after late October (Leicester and Smith 2015b). In 2016 mean temperature increased from 13 °C in mid-April to 14.5°C at the beginning of July, then increased very sharply to 20°C, before sharply declining to 16.5°C a week later, as releases shifted from predominantly San Felipe water to a blend of Anderson Reservoir water and San Felipe water that was both discharged to the stream and delivered to the water treatment plant (Smith 2016). Temperatures then climbed to 20°C by the beginning of August, one month earlier than in 2015, as the draw-down of Anderson Reservoir lowered the thermocline to the level of the mid-elevation multiport release (Smith 2016). Means stayed 20-20.5°C until a slow decline to 19°C through October. The similar water temperatures in September of the three years provide the best month to compare downstream temperature changes.

In 2015, temperature ranges in summer at the site upstream of Ogier Ponds were usually about 5°C (Leicester and Smith 2015b). In 2016, with stream flow increased from about 9 to more than 50 cfs, the temperature range was less than 3°C (Smith 2016). In 2015, means upstream of the Ogier Ponds were 20-21°C in June through September, with maximums often 23-24°C (Leicester and Smith 2015b). In 2016, with the greater flow volume, the means and maximums were cooler; the mean in July was 17.5°C, the mean in August through September was 19.5°C, 0.5-1.5°C cooler than in 2015. Maximums were usually less than 21.5°C, 1.5-2.5°C cooler than in

2015 (Smith 2016). Means in August and September were actually 0.5-1°C cooler than at the site near the reservoir and pipeline discharges (Smith 2016).

In 2015, in the outflow from Ogier Pond #2, mean water temperatures were 17°C in early April, climbing to 22°C in May (Leicester and Smith 2015b). Mean temperatures reached 24-25°C in mid-June through August, and didn't drop below 20 °C until late October. In 2016, mean temperature climbed from 17°C at the beginning of May to 20°C by June and 22.5°C by the beginning of July (Smith 2016). By the beginning of August the mean was 22°C and declined to 21 °C by late September; means in October were 18-18.5°C (Smith 2016). Temperatures downstream of the first two Ogier Ponds were about 3-4°C warmer than upstream of the ponds in 2015 (Leicester and Smith 2015b) and 2-2.5°C warmer in 2016 (Smith 2016), due to discharge of surface-heated pond water, while the cooler (and denser) inflows to the ponds went to lower levels in the pond. Warming through the first two ponds was apparently somewhat reduced by the substantially higher stream flow in 2016 (and slightly cooler air temperatures). However, the thermal effects of the ponds have sufficient surface heating capacity to overcome much of the thermal mass of the inflow at most operational flows. Diurnal variation was less below the ponds than at upstream stream sites due the larger volume of warm water in the ponds which had a buffering effect against nighttime cooling (Leicester and Smith 2015B and Smith 2016).

In 2015, immediately downstream of the fourth pond in the Ogier Pond sequence, water temperatures during March and April were about 1°C warmer than below Pond #2, before the pond level dropped and the stream dried (Leicester and Smith 2015b). In 2016, mean water temperatures below the fourth pond reached 22-24°C in August through September (Smith 2016), and were 1-1.5°C higher than in the outflow from Ogier Pond #2. Therefore, more of the heating by the Ogier Pond complex occurred in the first two ponds, but the overall heating by the four ponds was 3-4°C in June – October.

Farther downstream in 2016, near the Golf Course, diurnal temperature variation increased to about 2°C, but mean water temperatures (21-23°C in June through August) actually cooled 0.5-1°C compared to the outflow from the ponds (Smith 2016). Maximum water temperatures were similar (23-24 °C) to the site immediately downstream of the ponds. Upstream of Metcalf Pond at Coyote Ranch Road, diurnal variation increased to 3-4°C, mean temperatures were similar to those at the golf course, but maximum temperatures reached 24-25°C (Smith 2016).

### **Substrate and Turbidity**

Turbidity level in Coyote Creek was relatively clear (visibility > 120 cm) in 2014-2016 compared to that of other Santa Clara Valley streams downstream of reservoirs (Casagrande 2010; 2014; Leicester and Smith 2014a). In the smaller reservoirs, like Uvas and Stevens Creek, turbid storm water makes up most of the volume and remains suspended in the reservoir for much of the spring and is deposited on the streambed downstream with releases in spring. Sediment can also be deposited from turbid releases in late summer and fall, when the reservoirs are substantially drawn down. Anderson Reservoir is an order of magnitude larger than either of

the smaller reservoirs, has usually been more than one-third full at the start of winter, and in most years winter runoff less than doubles the stored volume. Fine sediment in storm water tends to be diluted and settled in spring, and spring turbidity is therefore much lower in releases from Anderson Reservoir. Release water was observed to be clear in March 2014, February 2015, and April 2016; on 15 April 2016, even with significant winter storms, visibility downstream of the reservoir was 65 cm and at the Golf Course it was 89 cm. In addition, the usually high summer releases in 2016, and prior to 2014, apparently rinsed most fine sediments off the streambed, at least in most habitats except large pools. In 2014-2016, substrate in riffles and fast runs was clean, and slower runs, glides and smaller pools had much less fine sediment than observed in Stevens Creek and much of Uvas Creek. The relatively clean substrate can potentially maintain much higher numbers of aquatic invertebrates (Kaller and Hartman 2004; Foster 2014). In particular, Hydropsychid (net-spinning) caddisflies and Baetid mayflies were abundant in 2016. The relatively clear water should also improve fish feeding efficiency (Barret et al. 1992).

In 2017, the near record winter runoff to Anderson Reservoir was more than four times the storage prior to the storms, so the entire stored volume of the reservoir was atypically turbid, similar to the usual annual condition in the smaller reservoirs. Even though the peak of the storm runoff in the upper watershed was over by March, turbidity in the reservoir persisted into summer. On 2 May visibility in Coyote Creek immediately downstream of the reservoir releases was only 15 cm, and downstream of Ogier Ponds at the Golf Course visibility was only 17 cm. By 23 July visibility below the reservoir had only improved to 40 cm and visibility at the Golf Course to only 48 cm. Even by 18 November visibility had only improved to 50 cm below the reservoir and 85 cm at the Golf Course; water in November 2017 was still more turbid than on 15 April 2016.

There are no significant tributaries between Anderson Reservoir and Metcalf Pond, and Anderson Reservoir has blocked gravel recruitment for more than 60 years. Gravels in the range of 25 – 75 mm were relatively scarce in 2014-2016, and spotty in their distribution, including at the tails of pools and glides where steelhead spawning normally occurs. Large cobbles were common at pool tails and in riffles and runs, but they are too large to provide suitable spawning substrate. Suitable spawning gravels were present in the floodplain, but they are normally not available for spawning or recruitment to the active channel except during severe floods, which were largely prevented by the dam. However, the 2017 flood was sufficient to spread over the flood plain, move bank gravels into the channel to improve spawning conditions, and rearrange some channel configurations. Upstream of Ogier Pond #1, a significant part of the main channel was moved to an old flood plain channel (Photo 14). The unshaded but reoccupied old channel has abundant cobbles and well-distributed gravels. Even where the stream generally remained in the vegetated recent channel, it occasionally braided into multiple channels (Photo 15).

## Shade and Algal Growth

The usually perennial flows, and scarcity of significant floods and scouring flows occurring downstream of Anderson Reservoir, have allowed the density of riparian trees to increase substantially (Grossinger et al. 2006). The original sparse sycamore alluvial woodland has been converted to a dense mixed riparian forest. Western sycamores (*Platanus racemosa*) are still present along the stream, but are now joined, and far outnumbered, primarily by willows (*Salix* spp.), but also by box elder (*Acer negundo*), and cottonwood (*Populus balsamifera*). The resulting shade reduces water temperatures, but has other potentially undesirable effects on aquatic habitat. Densely shaded habitats can reduce feeding efficiency by steelhead, just as turbidity can. Shading also reduces growth of algae, which provides food and substrate for aquatic invertebrates (Hill et al. 1995; Foster 2014). Algae was generally only a thin coating on the rocks at the sites sampled in 2014-2016. Algae was more abundant at Coyote Ranch Road in 2016. However, even in sunnier areas algae appeared relatively scarce, which might also be due to low nutrient levels in the controlled releases from the reservoir and from the pipeline. Anderson Reservoir may have low nutrient levels, at least in the middle water column where the releases have come from, because of its depth and because Coyote Reservoir, upstream, may trap many of the nutrients coming from upper Coyote Creek.

The turbid water in 2017 probably reduced the sparse and shaded algae. However, the new unshaded channel upstream of Ogier Pond #1 is likely to provide greatly enhanced algae and invertebrates next year; it may provide the best potential steelhead rearing habitat.

## **O. mykiss** Sampling Results

All captured *O. mykiss* in 2014 ( $n = 52$ ) were found to be young-of-year (YOY) based on scale analysis. Sizes ranged from 85 to 124 mm SL long (Leicester and Smith 2014b and Figure 13). These were judged to be steelhead, because all were good-sized YOY. They were expected to grow enough in winter and spring to smolt and attempt to emigrate in spring 2015 (Leicester and Smith 2014b).

No YOY *O. mykiss* were captured or observed during sampling of the same three sites in 2015, reflecting the lack of adult steelhead access in either the December or February storm events. Most of the fish present in 2014 were apparently gone; only a single large yearling (250 mm) was captured (Figure 13) and a similar-size fish observed, but not captured. The large size of the single yearling captured in 2015 supports the prediction made in the 2014 report that fish captured in 2014 would grow well enough over winter and spring to be able to smolt and emigrate the following spring. The lack of additional captures or observations of larger fish indicates that almost all of the 2014 YOY steelhead attempted to emigrate. However, because there was no stream flow continuity through the passage corridor, emigrating smolts would have been lost to predation by bass (*Micropterus* spp.) in the Ogier Ponds or trapped and killed by the dry-back in the disconnected channel downstream of the ponds. In 2014 a single *O. mykiss* estimated at 300 mm SL was observed but not caught (Leicester and Smith 2014b). Based upon the size of the yearling captured in 2015, that 2014 fish was probably also a



yearling steelhead. Adult steelhead access, spawning, and rearing probably occurred in 2013, based upon stream flow conditions. Therefore, the scarcity of yearling fish in 2014 indicates that most fish reared in 2013 also smolted and attempted to emigrate in 2014 (Leicester and Smith 2015b). The attempts would have been unsuccessful because of flow cut-backs after mid-February.

In 2016 and 2017, no *O. mykiss* were captured or seen at any of the four sampled sites. Therefore, although potential passage stream flows had been provided in early April in 2016 and possibly in January, briefly in February, and April in 2017, apparently no adults accessed and/or spawned in the habitats used in 2014. The available passage in April 2016 and 2017, compared to the dominant late December to early April migration period (Shapovalov and Taft 1954), may have been a problem. Steelhead studies on the central coast found lower adult numbers and few late migrating and spawning steelhead in 2016 (Joseph Kiernan, NOAA Southwest Fisheries Science Center; and Jon Jankovitz, California Dept. Fish and Wildlife, pers. comm.). However, it may also be that with smolt or adult passage problems in 2014-2015 there were few or no potential returning adults produced in either 2016 or 2017. The very few yearlings present in 2015 may have been able to emigrate during the brief passage window provided by the pulse flows in April 2016.

