

**Water Forum II
July 10, 2020**

Foundational Briefing #1. Climate Change

Meeting-At-A-Glance:

- Tony Firenzi and colleagues from Placer County Water Agency (PCWA) presented the first “foundational briefing,” as part of the Water Forum II Negotiating Steering Committee (NSC). This session, open to the public, aimed to establish a shared foundational understanding about climate change to inform the future Water Forum II Agreement.
- Water Forum members had the opportunity to ask clarifying questions and request additional data.

SUMMARY

On July 10, 2020 the Water Forum held the first in a series of educational presentations and discussions (“foundational briefings”) taking place in special meetings of the Water Forum II Negotiating Steering Committee (NSC). These sessions intend to establish a foundation and shared understanding about cross-cutting issues that will inform various elements of the Water Forum II Agreement. The meeting was held virtually, due to the ongoing Covid-19 pandemic.

CLIMATE CHANGE FOUNDATIONAL BRIEFING

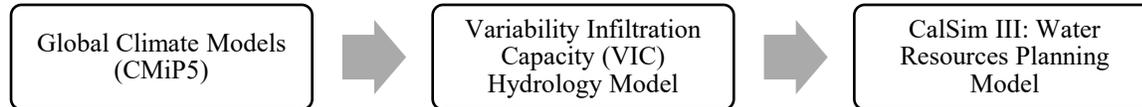
Tony Firenzi, Brian Rickards, and Darin Reintjes from Placer County Water Agency (PCWA) led the Climate Change presentation. They provided an overview of climate change efforts as part of the [American River Basin Study](#) (Study) and responded to questions compiled by representatives from the Environmental Caucus.

STUDY OVERVIEW, OBJECTIVES, AND NEXT STEPS: The American River Basin Study (ARBS) is a joint effort between the U.S. Bureau of Reclamation and six non-federal cost-sharing partners: Placer County Water Agency (PCWA), City of Roseville, City of Sacramento, El Dorado County Water Agency (EDCWA), City of Folsom, and Regional Water Authority (RWA). The Study’s purpose is to refine and update the data, tools, analyses, and regionally specific mitigation and adaptation strategies for the American River Basin (Basin). This study is primarily focused on identifying water supply and demand imbalances under various climate scenarios. Next steps include (1) compiling management actions to address regional vulnerabilities, (2) formulating adaptation portfolios, and (3) identifying long-term strategies to deal with imbalances. The draft report is not yet available for public review.

OBSERVABLE DATA– Overall, the Basin has seen warmer temperatures (3-degree Fahrenheit increase in average annual temperature), a substantial decline in numbers of days with freezing temperatures, and a sharp decline in spring runoff, indicative of a decrease in snowmelt.

CLIMATE MODELS– Climate models used in the Study are based on a series of global coordinated model experiments known as Coupled Model Intercomparison Project (CMIP5), under 4 emission scenarios or RCPs (Representative Concentration Pathways). The Study analyzed 32 global climate models for 2 emission scenarios (8.5 business as usual and 4.5 more proactive mitigation), creating 64 downscaled models into the watershed. The group used statistical analysis to take the

average outcome of 64 models, scatter them, and identify six representative scenarios to analyze. Then, the Study used the climate scenarios in the Variable Infiltration Capacity (VIC) Hydrology Model to estimate changes to the historical hydrology and apply it to the CalSim III water resources planning model.



HIGH LEVEL MODELING RESULTS:

Future Changes in Temperature: PCWA evaluated detailed results on three scenarios (Warm-Wet, Central Tendencies, and Hot-Dry) to capture the full spectrum of conditions, with a range of 4 to 7-degree Fahrenheit warming. On average, temperature and precipitation change by season (shown in Table 2 below).