### **Other Fishes**

In 2014-2016, prickly sculpin (*Cottus asper*) and Sacramento sucker (*Catostomus occidentalis*) were the only native fish caught at all three sites upstream of Ogier Ponds, but hitch (*Lavinia symmetricus*) were present at the two sites nearest Anderson Reservoir (Leicester and Smith 2014b and 2015b; Smith 2016). Hitch were more common at the upstream sites in 2016. In 2017, all three native species appeared to be less abundant, except in calmer secondary channels; they were probably reduced by the flood.

Juvenile spotted bass (*Micropterus punctulatus*) and largemouth bass (*M. salmoides*), were present at all three sample sites in 2014 and 2015, but were less abundant in 2015 (Leicester and Smith 2015b). In 2016, bass were almost absent at the three sites upstream of the Ogier Ponds, apparently because of the pulse flow in late March and April and the higher flows throughout the remainder of the year (Smith 2016). Common carp (*Cyprinus carpio*) and bass (115-275 mm FL) were common at the Golf Course sample site in 2016. The site was dry in summer 2014 and 2015, and the fish had apparently been rinsed down from the Ogier Ponds with the higher stream flows. In 2017, non-native fishes were absent during sampling at all sites upstream of Ogier Ponds and very scarce at the site below the ponds.

The 2017 flood, and the substantial draining and flushing of Metcalf Pond, probably reduced the predatory bass in the pond.

## MANAGEMENT IMPLICATIONS

**Adult Passage.**—Some adult steelhead accessed the spawning and rearing habitat in 2014 despite a only about a 2-3 day window of flow continuity through the passage corridor in February (Leicester and Smith 2014b). It is likely that access by most adults was severely constrained by the single small window of potential suitable stream flow. In 2015, the drought continued, as did severely reduced releases to Coyote Creek, despite improved runoff into Coyote and Anderson reservoirs compared to 2014 (Leicester and Smith 2015b). The continued reduced releases to Coyote Creek were insufficient to provide passage corridor connectivity. Increased releases from Anderson Reservoir during the February storm would have provided suitable adult passage through the dry gap in surface flow at and upstream of Bailey Avenue. The storm runoff from Fisher Creek, and urban runoff downstream of Metcalf Road, would have completed the connection to spawning and rearing habitat upstream of the Ogier Ponds. In 2016 potential passage was provided by large (up to 140 cfs) releases, but not until early April, which may have been too late. Spawning and rearing habitat upstream of Ogier Ponds was under-utilized in 2014, and unused in 2015, 2016 and 2017. Releases in years prior to February 2014 had maintained continuous stream flow downstream to below the Metcalf Pond, and adult access was probably regularly available during even small winter storms, due to Fisher Creek and suburban runoff. A February or early March pulse flow release strategy that would provide or improve adult steelhead access, even *or especially* in drier years, should be considered as a vital tool to restore and maintain a viable steelhead population.

The Singleton Road low flow crossing, with its perched culverts and concrete apron, makes passage past this location difficult except during periods of sustained moderate storm flows. Down-cutting of the channel downstream of the crossing has reduced the back-flooding of the apron and culverts, increasing the jump height into the culverts and the length of the inclined apron that must be negotiated. The high flows in 2017 demonstrated the severe velocity problems of high flows. The potential flow windows for passage are few. Removal of this crossing as soon as possible should be a priority, because it jeopardizes (and may have already crippled) the steelhead run. A plan is being developed by a consortium of local municipalities to modify the Singleton Road crossing for fish passage. It is hoped that this will continue to move forward expeditiously.

**Smolt Passage.**—Restored late winter and early spring stream flows would create suitable stream flow conditions for smolt emigration. The narrow window during and prior to the February storm in 2014 probably prevented most smolts reared in 2013 from emigrating, as it occurred prior to the peak smolt emigration period (Shapovalov and Taft 1954; Fukushima and Lesh 1998). However, if Coyote Creek regularly produces large smolts, that emigrate early, some smolts might have been able to use the small, early passage window. Smolts reared in 2014 had no chance to successfully emigrate in 2015 and were lost to the surface flow dry-back downstream of Ogier Ponds and/or to predation in Ogier Ponds. Since no YOY steelhead were apparently reared in 2015, 2016, and 2017, four consecutive years of steelhead production were eliminated, and smolt emigration substantially reduced in a fifth year, extirpating the

steelhead population in Coyote Creek or putting it at very significant risk of extirpation. Similar passage issues in Upper Penitencia Creek, the only tributary stream that has been recently documented to support steelhead, put the steelhead population in the entire watershed at great risk of extirpation (Leicester and Smith 2016). A strategy needs to be developed to provide for smolt emigration, even in some drought years, if a viable steelhead population is to be restored and maintained.

All of the steelhead juveniles produced in the rearing habitat upstream of Ogier Ponds must emigrate through the Ogier Pond complex, with its abundant predatory largemouth and spotted bass. Taking the ponds off-channel, by rerouting the stream around the ponds, is a necessary action to prevent predation loss of many of the smolts. Unlike Metcalf Pond, which can be periodically and temporarily drained (an unintended result of the 2017 flood) to remove predatory non-native fish, the task of significantly reducing the predators in the Ogier Ponds is not feasible without reducing or eliminating stream flow into the ponds for an extended period (which would require severe reductions in stream flows upstream). Routing Coyote Creek around the Ogier Pond complex and taking them off-channel would allow for management actions that would not be possible under current conditions. A seasonal (April through November) sport fishing season presently exists on Coyote Creek, and on other South Bay streams, despite the closure of all coastal steelhead streams to fishing during this period. A proposal should be made to the California Department of Fish and Wildlife Commission to close the stream to fishing during this period to better protect steelhead. The seasonal fishery, with allowable take of “hatchery” trout and steelhead, presents an enforcement problem and a threat to maintaining the precarious steelhead populations. However, the open season also allows fishing for bass and other species in the Ogier Ponds and at Metcalf Pond, as well as in the stream. If the Ogier Ponds are taken off line to eliminate the temperature and predatory threats to steelhead, fishing could continue in the off-channel Ogier Ponds, even if the fishing regulations are changed to exclude fishing in the creek.

**Stream Flow.**—The sites sampled in 2014 and 2015 were atypical of the general habitat conditions in Coyote Creek, in that they were specifically chosen to include riffles and shallow run habitats that provide fast-water feeding habitat preferred by drift-feeding juvenile steelhead downstream from reservoirs in Santa Clara County (Casagrande 2010; Smith 2011; Leicester and Smith 2014a and 2015b). All of the *O. mykiss* caught in 2014 were from fast-water habitats (Leicester and Smith 2014b). The majority of Coyote Creek between Anderson Reservoir and Metcalf Pond is low gradient, and dominated by pools. Riffles and runs with coarse substrate are relatively scarce. Higher stream flows are necessary to increase width, depth, and velocity of riffles and runs and to increase the amount of fast-water “head of pool” habitat in pools located downstream of these coarse-bottomed riffle and run areas (Casagrande 2010) where aquatic invertebrates are abundant (Casagrande 2010; Foster 2014). However, those fast habitats would still be relatively scarce in the context of the entire system, and slow to moderate velocity pool habitat would still be the predominant habitat feature, even at high stream flows like those in 2016 and summer 2017. The operational flows observed in 2014 and 2015 were atypical due to the drought. Under operations prior to 2014 and in 2016 and 2017, with higher augmented flow rates, the amount and quality of juvenile steelhead rearing habitat

increases substantially. Even where coarse substrates are absent or scarce, fast-water areas can make substantial numbers of terrestrial invertebrates available to drift-feeding steelhead (Foster 2014).

In years prior to 2014, dry season stream flows in Coyote Creek downstream of Anderson Reservoir were typically between 30 and 50 cfs. Most of this flow percolated between the reservoir and Blossom Hill Boulevard and recharged the underground aquifer, which the Santa Clara Valley heavily depends upon for its water supply. These flows would have also provided suitable fast-water rearing habitat for juvenile steelhead. Habitat appears to have been better in 2016 and 2017 in the areas that supported summer flow in 2014 and 2015, and potentially suitable physical (but warm) habitat existed downstream in 2016 and 2017 in areas that were dry in both years. Higher stream flows also reduced the relatively abundant juvenile spotted and largemouth bass that were common at the three sites sampled in 2014 and 2015, although bass and carp from the Ogier Ponds were present downstream of the ponds in 2016.

**Water Temperature.**—Quality of potential rearing habitat depends heavily on the food available and upon the water temperature of stream flows, as higher water temperature increases the metabolic rate of fish and increases their food demands for survival and growth (Myrick and Cech 2005). When food is readily available, the best growth rates occur at warmer temperatures (e.g., 19°C), because assimilation rate also increases at higher temperatures (Myrick and Cech 2005). However, at lower food availability the increased metabolic cost of higher temperature reduces growth (Weber et al. 2014). For drift-feeding steelhead, higher water temperatures cause fish to use faster microhabitats, where food is more abundant (Smith and Li 1983); therefore, stream flow and water temperature are not independent in determining steelhead abundance, growth and habitat selection.

For Coyote Creek the two main factors potentially affecting stream temperature are the temperatures of reservoir and pipeline releases to the stream and the warming effect of the Ogier Pond complex on water temperature downstream of the ponds. With most reservoirs operated by SCVWD, water is released from the bottom, which is normally cool in summer, at least until the reservoir is drawn down (Casagrande 2010 and 2014; Leicester and Smith 2014a). However, Anderson Reservoir on Coyote Creek has a multiport release system; water can be released from the bottom where it remains cool year-round, or it can be released from higher in the reservoir water column where temperatures are much warmer, especially in late summer. The San Felipe Pipeline also brings in Bureau of Reclamation water from San Luis Reservoir for potential distribution to Anderson Reservoir by pumping up into the reservoir, when no reservoir withdrawals are being made, for direct release to Coyote Creek, or for distribution to other locations in northern Santa Clara County. In 2014-2016, releases to Coyote Creek were usually more from the pipeline than the reservoir and were quite warm for most of the late summer and fall. The moderate size of the YOY steelhead captured in 2014, their lack of significant growth between late September and late November, and the indications of slower growth and growth interruptions on their scales in late summer indicated that the water temperatures were too high for the food available for late summer growth (Leicester and Smith 2014b). Conversely, the large size of the single yearling steelhead captured in in early summer

of 2015 indicates that growth in late fall through spring is good, and may be attributable to warmer and clearer water than is typically present in most local streams during that period. In 2017, a larger share of the stream flow was provided by reservoir releases, because of the seismic need to lower the reservoir storage level. Water temperatures were slightly lower, but increased later in summer as the reservoir was drawn down, sending warmer water through the mid-level release port.