Table 2. Ensemble median projected change in basin-averaged precipitation and temperature over the ARBS Study Area from 1980-2009 to 2070-2099

Projected Future Change in Climate Variables				
	Precip (% Δ)	Tavg (°F)	Tmax (°F)	Tmin (°F)
Fall	-6.0	5.8	6.1	5.5
Winter	4.7	4.9	5.0	4.8
Spring	-11.9	5.8	6.3	5.1
Summer	10.4	7.2	7.3	7.0

** Note: Projected change was calculated by comparing the basin-averaged ensemble-median projection for the ARBS study area between the historical period 1980-2009 and future period 2070-2099. Precip = percent change in basin-averaged annual mean precipitation, Tavg = change in basin-averaged annual mean daily surface air temperature, Tmax = change in annual mean of daily maximum surface air temperature and Tmin = change in annual mean of daily minimum surface air temperature.*

Snowpack: Snowpack will be strongly impacted under all of the projected climate scenarios, which will have severe impacts on water supply. On average, historically there is approximately 1 million-acre-feet of snow-water equivalent in the Basin at the peak of snowpack (March-April). Climate change will reduce snowpack anywhere from 50-75% in the American River Basin. Historically 21.6% of precipitation falls as snow; under different climate scenarios it is projected to drop to between 5.3-8.2%. Total runoff is not expected to reduce significantly, but it is expected to fall as rain not snow.

Implications for Folsom Reservoir: Historically, peak discharge occurs in early spring. Under climate change conditions, peak discharge will be earlier (middle of winter), which coincides with Folsom flood operations. This has the potential to cause major impacts by increasing the change of spills from Folsom reservoir during flood season and reducing water supply availability during summer and fall for Municipal & Industrial (M&I), ecosystems, hydropower, irrigation, recreation,

and other uses. Under the central tendency and hotter drier scenario, without adaptation and mitigation strategies in place, the Basin could experience a dead pool situation about 1 in every 8 years.

Lower American River Temperature: Increase in temperatures under hot/dry scenarios could lead to as much as a 7-degree increase in river temperatures by the end of September (up to 74 degrees). Conditions could be worse during drought.

Water Supply-Demand Imbalance: See Table 6-2 below.

Table 6-2. Existing and 2070 Water Supply-Demand Balances in the American River Basin (TAF /year)

Area	Existing Conditions ¹	2070 Central Tendency	2070 Hot-Dry	2070 Warm-Wet
Lower Basin (Valley Floor)				
Total Annual Demand	1083	1278	1332	1278
Demand Met by Surface Water	701	803	789	835
Demand Met by Groundwater (2)	378	466	533	440
Total Water Supply	1079	1269	1322	1275
Increased Groundwater Extraction Compared to Existing Conditions ²	-	+88	+155	+62
Upper Basin (Foothills)				
Total Annual Demand	104	211	222	202
Demand Met by Surface Water	100	134	135	137
Demand Met by Groundwater	1	1	1	1
Total Water Supply	101	135	135	138
Supply-Demand Imbalance	3	76	87	63

Notes:

1. Existing Conditions reflect 2015 level of demand and historical hydrology (1922 to 2015)

2. CalSim 3.0 does not limit groundwater extractions to meet demands if surface water supplies are limited in the Valley Floor. An increase in groundwater extractions compared to Existing Conditions is an indicator of stresses on Valley Floor. An increase in groundwater extraction compared to Existing Conditions is an indicator of stresses on Valley Floor surface water supplies under Future Baseline conditions.

Key Regional Water Vulnerabilities: The Study identified five key vulnerabilities in the Basin: (1) limited Folsom reservoir capacity given potential increases in watershed runoff, (2) reliance on snowpack, (3) wildfire risk and water quality impacts, (4) local, state, and federal reliance on surface water, and (5) siloed groundwater management. Greater integration among agencies represents an important water management opportunity.

Adaptation Portfolios: The Study advocates for a “Super-shed” concept: holistic thinking and greater integration, proactive management, environmental stewardship, and reliability of supply needs. The presenters briefly discussed the following strategies:

- (1) Foundational institutions: demand management, execution of pending Central Valley Project (CVP) contracts, accelerated CVP water transfer programs permitted under the Central Valley Project Improvement Act (CVPIA), alignment of CVP service area with Pace of Use, and forest management.
- (2) Alder Creek Storage and Conservation Project: add an upper watershed storage to replace some of lost snowpack and increase Folsom Reservoir flexibility.