If substantially cooler water was released for all or part of the summer, steelhead growth and survival would likely be much better, at least in the reach between the dam and the Ogier Ponds. However, this would potentially require sending more warm imported water to the treatment plants, blended with cool bottom reservoir water (rather than from the mid-elevation release port), which could impact treatment costs or drinking water quality. Operations might have to depend upon monitoring the temperature of pipeline and reservoir releases. In non-drought years, providing cooler (and greater) releases should be pursued to improve conditions for threatened steelhead.

The Ogier Pond complex causes substantial increases in water temperatures downstream, because warmed surface water is progressively shuttled through the four ponds. The outflow temperature from the ponds in summer is likely to average 22-25°C, regardless of inflow temperature because of the high heat capacity of the ponds and the outflow of warm surface water. Such temperatures will have severe effects on steelhead growth and survival downstream of the ponds, regardless of the release temperatures at the reservoir. Elevated water temperatures in the ponds also create another indirect effect by increasing the food requirements of the predatory bass. This would be especially problematic during the late spring smolt emigration period. Predation impacts caused by the ponds and their substantial heating effect on water temperatures constitute very strong justification to reroute the stream around the ponds as soon as possible.

***Spawning Gravels and Other Channel Enhancements.***—Future investigations should evaluate the need for gravel augmentation to improve spawning success, especially since there are probably relatively few returning adult steelhead. Fast-water feeding habitats are important for steelhead abundance and growth in low gradient streams (Casagrande 2010). The step-run and riffle habitat created by boulders immediately downstream of Anderson Reservoir (the upper sample site) may provide a viable example of channel enhancement for juvenile steelhead feeding (Leicester and Smith 2015b).

***Fish Sampling.***—NOAA guidelines since 2015 for electrofishing limit sampling to water temperatures of 18°C or less. Unless water temperatures are reduced from those encountered in 2014-2017, sampling for juvenile steelhead would be extremely restricted both as to timing and location. In 2015-2017, fall sampling was not possible until October or November, and early morning sampling in late June and early July was conducted to meet the requirements in 2015. In 2017, morning sampling in August was conducted just prior to the sampling temperature cut-off at the two sites closest to the reservoir; sampling the two warmer sites farther downstream was delayed until late October. Future sampling at the warmer sites

downstream of Ogier Ponds could probably not be sampled to determine their utilization by steelhead until late October or later. November sampling can only be conducted if it is prior to rains which might allow adult access. Sampling prior to June is not allowed because adults and smolts might still be present, and although sampling in June would occur after smolts had left, YOY would then be too small to be efficiently captured. In addition, sampling at most sites prior to June would still be prevented by high water temperatures produced by the Ogier Pond complex. This conflict for necessary population monitoring will persist as long as the 18°C cap is in place.

The more typical high summer/fall stream flows present in 2016, 2017, and prior to 2014 are desirable for rearing steelhead, but in 2016 and 2017 the high flows made electrofishing more difficult. Coordinated, brief (1-2 day) reductions in flows, if they could be conducted without resulting in stream dry-back, might improve electrofishing effectiveness.

#### **ACKNOWLEDGMENTS**

Permission to sample in the Coyote Creek County Park was provided by Santa Clara County Department of Parks and Recreation and the SCVWD. Jim Butera assisted with the electrofishing. Jae Abel (SCVWD) assisted with water temperature data management.

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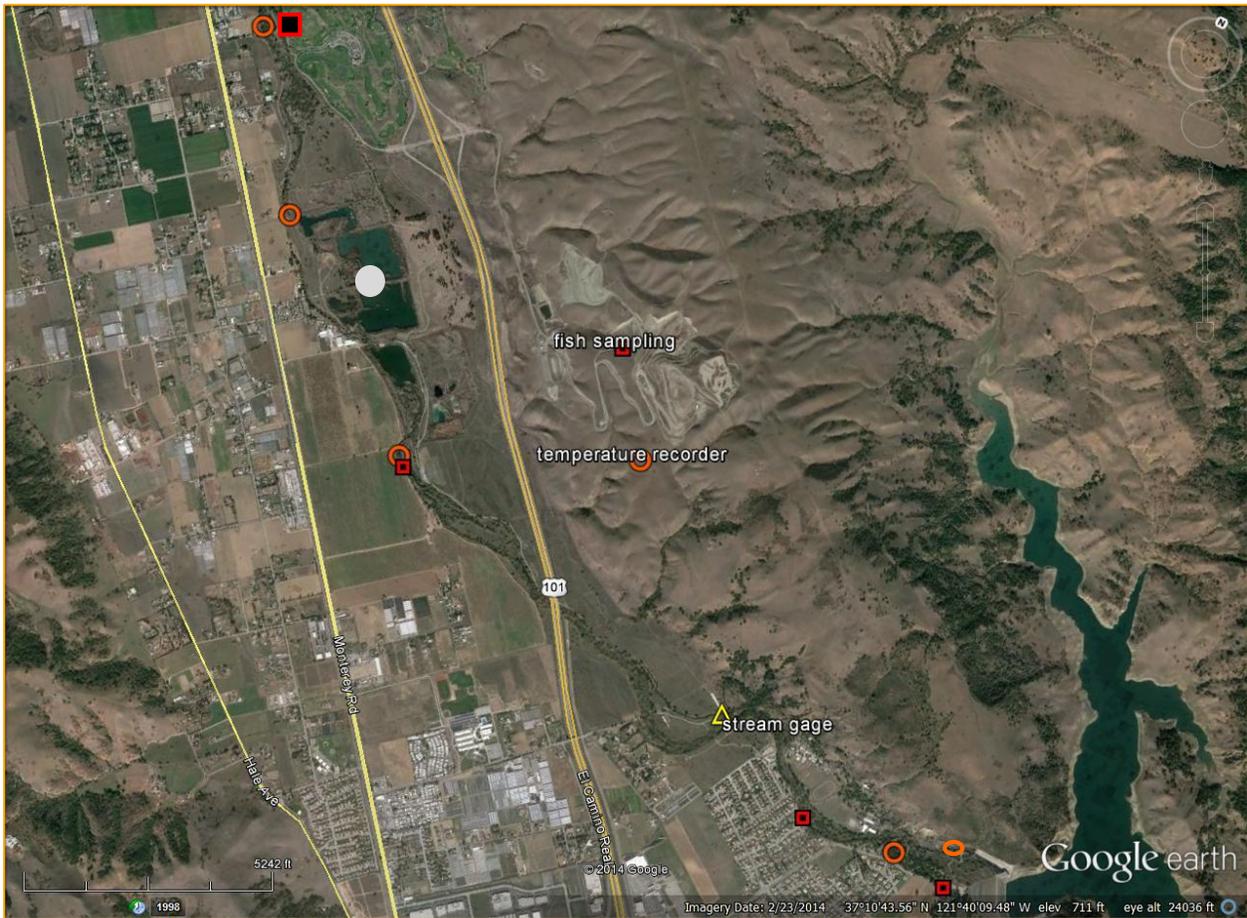


Figure 1. Coyote Creek downstream of Anderson Reservoir, showing locations of temperature recorders (orange circles) and fish sampling reaches (red squares) in 2017. An additional temperature recorder was just upstream of Metcalf Pond, farther north.

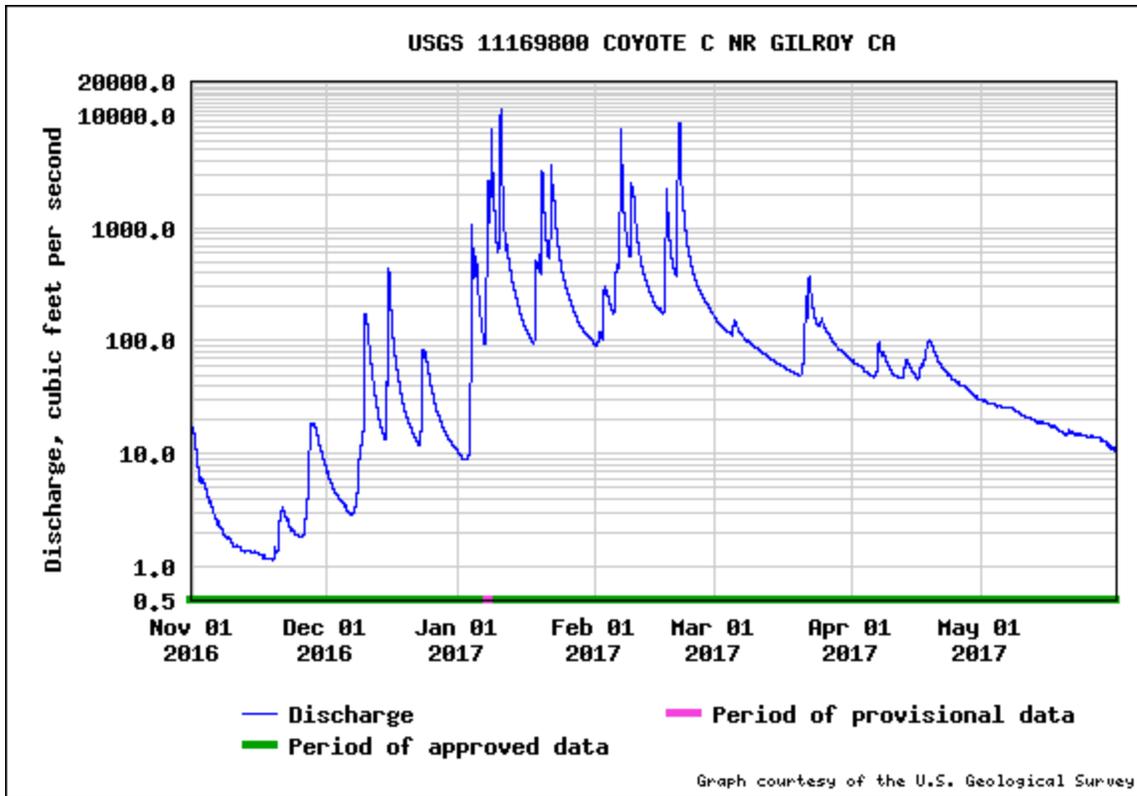


Figure 2. Stream flow on Coyote Creek at the USGS gage upstream of Coyote Reservoir From 1 November 2016 through May 2017.