- (3) Sacramento River Diversion Project: shift some of the American River and Folsom Reservoir diversions to the Sacramento River.
- (4) Federally Recognized Groundwater Bank: expand conjunctive use in the north and south American Groundwater Basin using in-lieu recharge and Aquifer Storage & Recovery (ASR).
- (5) Folsom Dam Raise and Groundwater Banking: use flood flows for groundwater banking along the Cosumnes River.
- (6) Modified Flow Management Standards: Implement Modified Flow Management Standard (MFMS) and December target storage in Folsom, Spring pulse flow, and Folsom Dam temperature control device.

DISCUSSION – KEY THEMES

The PCWA team provided additional information based on questions from participants. Below is a summary of the topics covered.

- **Cluster Scenarios – Climate Modeling:** The PCWA will follow up on the level of consistency among models across different scenarios identified in the cluster statistical analysis for the different time periods represented (2050, 2070, 2085).
- **Updating Climate Models:** Due the level of effort and resources involved in downscaling the global climate models to VIC modeling to CalSim III modeling (e.g. hiring consultants, climate scientists, etc.), updating the climate models will not happen often, every 10 years or so. Instead, water managers will need to adaptively manage as climate change impacts are felt in real time, with periodic check-ins. Where more could be done is the modeling of projects using CalSim III.
- **Differences between the ARBS the DWR climate analysis:** The ARBS is more rigorous. The DWR guidance through the Sustainable Groundwater Management Act (SGMA) is not necessarily a true climate change analysis, rather a post-process analysis. Each GSP has to conduct hydro-dynamic modeling to estimate water budgets for the basin. What DWR provides is at an extremely high level, requiring Groundwater Sustainability Plans (GSPs) to account for more granular climate impacts when analyzing water budgets. The datasets offered can be used as percent reductions based on evapotranspiration to take model output and account for changes in climate. The ARBS analysis is more sophisticated than the DWR guidance for both GSPs and Urban Water Management Plans (UWMPs).
- **Folsom Lake Storage:** There were some errors in the original analysis, portraying more drastic conditions which led to PCWA making revisions in the Folsom Lake storage graph shown in the presentation. Further, increased precipitation in winter in the form of rain can cause extreme flooding events. Information is needed at a daily or even hourly basis. Current hydrological modeling (CalSim) accounts for that flow in the system and captures these changes.
- **Use of Data:** The draft report will be circulated to sponsors (non-federal sponsors) and federal staff to incorporate reviews and comments. Additional technical work is still needed. The report is anticipated to be made available for public review by year-end. The report aims to identify supply and demand imbalances, as well as strategies to manage those imbalances. The next steps include feasibility studies to evaluate the different adaptation alternatives.

PCWA recently received a federal grant to analyze the Sacramento diversion project and water bank.

- **Water Imbalance in the Foothills:** Regarding the viability of the strategies mentioned to address water supply and demand imbalances, particularly in the foothills where they lack reliable groundwater, the PCWA stated they have yet to conduct the feasibility studies. They see benefit in viewing the region through an integrated lens and analyzing strategies in the lower basin to benefit the foothills area. Further, portfolios will look beyond reliance on groundwater. An EC member encouraged PCWA to look at where the imbalance is occurring and what sources will be used to meet that demand.
- **Climate Extremes:** The EC expressed concerns with the tendency to gravitate towards the central tendency when evaluating climate scenarios. This tendency could leave the region unprepared to address high impact, low-probability extremes. PCWA representatives highlighted that one of the emission scenarios analyzed in the study (hot-dry) represents a worst-case scenario. Does it provide any insight in terms of length/depth of critical periods? PCWA has the flexibility to apply climate change scenarios to their historical data set (1915-2015). However, some argue 100 years of data is not enough. It is possible to evaluate tree ring data.
- **Demand Management** (Slide 24): Represents the business-as-usual scenario combined with climate change, so the -155 KAF imbalance is not reflective of any adaptation strategies. Water conservation and demand management will play a role in reducing the imbalance.
- **Soil Erosion:** In relation to the implications of climate change on soil erosion, the PCWA acknowledged the importance of that analysis and granular modeling (i.e., sediment transport modeling) exists to evaluate soil erosion. However, this would require significant time and resources and falls beyond the scope of this ARBS. That said, the King Fire has had devastating impacts leading to significant sediment loading into reservoirs.

OUTCOMES AND NEXT STEPS:

- PCWA follow-up on the following data requests:
 - Bubble Chart for Hot-Dry Scenario: Change in snowmelt, impacts of runoff changes in water supply availability.
 - Scatter plots: which models were identified across time periods.
 - Water Conservation results on demand/supply imbalance—all of the portfolios, % of solutions they can offer, location, and feasibility.
- CBI distribute the Climate Change questions submitted among all participants.
- Debrief presentation in EC and identify if there are any follow-up questions.
- Collectively think of the types of policy statements and recommendations to provide guidance to water resources management processes in the region, regarding Climate Change.
- Two more foundational briefings coming up. See table below.

Topic	Date and Time	Presenter
Climate Change	July 10 th – 2-4 PM	Tony Firenzi, Placer County Water Agency
Fisheries	July 16 th – 9-10:30 AM	Chris Hammersmark, CBEC
Groundwater & Surface Water	August 4 th – 11-1 PM	Rob Swartz, RWA/SGA

MEETING PARTICIPANTS

Water Forum II Foundational Briefings (Summer 2020): **DRAFT** Compiled Summaries

Name	Affiliation	NSC Membership
Water Caucus		
Dan York	Sacramento Suburban Water District	Primary Representative
Greg Zlotnick	San Juan Water District	Primary Representative
Jim Peifer	Regional Water Authority (RWA)	Primary Representative
Paul T. Schubert	Golden State Water	Primary Representative
Tony Firenzi	PCWA	Primary Representative
Marcus Yasutake	City of Folsom	Alternate
Paul Helliker	San Juan WD	Alternate
Sean Bigley	City of Roseville	Alternate
Andrew Fecko	Placer County Water Agency (PCWA)	NA
Ansel Lundberg	Sacramento Municipal Utility District (SMUD)	NA
Brett Ewart	City of Sacramento	NA
Brian Rickards	PCWA	NA
Chris Norem		NA
Dan Corcoran	El Dorado Irrigation District (EID)	NA
Darin Reintjes	PCWA	NA
Dave Underwood	<i>Sacramento County Water Agency</i>	NA
Greg Schwart		NA
I-Pei Hsiu	EBMUD	NA
Ken Payne	EDWA	NA
Kevin Thomas	Director SSWD	NA
Le Johnson		NA
Rob Swartz	RWA/SGA	NA
Public Caucus		
Kerry Schmitz	Sacramento County	Primary Representative
William Busath	City of Sacramento	Primary Representative
Michael Grinstead	City of Roseville	Primary Representative
Environment Caucus		
Ted Rauh	Environmental Council of Sacramento (ECOS)	Primary Representative
Ronald Stork	Friends of the River (FOR)	Primary Representative
Clyde Macdonald	Save the American River Association	Primary Representative
Barbara Leary	Sierra Club Motherlode Chapter	Primary Representative
Rob Burness	Sierra Club Motherlode Chapter	Primary Representative
Melinda Frost-Hurzel	Cosumnes Coalition	Alternate
Barbara Evoy	Retired*	Alternate
Chris Brown	Sacramento Climate Coalition	Alternate
Allan James	University of South Carolina	Alternate
Other		
Chris Hammersmark	CBEC	
Paul Selsky, PE	Brown and Caldwell	
Roshini Das		
Noelle Mattock	El Dorado Hills CSD Board	NA
Water Forum Staff & Facilitator		
Tom Gohring	Water Forum	
Lilly Allen	Water Forum	
Tania Carlone	Consensus Building Institute (CBI)	
Mariana Rivera-Torres	Mariana Rivera-Torres, CBI	

**Water Forum II
July 16, 2020**

Foundational Briefing #2. Fisheries

Meeting-At-A-Glance:

- Received a presentation on the status of Lower American River fisheries from Chris Hammersmark, cbec, Inc., consultant to the Water Forum.