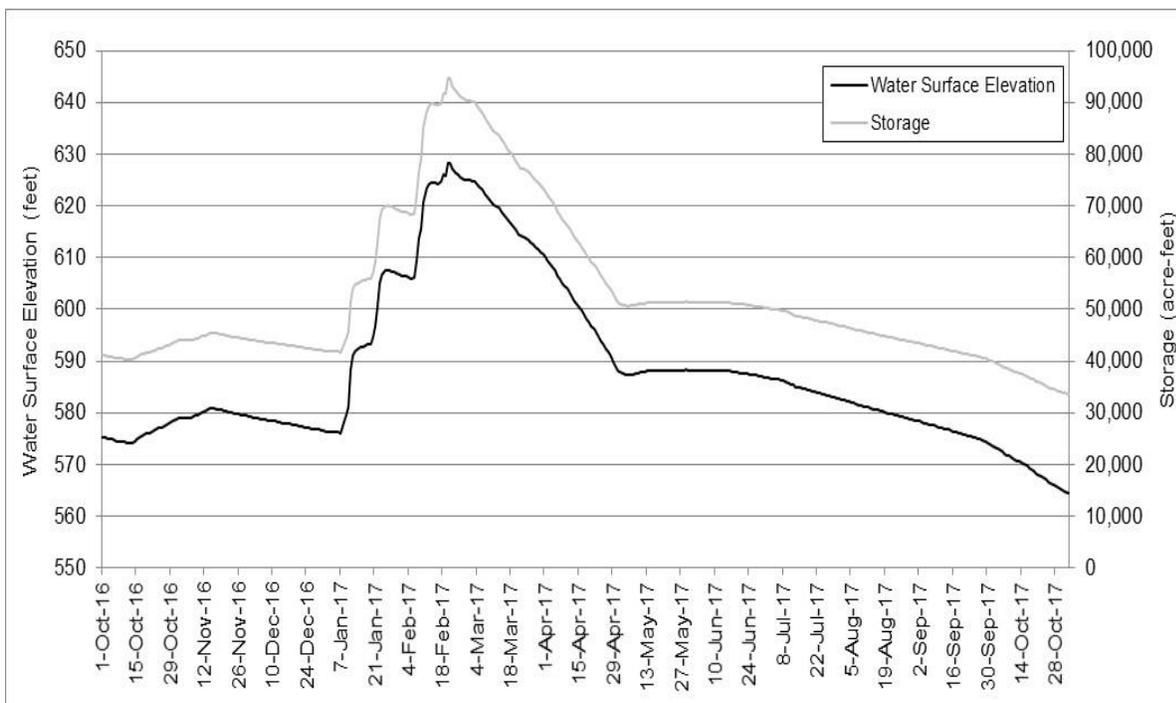


Figure 3. Anderson Reservoir water surface elevation and storage from 1 Oct 2016 through 1 Nov 2017.

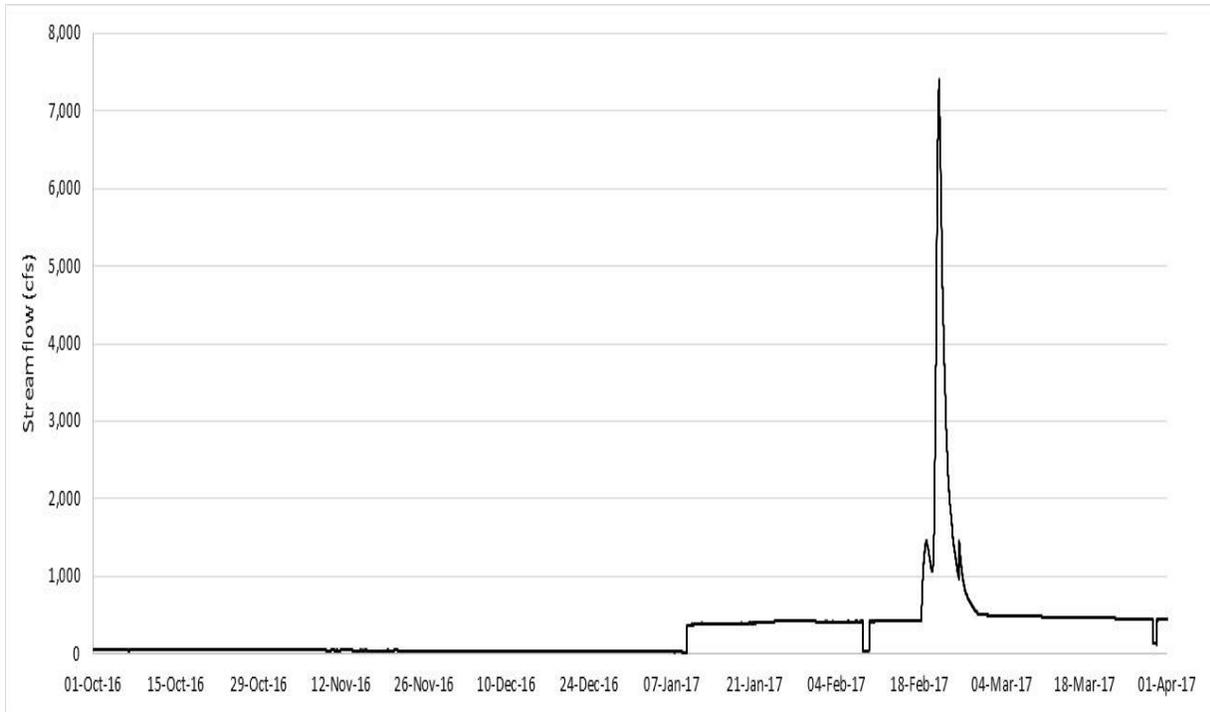


Figure 4. Mean daily stream flow at the SCVWD Madrone Gage (1.5 miles downstream of Anderson Reservoir) from 1 October 2016 through 1 April 2017. The brief drop in Reservoir release in February was to lower or remove Metcalf Pond dam panels, and the Drop on 30 March was to modify the fish ladder for passage at the lower pond level.

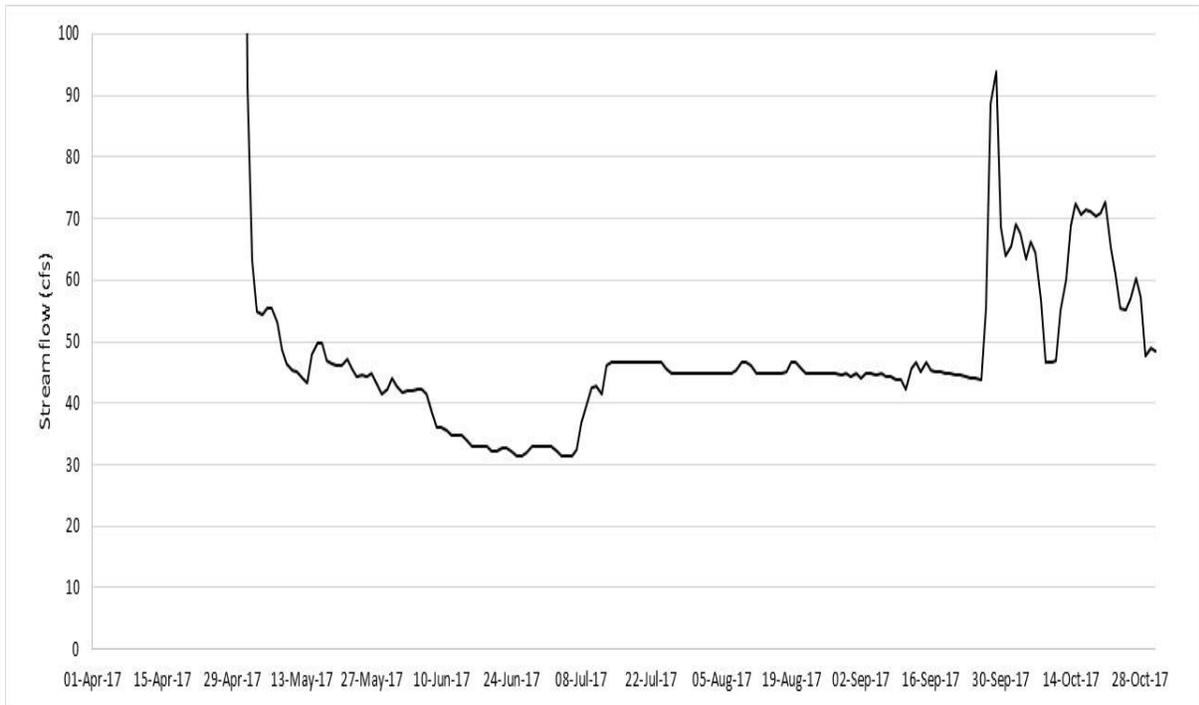


Figure 5. Mean daily stream flow at the SCVWD Madrone Gage (1.5 miles downstream of Anderson Reservoir) from 1 April through 1 November 2017.



Figure 6. Mean daily stream flow at the SCVWD Edendale gage (in the urban area downstream of Metcalf Percolation Pond) from 1 October 2016 through 1 April 2017.

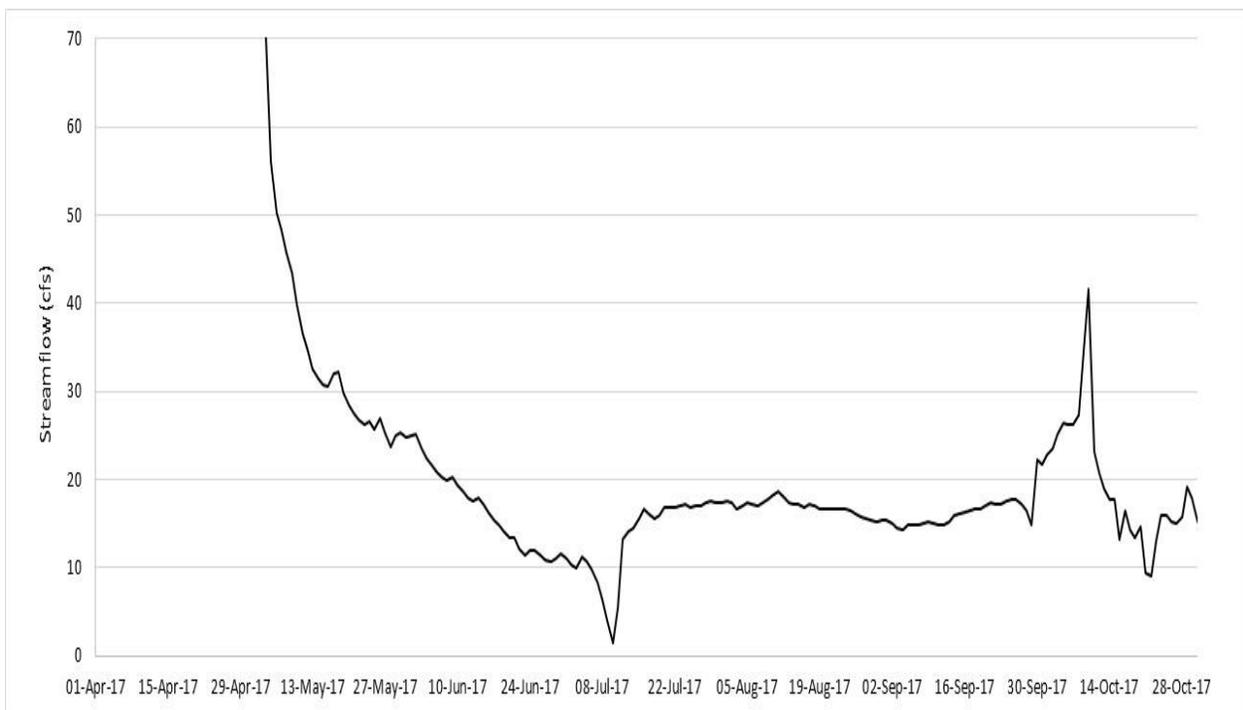


Figure 7. Mean daily stream flow at the SCVWD Edendale gage (in the urban area downstream of Metcalf Percolation Pond) from 1 April through 1 November 2017.