BACKGROUND

The Water Forum convened meeting #4 of the Negotiating Steering Committee (NSC) on July 16, 2020. The meeting was divided into two parts: 1) a foundational briefing for the broader Plenary and interested parties on the status of Lower American River (LAR) fisheries by Chris Hammersmark, PhD, PE, cbec, Inc. Ecoengineering and Water Forum (WF) consultant; and, 2) a regular monthly meeting of the NSC. The meeting, conducted via webinar as a result of Covid-19 restrictions on in-person meetings, was attended by 13 NSC representatives and 9 alternates from the water, environmental and public caucuses in addition to Water Forum staff and approximately 20 observers. The Consensus Building Institute (CBI) facilitated the meeting. A list of meeting participants is attached.

DISCUSSION – KEY THEMES

Below is a summary of key themes and next steps discussed at the meeting. This summary is not intended to be a meeting transcript. Rather, it focuses on the main points covered during the presentation and group discussions.

Welcome, Introductions and Agenda Review

The meeting began with a brief welcome from CBI Senior Mediator Bennett Brooks, as well as a review of the agenda and groundrules. Tom Gohring, WF Executive Director, welcomed participants explaining that the purpose of the foundational briefings is to provide an opportunity for WF members to have a common understanding of foundational topics likely to inform multiple aspects of the WFII negotiations. A series of presentations comprise the learning phase of the effort. T. Gohring expressed the need to do a better job of explaining the purpose of these sessions to the WF community.

PART I – FOUNDATIONAL BRIEFING PRESENTATION ON THE STATUS OF THE FISHERY

Presentation: Status of Lower American River (LAR) Fishery, Chris Hammersmark, CBEC

C. Hammersmark gave an overview of the presentation, noting that he would discuss: the status of Chinook salmon and steelhead in the LAR; hatchery operations and effects; spawning and rearing habitat; water temperature suitability for salmonids; update of Temperature Control Device Upgrade; update on Nimbus Fish Ladder Project; and related Water Forum actions, followed by questions and answers.

Central Valley Fall Run Chinook Salmon

C. Hammersmark highlighted that Chinook salmon are the only salmon species in the Central Valley and a federal Species of Special Concern. The principal threats they face are: 1) lack of genetic diversity among hatchery-raised fish; 2) degradation of estuaries; and, 3) and diversion of water from the system for uses like agriculture. He noted that their current range is 1/3 of what it was historically.

AFRP Doubling Goal

The United States Fish and Wildlife Service (USFWS) Anadromous Fish Restoration Program (AFRP) goal is to make all reasonable efforts to at least double natural production of anadromous fish in California's Central Valley streams on a long-term, sustainable basis. The reality in the LAR is falling well short of the doubling goal. The AFRP Production target for 1992-2015 was 160,000 adults but it is important to note that this translates to an escapement of 98,419 adult fish. Escapement is the number of fish that return to their natal stream.

LAR Fall-run Chinook Salmon Population Crash

The early 2000s production and escapement (number of fishes that make it back to the river) were good followed by a crash in the population (circa 2006-2009). The National Marine Fisheries Service (NMFS), in a technical memo, identified the following causes of the crash: 1) ocean conditions of 2004-2005 where there was warm surface water and low density of food, which essentially created a food desert for young/juvenile fish; 2) hatcheries: fish are not genetically diverse, making salmon less resilient and therefore vulnerable to boom and bust cycles; and 3) poor fisheries management.

Discussion: One Water Caucus (WC) member asked if water management had any bearing on the crash. C. Hammersmark responded that contributing factors related to water management are limited habitat. Regarding water releases, NMFS did not identify that as a cause. When asked how the status of fisheries on the LAR compares to other Sacramento River streams, C. Hammersmark indicated that the LAR is fairly similar to upper Sacramento and Feather River and is dealing with the same group of issues, particularly hatchery management.

Status of Steelhead

Steelhead habitat is much contracted from what it once was. Habitat is confined to the lower 23 miles of the LAR because of Terminal Rim Dams. Steelhead were federally listed as threatened in 1998. The primary threats to steelhead are: 1) dams; 2) degradation to estuaries; and, 3) genetically limited hatchery production. Cramer Fish Sciences recent presentation at the American River Group (ARG) observed:

- Fewer than 200 redds (except in 2013 when there was a spike)
- Several years less than 100 redds
- Spawning estimate is 100-200 redds
- Fish are utilizing larger portions of the river, where they are observed as far downstream as River Mile 5/5.5
- Population estimate shows that larger numbers of fish return to the hatchery – a much larger number than those that return to the river.

Discussion: A WC member asked what caused the spike of redds in 2013 and what accounted for the difference between steelhead and salmon numbers. C. Hammersmark explained that steelhead are different from Chinook salmon, who tend to return to the river every three years. Steelhead are more variable and, therefore, a direct comparison cannot be drawn.

Hatchery Story

Hatchery fish are raised in ways that limit their ability to survive in the river. They are raised in concrete raceways, trained to look to the surface for food and are not afraid of predators. The fish are released into the natural environment by being trucked further downstream. This is done because the fish have very low levels of survival and are highly susceptible to mortality (predation and other) as they navigate the river. 100% of all steelhead are marked, and anglers are not allowed to take a natural fish.

What do we know about the fish?

- On average, 2/3 hatchery fish return to the hatchery; 1/3 try to spawn in river.
- 80% or more of the natural fish return to the river.

Clarification: Natural fish are those born in the river but could come from hatchery parents and shouldn't be thought of as wild fish.

Discussion: One participant asked if rainbow trout and steelhead are the same fish genetically and if there was any distinction. C. Hammersmark responded that they are the same species and may choose to go to the ocean or not. A lot of river management has allowed fish to stay in the river longer or fish are upstream of dams and cannot return to the ocean.

Hatchery fish are tagged to inform which fish are coming back.

- 87% came back
- ¾ of returning fish were from the LAR
- There is a significant amount of straying from home rivers, further blending genetics into one domesticated salmon

California Hatchery Management Review Project

A California hatchery scientific review group developed standards and guidelines for:

- Broodstock management to guide the selection for fish for broodstock
- Program size and release strategies to help determine program production goals and manner of release
- Incubation, rearing and fish health management to guide hatchery operations following broodstock spawning
- Monitoring and evaluation (including marking/tagging programs) to determine the performance and impacts of hatchery fish
- Assessing the effects of hatchery operations on local habitats, aquatic and terrestrial species

Expected Outcomes from Following Guidelines

- Reduction in the domestication of hatchery fish
- Reduction in the negative impacts of hatchery fish on natural spawning populations
- Improved prospects for the long-term successful co-existence of hatchery and natural fish

Improving Hatcheries

- Physical segregation of natural and hatchery fish to reduce mortality
- Genetic segregation—valid genetics as wild as possible

Improving hatcheries is a contentious topic. But C. Hammersmark noted that the hatchery programs have bred fish that don't do well in the natural environment. Wild fish are more fit and productive and more likely to return (there is a .1% return rate for hatchery fish).

Rearing Habitat Needs: How much do we need?

- Nook and cranny habitat
- Food
- ½ foot to 4 feet water depth ideal
- Velocity should not be high since young fish need to gain weight and shouldn't have to work hard to hold

Habitat Availability: How much do we have?

There is a rearing habitat deficit. Even at 30K cubic feet per second (cfs), there is much less rearing habitat than what is needed to support fish populations. Chinook salmon need high quality inter-gravel flow, as they spend 2-3 months in gravel.

Depth, velocity, substrate size—findings

Optimum flow is approximately 1900 cfs for Chinook salmon. As flow increases, spawning habitat decreases and redds get washed out. Steelhead are similar with slightly different optimal flow needs at 1600 cfs. The LAR doesn't have enough spawning habitat to support doubling goals.

Water Temperature Suitability

Salmonids are ectoderms that like cold water. They can live at temperatures above what's tolerable but they cannot thrive. Current river temperatures are not optimal. Temperatures above tolerable levels will cause salmonids to diminish and die in time. Compared to temperature indices—present temperatures in summer months are challenged even without future climate change. We can expect temperatures to increase 7 degrees over time. In future, there will be significant temperature challenges ahead.