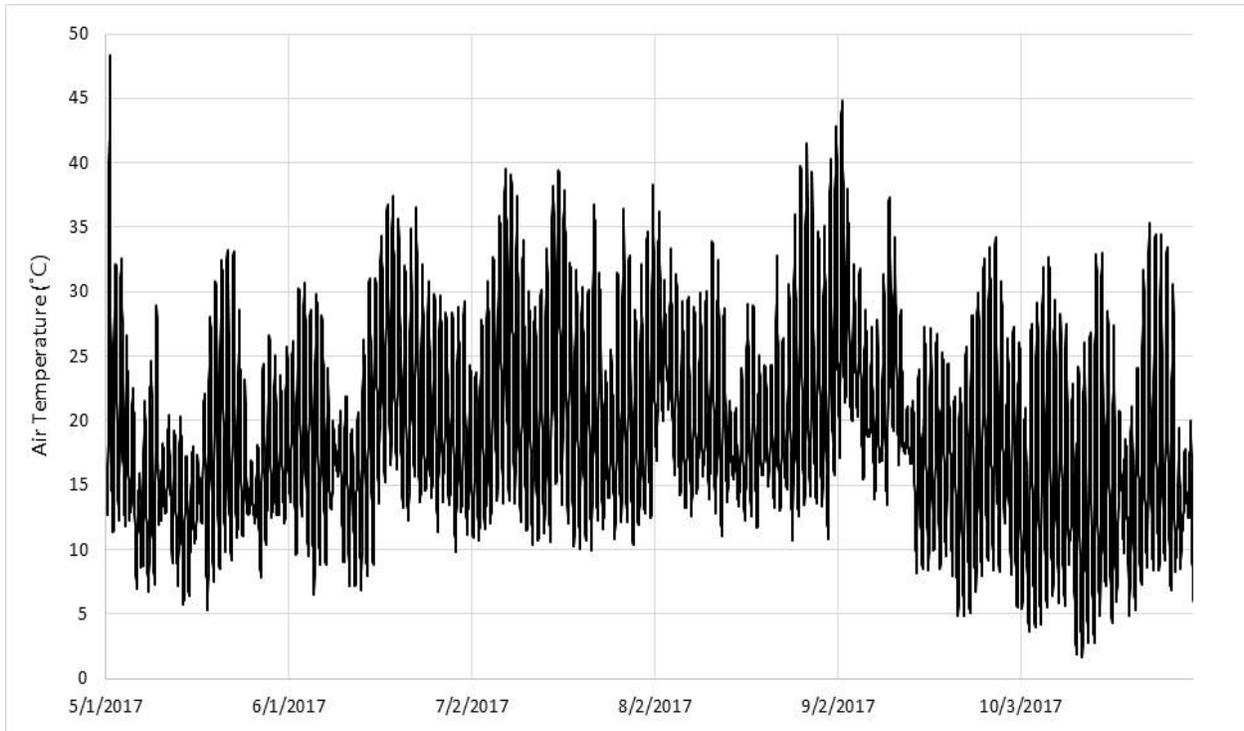


Figure 6. Air temperatures near Highway 152 west of Gilroy from 1 May through 1 November 2017.

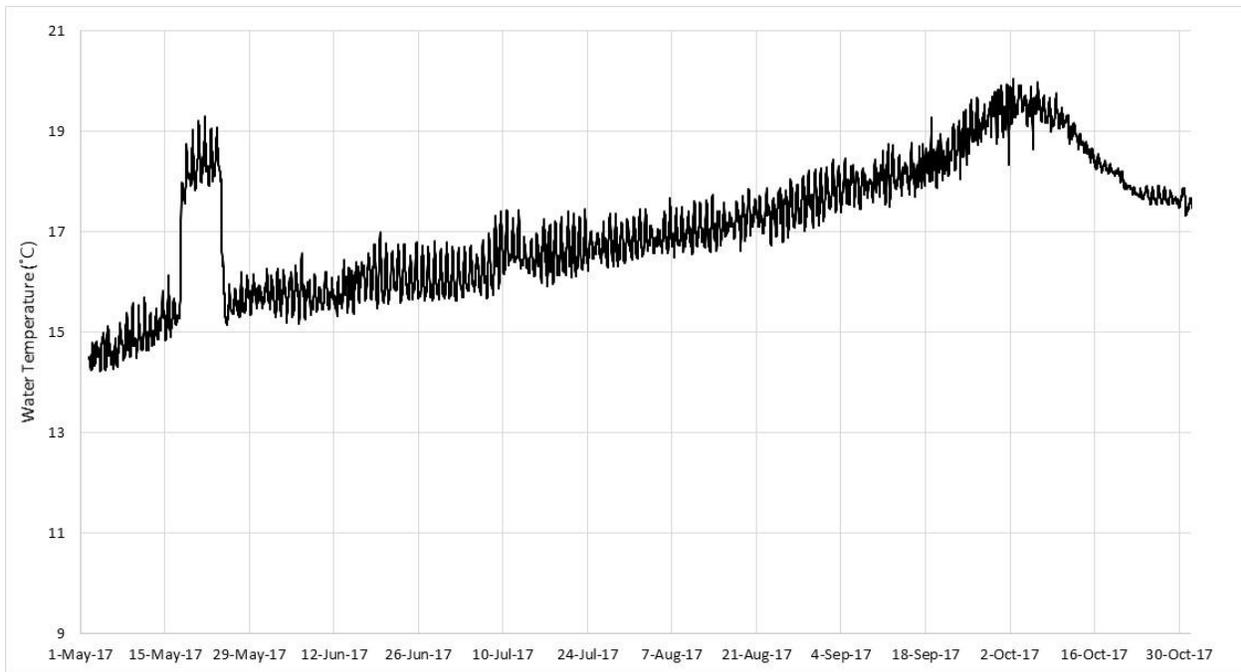


Figure 7. Water temperatures in Coyote Creek in the park downstream of the pipeline and reservoir discharges from 1 May through 1 November 2017.

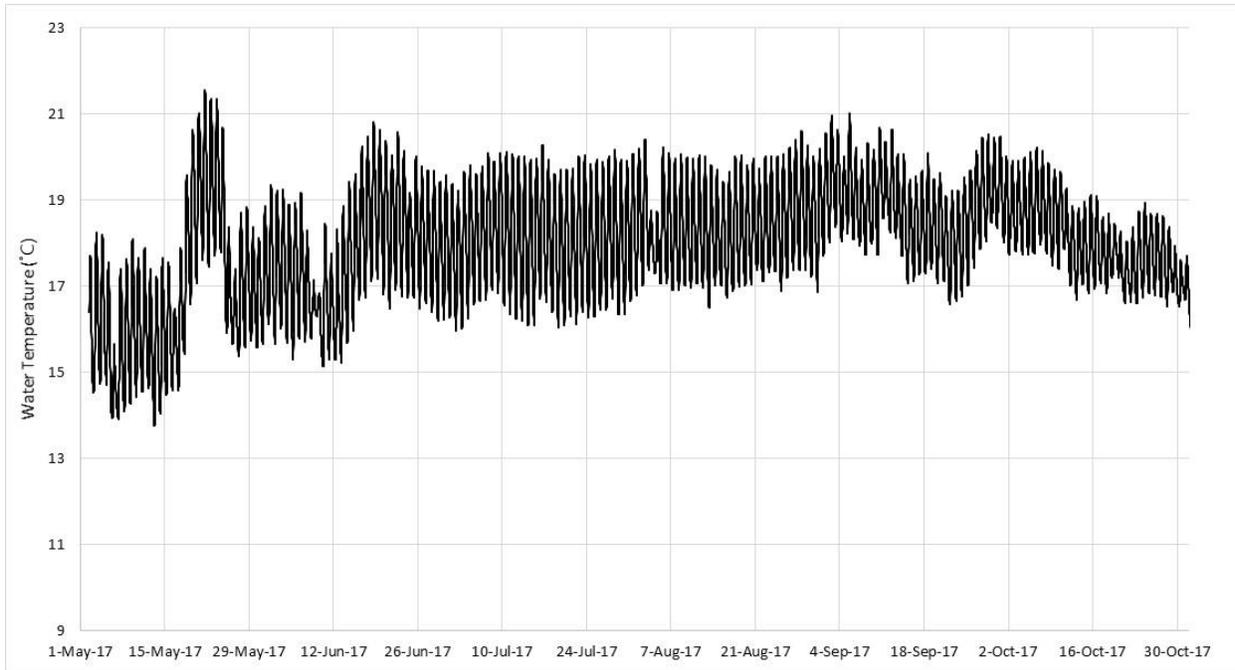


Figure 8. Water temperatures in Coyote Creek upstream of the Ogier Ponds Complex from 1 May through 1 November 2017.

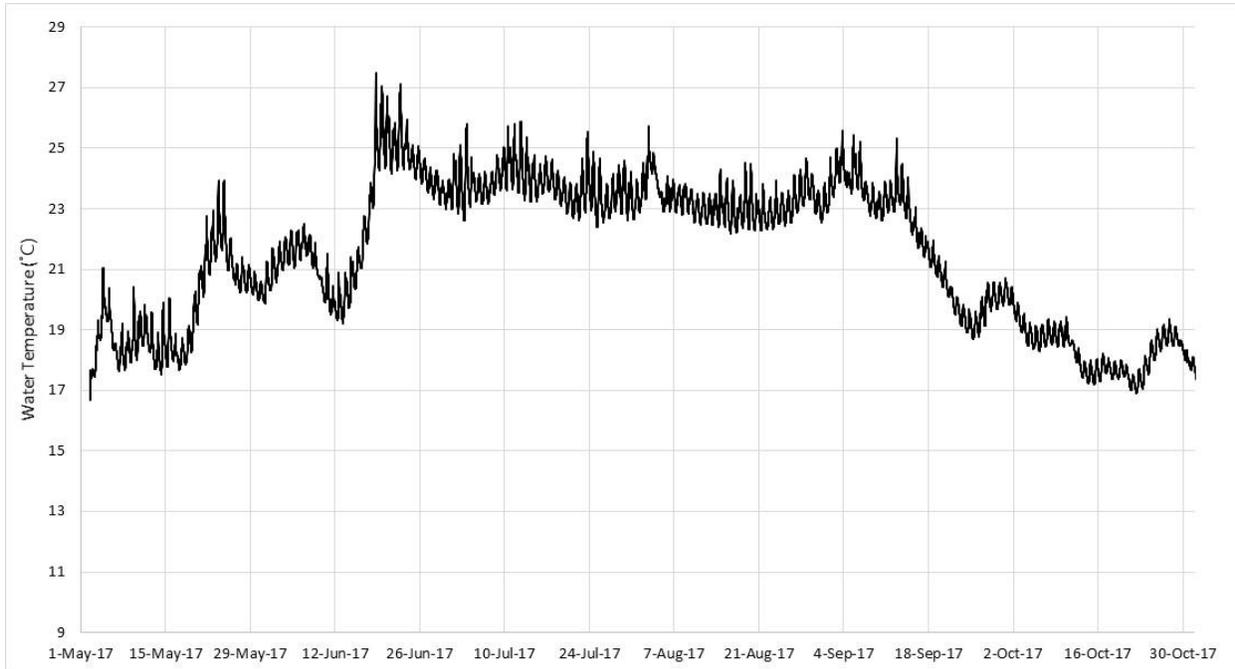


Figure 10. Water temperatures in Coyote Creek immediately downstream of the Ogier Pond complex (downstream of Ogier Pond #4) on Coyote Creek from 1 May through 1 November 2017.