Folsom Temperature Control Devices (TCDs)

Each penstock has its own TCD which allows choice as to what temperature of water is released. However, the releases only occur at three elevations in the reservoir, thereby limiting the ability to regulate the temperature and leading to less-than-optimal use of the cold-water pool. If addressed, there is the potential for temperature improvements. Currently, the different releases need to be scheduled. The Army Corps has (2014) TCD designs that would automate the system and create more flexibility, address leakage and could create an elephant's trunk or other method for accessing cold water below the Folsom Dam penstocks (although not immediately).

Nimbus Fish Ladder Project

Flume ladder would pull fish from below Nimbus. It wouldn't require operation of barrier weir which is planned for removal within five years. The start date of the project is later this year with completion planned for next year.

Discussion: One EC member asked how the fishway gets water. C. Hammersmark replied that water is introduced through auxiliary attraction flow pipelines in two locations which trick the fish into thinking they are swimming into a tributary.

What is Water Forum doing to help?

- Habitat Enhancement: Have completed eleven projects, and counting (25% of redds (926) occurred in the habitat restoration area)
- Flow Management Standard (FMS)
- Temperature monitoring and modeling
- Models—fish mortality
- Habitat mapping
- Constant presence at the ARG

Discussion: A WC member asked what activities the Water Forum is not doing that it could? C. Hammersmark emphasized the essential importance of continuing habitat projects and to move towards rearing habitat which is currently a gap.

1. Keep up what the Water Forum's current activities.
2. Engage with Bureau of Reclamation at every turn in the road.
3. Push on temperature management infrastructure (get involved with TCD Design)—HDR is advancing design
4. Identify actions to take at Lake Natoma/Nimbus—not easy but needs to happen
5. FMS is important

6. Big gorilla in the room is hatchery management. Not sure if Water Forum wants to engage in what is a very contentious, tricky issue

Other Possibilities

- Could introduce new genetics. Currently steelhead come from Eel River genetics. It would be possible to introduce genetics from rainbow trout upstream.

Discussion: One EC member mentioned that Dr. Peter Moyle, UCD and Dr. Jacob Katz, CalTrout, wrote a recent blog suggesting hatcheries be moved downstream to leave rivers to natural spawners. C. Hammersmark expressed that it's a great idea to leave the natural environment to the natural spawners which would limit competition for resources and reduce inbreeding. It would also reduce mortality and avoid the fish needing to run the gauntlet of the river (which is done through trucking now). Hatcheries are in the business of growing fish. There is political resistance to change but it seems feasible. Another EC member noted that to improve rearing habitat requires increased flows and asked how that might occur. C. Hammersmark said that rearing habitat improvements could occur in two ways: 1) through increased incremental flow; 2) through a non-flow modifications and revegetation to get the right depth and velocity which could occur within the current flow regime. The reality is that it's an altered state where fish are forced to live their lifecycle on the baking hot valley floor.

The final questioner asked how much effort would be needed to maintain what the WF has done given the project future condition? C. Hammersmark emphasized the importance of keeping up the work, particularly noting:

1. Spawning habitat: no course sediment is passing dams. We expect gravel augmentation will go on forever since the river is sediment starved.
2. Rearing habitat—evolves but requires less maintenance. Plants get larger, habitat improves. Requires maintenance to side channels and coves, weed removal.

B. Brooks thanked C. Hammersmark and informed participants that the fisheries presentation was the second of three or more sessions. The next learning session will focus on groundwater and surface water. It's a special meeting of the NSC. The date has yet to be set. Observers are welcome. The conversation is mainly among NSC members. Water Forum staff and CBI will be creating a combined summary document of the learning sessions which will be shared at a Plenary.