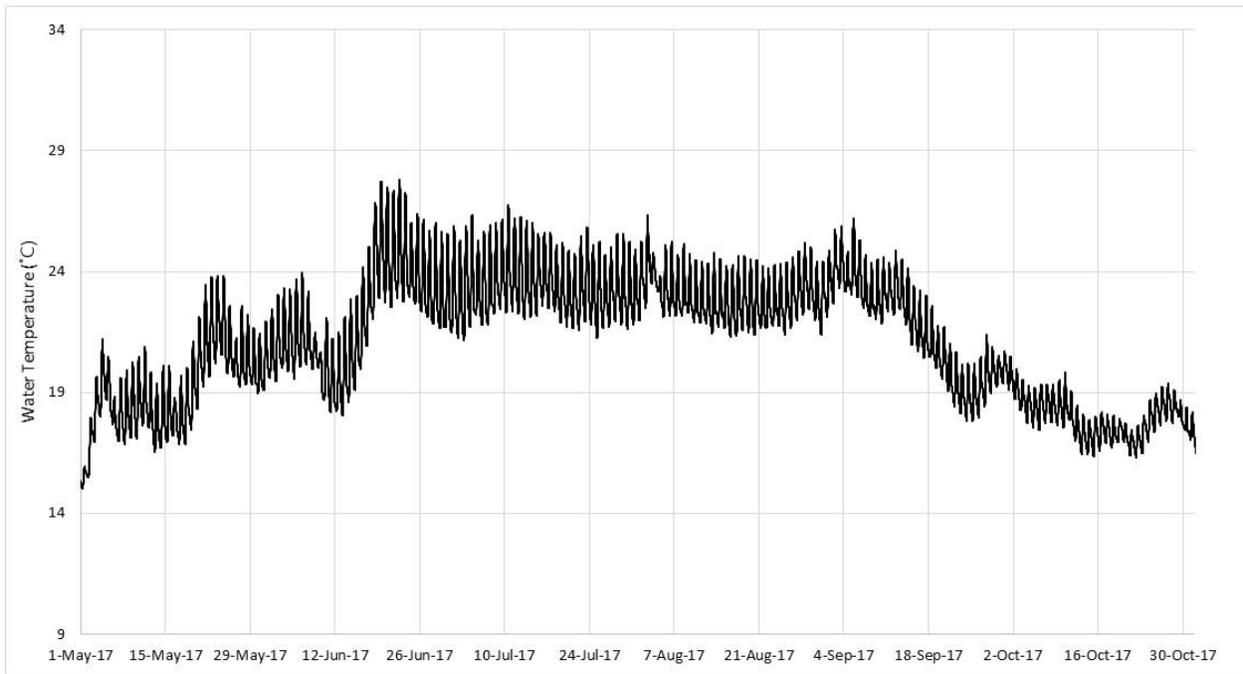


Figure 11. Water temperatures in Coyote Creek immediately downstream the Golf Course Road from 1 May through 1 November 2017.

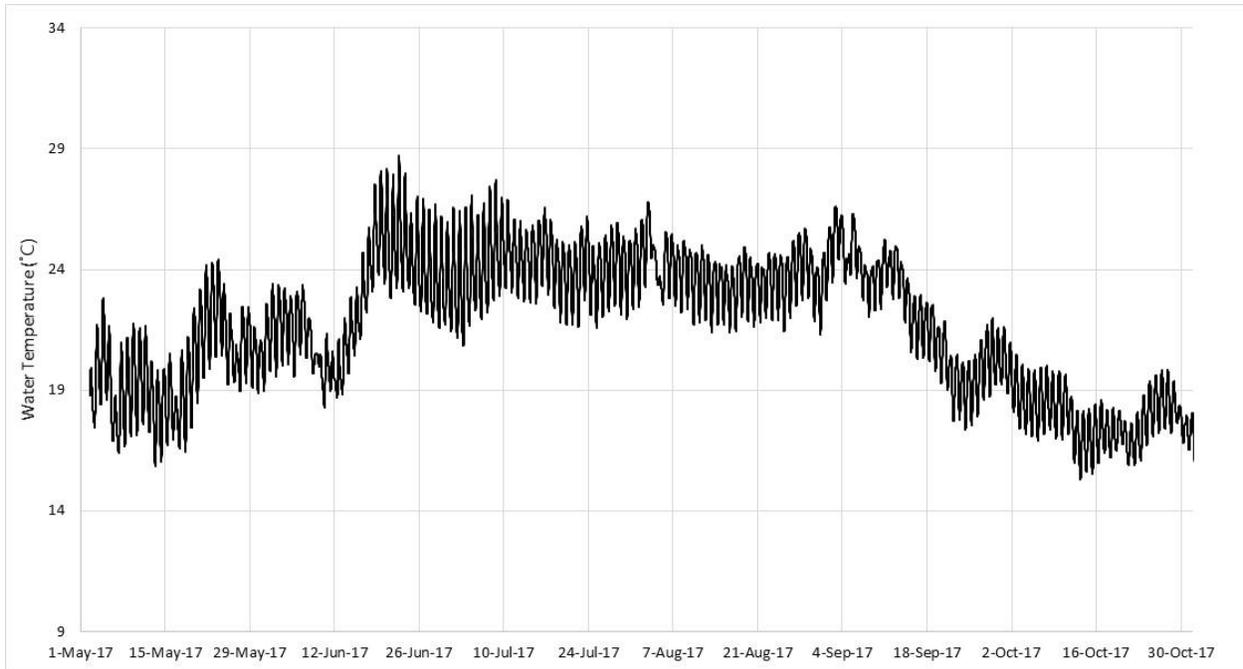


Figure 12. Water temperatures in Coyote Creek immediately downstream of Coyote Ranch Road (upstream of Metcalf Pond) from 1 May through 1 November 2017.

Figure 13. Standard lengths (mm) of *O. mykiss* captured by electrofisher at three sites on Coyote Creek on 29 September/24 November 2014; and 28 June 2015. No *O. mykiss* were captured in 2016 or 2017.

Standard Length (mm)	Upstream of Ogier Ponds 2014		US Boys Ranch DS of Anderson Res. 2014	Immediately DS Anderson Reservoir 2014	
	9/29 (n=9)	11/24 (n=3)	11/24 (n=30)	9/29 (n=12)	11/24 (n=7)
80 – 84			XXX		
85 – 89	XXX		XXXXXXXXXXXX		
90 – 94	XX		XXXXX	X	
95 – 99	X		XXXXX	XX	XXX
100-104	X	XX	XXXX	XXX	X
105-109	X	X	X	XXX	X
110-114				XXX	X
115-119	X				
120-124			X		X
225 -229			US Boys Ranch DS of Anderson Res. 28 June 2015 X		



**Table 1. Amount of habitat sampled, number of *O. mykiss* captured, and estimated density from depletion at sites on Coyote Creek in September and November 2014 and 28 June, 3 July and 14 November 2015, 21 October 2016 , and 28 August and 26 October 2017 (2017 data in bold).**

Site and Date	Distance Sampled (feet)	<i>O. mykiss</i> Captured	Estimated Density (number per 100 feet)
Downstream of Reservoir			
29 September 2014	175	12	7.1 / 100 feet
24 November 2014	175	7	4.1
3 July 2015	175	0	0
21 October 2016	175	0	0
<b>28 August 2017</b>	<b>185</b>	<b>0</b>	<b>0</b>
Upstream of Correctional Facility			
24 November 2014	422	30 (+ 1 yearling missed)	8.2
28 June 2015	425	1 (+ 1 missed)	0.4 (yearlings)
14 November 2015	425	0	0
21 October 2016	365	0	0
<b>28 August 2017</b>	<b>425</b>	<b>0</b>	<b>0</b>
Upstream of Ogier Ponds near Model Airplane Park			
29 September 2014	524	10	1.9
24 November 2014	275	3	1.1
28 June 2015	475	0	0
21 October 2016	285	0	0
<b>26 October 2017</b>	<b>710</b>	<b>0</b>	<b>0</b>

Table 1 (continued)

Site and Date	Distance Sampled (feet)	<i>O. mykiss</i> Captured	Estimated Density (number per 100 feet)
Downstream of Golf Course Road			
21 October 2016	95	0	0
<b>26 October 2017</b>	<b>120</b>	<b>0</b>	<b>0</b>

**Appendix: Photos**



Photo 1. Metcalfe Pond dam on 18 February 2017 at 1300 cfs. Radial gates were open and the fish ladder was not passable.



Photo 2. Metcalfe Pond dam on 21 February 2017 at 6500+ cfs. Very turbid water from storm flows that filled and spilled from Anderson Reservoir.



Photo 3. Metcalf Pond ladder and radial gates on 21 February 2017 at 6500+ cfs. The pond water level was high enough that even with the dam panels down there was potential passage in the fish ladder.



Photo 4. Metcalf Pond dam on 26 February 2017 at approximately 700 cfs, with impassable apron and lowered dam panels.



Photo 5. Metcalf Pond radial gates and impassable (no flow) fish ladder on 26 February 2017.



Photo 6. Metcalf Pond Dam on 15 April 2017, with a functioning fish ladder that had been modified for passage by 30 March.



Photo 7. Metcalfe Pond dam panels reinstalled and dam apron buttressed with grouted boulders on 3 October 2017. Flow bypassed in pipeline to allow grouted boulder weir construction that was necessitated by channel down-cutting during flood.



Photo 8. Boulder weir fishway construction leading to fish ladder on 3 October 2017.



Photo 9. Grouted boulder weirs on 15 October 2017, with pipeline removed and flow through radial gates. Gates were slowly closed (to maintain a live stream downstream) raising the Metcalf Pond water level, and allowing flow to spill through the fish ladder 1 week later.



Photo 10. Singleton Road on 26 February 2017 at 650++ cfs, with no adult steelhead passage possible because of high velocity in the two submerged culverts and on the steeply inclined apron.



Photo 11. Singleton Road at approximately 450 cfs on 15 April 2017, impassable due to high velocity in the culverts and on the inclined apron.

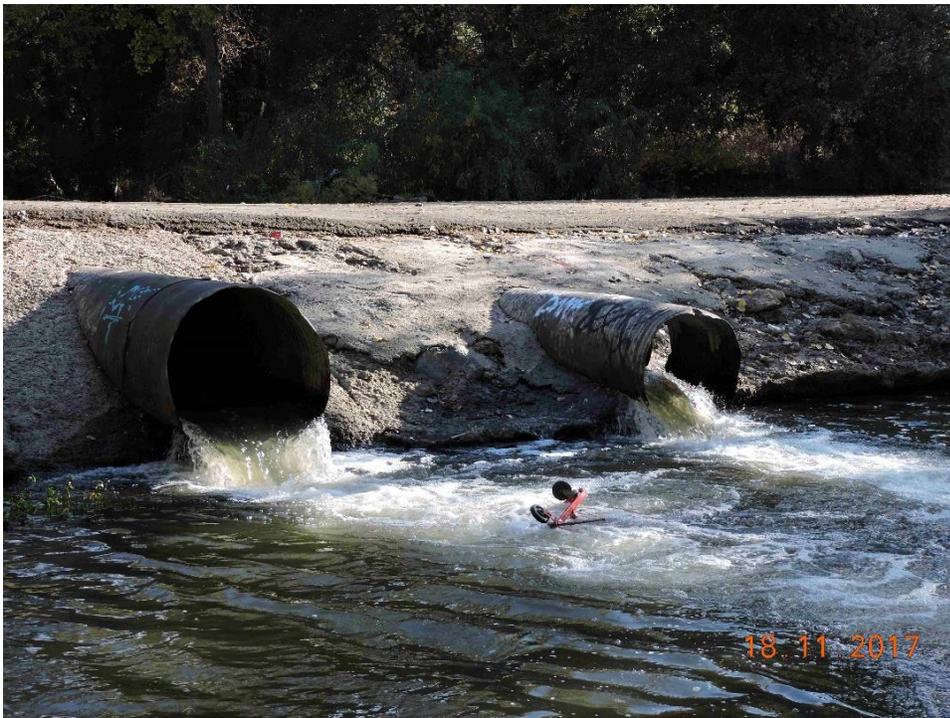


Photo 12. Singleton Road on 18 November 2017 at approximately 50 cfs. Possibly marginally passable through the culverts. Note the damage to culvert on the right in the picture.





Photo 13. Immediately downstream of the outflow from Anderson Reservoir on 2 May 2017. Due to the seismic need to lower the water level in the reservoir and to recharge the aquifer, stream flows were high in Coyote Creek all summer and fall, and most of the water came from the reservoir rather than from a more equal combination of imported San Felipe Pipeline water and reservoir releases. This resulted in cooler stream water temperatures upstream of Ogier Ponds than in 2014-2016. Releases were usually turbid (visibility 15 cm on 2 May and 50 cm on 18 November) because of the abundant stored storm runoff.



Photo 14. Realigned channel between the Model Airplane Park and Ogier Pond #1 at 70 cfs on 26 October 2017. The channel was moved during the February flood 300 feet to the east to an old stream channel. Less than 1 cfs was flowing in the bypassed old channel.



Photo 15. The stream rejoined and braided 4+ channels through the forested old channel location upstream of Ogier Pond #1. 26 October 2017.



Photo 16. Washed out road and culvert immediately downstream of Ogier Pond #1 on 2 May 2017 at approximately 150 cfs. Stream flow was still turbid (16 cm visibility) from storm water stored in Anderson Reservoir. Visibility had cleared to 75 cm by 26 October 2017.



Photo 17. Outlet to Ogier Pond #4 on 18 November 2017 at approximately 70 cfs. The narrow outlet was widened from about 25 feet to 85 feet (including 45 feet above the present water surface).



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**File No.:** 18-0523

**Agenda Date:** 7/16/2018

**Item No.:** 4.2.

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## COMMITTEE AGENDA MEMORANDUM

### Environmental and Water Resources Committee

**SUBJECT:**

Update from Environmental and Water Resources Committee's Working Groups.

**RECOMMENDATION:**

Provide comments to the Board on implementation of District mission applicable to working groups' recommendations.

**SUMMARY:**

At the Committee's January 2017 meeting, the Committee would like to see the working groups more aligned with the issues and policies that the Board of Directors has on their work plan and calendar for this year.

The Board approved the Committee's request to keep the Committee informed of the working groups' activities and results.

This will be a standing agenda item.

**BACKGROUND:**

The District Act provides for the creation of advisory boards, committees, or commissions by resolution to serve at the pleasure of the Board.

Accordingly, the Board has established Board Committees, which bring respective expertise and community interest, to advise the Board, when requested, in a capacity as defined: prepare Board policy alternatives and provide comment on activities in the implementation of the District's mission for Board consideration. In keeping with the Board's broader focus, Board Committees will not direct the implementation of District programs and projects, other than to receive information and provide comment.

Further, in accordance with Governance Process Policy-3, when requested by the Board, the Board's Committees may help the Board produce the link between the District and the public through information sharing to the communities they represent.

**ATTACHMENTS:**

Attachment 1: Working Groups Spreadsheet

**UNCLASSIFIED MANAGER:**

Michele King, 408-630-2711

## 2018 EWRC Independent Working Groups

Name	1. District's Communications Programs/Civic Engagement (Review Transparency Report)	2. Winter Preparedness	3. Climate Change Mitigation	4. Climate Change and Sea Level Rise Adaptation	5. Riparian Corridor Ordinance, Encroachment Process	6. Endangered Species (Drought/Environmental Impacts)	7. Joint Use of Trails	8. Open Space Credit	Total Groups Joined
<b>New Groups to Align with Board's Calendars/Work Plans</b>									
Bonnie Bamberg									0
John Bourgeois				1		1			2
Tess Byler	1			1					2
Hon. Dean Chu			1				1		2
Maya Esparza	1						1		2
Stephen A. Jordan									0
Arthur M. Keller, Ph.D.			1	1					2
Hon. Patrick S. Kwok									0
Loren B. Lewis									0
Bob Levy									0
Tara Martin-Milius	1		1	1					3
Sachihiko Michitaka					1				1
Rev, Jethroe Moore II				1			1		2
Rita Norton	1		1		1				3
Marc Rauser									0
Elizabeth Sarmiento			1			1			2
Charles Taylor									0
Richard Zahner									0
<b>Total Members</b>	4	0	5	5	2	2	3	0	21

Lead

Member did not sign up for any group (s)

**No District Staff hours are provided to support the working groups**

**Members should limit the number of working groups they participate in because of possible Brown Act Violations (2-3 groups only)**

**Please Note: You will be sharing your phone number and email address with the other members when signing up.**

**When planning meetings, the Group Chair (Lead) should contact Glenna via email with meeting date/time and location and how many members are expected to attend.**

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**File No.:** 18-0524

**Agenda Date:** 7/16/2018

**Item No.:** 4.3.

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## COMMITTEE AGENDA MEMORANDUM

### Environmental and Water Resources Committee

**SUBJECT:**

Review Environmental and Water Resources Committee Work Plan, the Outcomes of Board Action of Committee Requests; and the Committee's Next Meeting Agenda.

**RECOMMENDATION:**

Review the Committee work plan to guide the Committee's discussions regarding policy alternatives and implications for Board deliberation.

**SUMMARY:**

The attached Work Plan outlines the Board-approved topics for discussion to be able to prepare policy alternatives and implications for Board deliberation. The work plan is agendaized at each meeting as accomplishments are updated and to review additional work plan assignments by the Board.

**BACKGROUND:**

**Governance Process Policy-8:**

The District Act provides for the creation of advisory boards, committees, or committees by resolution to serve at the pleasure of the Board.

Accordingly, the Board has established Advisory Committees, which bring respective expertise and community interest, to advise the Board, when requested, in a capacity as defined: prepare Board policy alternatives and provide comment on activities in the implementation of the District's mission for Board consideration. In keeping with the Board's broader focus, Advisory Committees will not direct the implementation of District programs and projects, other than to receive information and provide comment.

Further, in accordance with Governance Process Policy-3, when requested by the Board, the Advisory Committees may help the Board produce the link between the District and the public through information sharing to the communities they represent.

**ATTACHMENTS:**

Attachment 1: Environmental and Water Resources Committee 2018 Work Plan

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**File No.:** 18-0524

**Agenda Date:** 7/16/2018  
**Item No.:** 4.3.

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Attachment 2: Environmental and Water Resources Committee October 15, 2018 Draft  
Agenda

**UNCLASSIFIED MANAGER:**  
Michele King, 408-630-2711

## 2018 Work Plan: Environmental and Water Resources Committee

Update: July 2018

GP8. Accordingly, the Board has established Advisory Committees, which bring respective expertise and community interest, to advise the Board, when requested, in a capacity as defined: prepare Board policy alternatives and provide comment on activities in the implementation of the District's mission for Board consideration. In keeping with the Board's broader focus, Advisory Committees will not direct the implementation of District programs and projects, other than to receive information and provide comment.

The annual work plan establishes a framework for committee discussion and action during the annual meeting schedule. The committee work plan is a dynamic document, subject to change as external and internal issues impacting the District occur and are recommended for committee discussion. Subsequently, an annual committee accomplishments report is developed based on the work plan and presented to the District Board of Directors.

ITEM	WORK PLAN ITEM	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
1	Election of Chair and Vice Chair for 2018	January 22	<ul style="list-style-type: none"> <li>Committee Elects Chair and Vice Chair for 2018. <b>(Action)</b></li> </ul>	<b>Accomplished January 22, 2018:</b> The Committee elected Mr. Loren Lewis as the Chair for 2018 and Arthur M. Keller, Ph.D. as the Vice Chair for 2018.
2	Annual Accomplishments Report	January 22	<ul style="list-style-type: none"> <li>Review and approve 2017 Accomplishments Report for presentation to the Board. <b>(Action)</b></li> <li>Provide comments to the Board, as necessary.</li> </ul>	<b>Accomplished January 22, 2018:</b> The Committee reviewed and approved the 2017 Accomplishments Report for presentation to the Board
3	Civic Engagement	January 22	<ul style="list-style-type: none"> <li>Receive feedback from Committee per Transparency Audit. <b>(Action)</b></li> <li>Provide comments to the Board, as necessary.</li> </ul>	<b>Accomplished January 22, 2018:</b> The Committee received information on Civic Engagement and took no action.
4	Winter Preparedness Update	January 22	<ul style="list-style-type: none"> <li>Receive information on the District's Winter Preparedness. <b>(Information)</b></li> </ul>	<b>Accomplished January 22, 2018:</b> The Committee received information on Winter Preparedness and took no action.

Yellow = Update Since Last Meeting

Blue = Action taken by the Board of Directors

Attachment 1

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ITEM	WORK PLAN ITEM	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
5	Receive information on shallow aquifers, dewatering, recharge, well pumping (when to use or not).	January 22	<ul style="list-style-type: none"> <li>Receive information on shallow aquifers, dewatering, recharge, well pumping (when to use or not). <b>(Information)</b></li> </ul>	<p><b>Accomplished January 22, 2018:</b> The Committee received information on shallow aquifers, dewatering, recharge, well pumping (when to use or not) and took no action.</p>
6	Status of Working Groups	January 22 April 16 July 16 October 15	<ul style="list-style-type: none"> <li>Receive updates on the status of the working groups. <b>(Action)</b></li> <li>Submit requests to the Board, as appropriate.</li> </ul>	<p><b>Accomplished January 22, 2018:</b> The Committee received an update on the working groups and will update the spreadsheet for 2018.</p> <p><b>Accomplished April 16, 2018:</b> The Committee received an update from Dr. Arthur Keller on Climate Change Mitigation and Climate Change and Sea Level Rise Adaptation working groups to set meeting dates.</p>

Yellow = Update Since Last Meeting

Blue = Action taken by the Board of Directors

# 2018 Work Plan: Environmental and Water Resources Committee

Update: July 2018

ITEM	WORK PLAN ITEM	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
7	Review of Environmental and Water Resources Committee Work Plan, the Outcomes of Board Action of Committee Requests and the Committee's Next Meeting Agenda	January 22 April 16 July 16 October 15	<ul style="list-style-type: none"> <li>Receive and review the 2018 Committee work plan. <b>(Action)</b></li> <li>Submit requests to the Board, as appropriate.</li> </ul>	<p><b>Accomplished January 22, 2018:</b> The Committee reviewed the 2018 work plan and took the following action:</p> <ul style="list-style-type: none"> <li>✓ Receive information on Salmonid in the District's waterways.</li> <li>✓ Overview of District's Flood Protection Management Plan to an action item.</li> <li>✓ Remove Habitat Conservation Plan and add receive FAHCE Update as an action item.</li> </ul> <p><b>Accomplished April 16, 2018:</b> The Committee reviewed the 2018 work plan and through the Chair added the One Water Plan for January 2019, moved FAHCE Update to October 15, 2018, agenda and moved the Salmonid in the District's waterways referencing Dr. Jerry Smith's Letter (distributed at 1/22/18, meeting) to July 16, 2018, agenda.</p>
8	Habitat Conservation Plan	Remove	<ul style="list-style-type: none"> <li>Update on the Habitat Conservation Plan <b>(Action)</b></li> </ul>	<p><b>Accomplished January 22, 2018:</b> The Committee chose to remove agenda item HCP and add FAHCE as an action item.</p>
9	Update on Flood Protection Management Plan	April 16	<ul style="list-style-type: none"> <li>Receive information on the Flood Protection Management Plan. <b>(Action)</b></li> </ul>	<p><b>Accomplished April 16, 2018:</b> The Committee received information on the Flood Protection Management Plan and asked that they receive an update in October.</p>

Yellow = Update Since Last Meeting

Blue = Action taken by the Board of Directors

Attachment 1

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# 2018 Work Plan: Environmental and Water Resources Committee

Update: July 2018

ITEM	WORK PLAN ITEM	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
10	Review and Comment to the Board on the Fiscal Year 2019 Proposed Groundwater Production Charges	April 16	<ul style="list-style-type: none"> <li>Review and comment to the Board on the Fiscal Year 2019 Proposed Groundwater Production Charges. <b>(Action)</b></li> <li>Provide comments to the Board, as necessary.</li> </ul>	<p><b>Accomplished April 16, 2018:</b> The Committee reviewed and commented on the Fiscal Year 2019 Proposed Groundwater Production Charges. A vote to approve staff's recommendations failed.</p>
11	Receive information on Salmonid in the District's waterways referencing Dr. Jerry Smith's Letter (distributed at 1/22/18, meeting).	July 16	<ul style="list-style-type: none"> <li>Receive information on Salmonid in the District's waterways. <b>(Action)</b></li> </ul>	
12	Climate Change Mitigation – Carbon Neutrality by 2020 Program Update	October 15	<ul style="list-style-type: none"> <li>Receive information on climate change mitigation – carbon neutrality by 2020 program update. <b>(Action)</b></li> <li>Provide comments to the Board, as necessary.</li> </ul>	
13	Energy Use Policy Discussion	October 15	<ul style="list-style-type: none"> <li>Discuss any District energy policies. <b>(Action)</b></li> <li>Provide comments to the Board, as necessary.</li> </ul>	
14	Discussion on Environmental Issues- Endangered Species, Drought Environmental Impacts	October 15	<ul style="list-style-type: none"> <li>Discuss the environmental issues- endangered species, drought environmental impacts. <b>(Action)</b></li> <li>Provide comments to the Board, as necessary.</li> </ul>	

Yellow = Update Since Last Meeting

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Attachment 1  
Page 4 of 6

ITEM	WORK PLAN ITEM	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
15	FAHCE Update	October 15	<ul style="list-style-type: none"> <li>Receive an update on FAHCE <b>(Action)</b></li> <li>Provide comments to the Board, as necessary.</li> </ul>	
16	Receive information on Climate Change And the District's policy response regarding flooding, sea level rise, wildfires.	October 15	<ul style="list-style-type: none"> <li>Receive information on climate change and the District's policy response regarding flooding, sea level rise, wildfires. <b>(Action)</b></li> <li>Provide comments to the Board, as necessary.</li> </ul>	
17	Climate Change and Sea Level Rise Adaptation – Water Supply, Flood Protection, Ecosystems Protection	October 15	<ul style="list-style-type: none"> <li>Receive information on climate change and sea level rise adaptation, Water Supply, Flood Protection and Ecosystems Protection. <b>(Action)</b></li> <li>Provide comments to the Board, as necessary.</li> </ul>	
18	Discussion on the District's Water Resources Protection Ordinance	TBD	<ul style="list-style-type: none"> <li>Discuss the District's Water Resources Protection Ordinance. <b>(Action)</b></li> <li>Provide comments to the Board, as necessary.</li> </ul>	

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ITEM	WORK PLAN ITEM	MEETING	INTENDED OUTCOME(S) (Action or Information Only)	ACCOMPLISHMENT DATE AND OUTCOME
19	District's environmental audit of disposable (paper and plastic ware) products pertaining to their food services.	TBD	<ul style="list-style-type: none"> <li>• Receive information of the District's environmental audit of disposable (paperware) products pertaining to their food services. <b>(Information)</b></li> <li>• Provide comments to the Board, as necessary.</li> </ul>	

Yellow = Update Since Last Meeting

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**Committee Officers**

Loren Lewis, Committee Chair  
Arthur M. Keller, Ph.D., Committee Vice Chair

**Board Representative**

Tony Estremera, Board Representative  
Nai Hsueh, Board Alternate  
Linda J. LeZotte, Board Representative

**DRAFT AGENDA**

**ENVIRONMENTAL AND WATER RESOURCES COMMITTEE**

**MONDAY, OCTOBER 15, 2018**

**6:00 p.m. – 8:00 p.m.**

**Santa Clara Valley Water District  
Headquarters Building Boardroom  
5700 Almaden Expressway  
San Jose, CA 95118**

**Time Certain:  
6:00 p.m.**

**1. Call to Order/Roll Call**

**2. Time Open for Public Comment on Any Item Not on Agenda**

*Comments should be limited to two minutes. If the Committee wishes to discuss a subject raised by the speaker, it can request placement on a future agenda.*

**3. Approval of Minutes**

3.1 Approval of Minutes – July 16, 2018, meeting

**4. Action Items**

4.1 Climate Change Mitigation – Carbon Neutrality by 2020 Program Update  
(Kurt Arends)

**Recommendation: This is a discussion item and the Commission may provide comments if applicable, however no action is required.**

4.2 Energy Use Policy Discussion (John Brosnan)

**Recommendation: This is a discussion item and the Committee may provide comments, however, no action is required.**

4.3 Discussion on Environmental Issues-Endangered Species, Drought Environmental Impacts (Melanie Richardson)

**Recommendation: This is a discussion item and the Commission may provide comments if applicable, however no action is required.**

4.4 Receive information on Climate Change and the District's policy response regarding flooding, sea level rise, wildfires (Vincent Gin)

**Recommendation: This is a discussion item and the Committee may provide comments, however, no action is required.**

4.5 FAHCE Update (Vincent Gin)

**Recommendation: This is an action item to provide comment to the Board in the implementation of the District's mission as it applies to staff's groundwater production charge recommendation for FY 2018–19.**

Attachment 2  
Page 1 of 3

4.6 Climate Change and Sea Level Rise Adaptation – Water Supply, Flood Protection, Ecosystems Protection (Vincent Gin)

**Recommendation: This is a discussion item and the Committee may provide comments, however, no action is required.**

4.7 Update from Working Groups (Committee Chair)

**Recommendation: Provide comment to the Board in the implementation of the District's mission as it applies to the working groups' recommendations.**

4.8 Review Environmental and Water Resources Committee Work Plan, the Outcomes of Board Action of Committee Requests and the Committee's Next Meeting Agenda (Committee Chair)

**Recommendation: Review the Board-approved Committee work plan to guide the committee's discussions regarding policy alternatives and implications for Board deliberation.**

**5. Clerk Review and Clarification of Committee Requests to the Board**

*This is a review of the Committee's Requests, to the Board (from Item 4). The Committee may also request that the Board approve future agenda items for Committee discussion.*

**6. Reports**

*Directors, Managers, and Committee members may make brief reports and/or announcements on their activities. Unless a subject is specifically listed on the agenda, the Report is for information only and not discussion or decision. Questions for clarification are permitted.*

6.1 Director's Report

6.2 Manager's Report

6.3 Committee Member Reports

**7. Adjourn: Adjourn to next regularly scheduled meeting at 6:00 p.m., **January 28, 2019**, in the Headquarters Building Boardroom, 5700 Almaden Expressway, San Jose, CA 95118.**

All public records relating to an open session item on this agenda, which are not exempt from disclosure pursuant to the California Public Records Act, that are distributed to a majority of the legislative body will be available for public inspection at the Office of the Clerk of the Board at the Santa Clara Valley Water District Headquarter Building, 5700 Almaden Expressway, San Jose, CA., 95118, at the same time that the public records are distributed or made available to the legislative body.

The Santa Clara Valley Water District will make reasonable efforts to accommodate persons with disabilities wishing to attend committee meetings. Please advise the Clerk of the Board office of any special needs by calling 1-408-630-2277.

*Environmental and Water Resources Committee's Purpose and Duties*

The Environmental and Water Resources Committee of the Santa Clara Valley Water District is established to assist the Board of Directors (Board) with policies pertaining to water supply, flood protection and environmental stewardship.

The specific duties are:

- Prepare policy alternatives;
- Provide comment on activities in the implementation of the District's mission; and
- Produce and present to the Board an Annual Accomplishments Report that provides a synopsis of the annual discussions and actions.

In carrying out these duties, Committee members bring to the District their respective expertise and the interests of the communities they represent. In addition, Committees may help the Board produce the link between the District and the public through information sharing to the communities they represent.