Meeting Participants

NSC Representatives

Environmental Caucus

- Rob Burness, Sierra Club Motherlode Chapter
- Clyde Macdonald, Save the American River Association (SARA)
- Ted Rauh, ECOS
- Ron Stork, Friends of the River (FOR)
- Barbara Leary, Sierra Club Motherlode Chapter
- Melinda Frost-Hurzel, ECOS (Alternate)
- Chris Brown, ECOS (Alternate)
- Barbara Evoy, ECOS (Alternate)

Water Caucus

- Jim Peifer, Regional Water Authority (RWA)

- Dan York, Sacramento Suburban Water District
- Tony Firenzi, Placer County Water Agency
- Paul Schubert, Golden State Water Company
- Greg Zlotnick, San Juan Water District
- Marcus Yasutake, City of Folsom (Alternate)
- Paul Helliker, San Juan Water District (Alternate)
- Brian Poulsen, El Dorado Irrigation District (Alternate)
- Darin Reintjes, Placer County Water Agency (Alternate)
- Sean Bigley, City of Roseville (Alternate)

Public Caucus

- Bill Busath, City of Sacramento
- Ansel Lundberg, SMUD
- Kerry Schmitz, Sacramento County
- Anne Sanger, City of Sacramento (Alternate)

Water Forum Staff, Consultants & Facilitators

- Tom Gohring, Water Forum
- Chris Hammersmark, CBEC
- Bennett Brooks, Consensus Building Institute (CBI)
- Tania Carlone, CBI
- Mariana Rivera-Torres, CBI

Other Participants

- Kyle Ericson
- Jim Ray, Building Industry Association
- Jennifer Buckman
- Gerald Schwartz, EBMUD
- I-Pei Hsiu, EBMUD
- Mike Huot, SSWD
- Noelle Mattock
- Ryan Bezerra
- Felix Smith, SARA
- Ken Payne, El Dorado County Water Agency
- Roy Leidy, Carmichael Water District
- Sir Whiskey D. Williamson
- Le Johnson
- Kevin Thomas
- Craig Locke
- Dave Underwood, Sacramento County
- Cathy (last name?)

**Water Forum II
August 4, 2020**

Foundational Briefing #3. Groundwater & Surface Water

Meeting-At-A-Glance:

Received a series of presentations and engaged in discussion to establish a foundation of shared understanding on the status of groundwater in the region to inform Water Forum II negotiations. Topics included:

- an overview of the Sustainable Groundwater Management Act (SGMA);
- an introduction and update on the regional groundwater modeling effort;
- status updates from Groundwater Sustainability Agencies (GSA) on Groundwater Sustainability Planning activities in each subbasin; and
- an overview of the Water Accounting Framework and Groundwater Banking in the region.

BACKGROUND

On August 4, 2020, the Water Forum convened its third in a series of educationally focused presentations and discussions taking place in special meetings of the Water Forum II Negotiating Steering Committee (NSC). This session intended to establish a foundation of shared understanding about cross-cutting issues, such as groundwater, to inform various elements of the Water Forum II (WFII) Agreement. The meeting, conducted via webinar as a result of Covid-19 restrictions on in-person meetings, was attended by 12 NSC representatives and 6 alternates from the water, environmental and public caucuses in addition to Water Forum staff and approximately 20 observers. The Consensus Building Institute (CBI) facilitated the meeting. A list of meeting participants is attached.

DISCUSSION – KEY THEMES

Below is a summary of key themes and next steps discussed at the meeting. This summary is not intended to be a meeting transcript. Rather, it focuses on the main points covered during the presentation and group discussions.

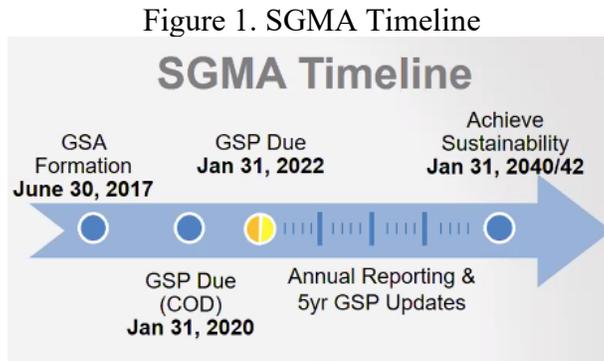
Welcome, Introductions, Agenda Review and Ground Rules

The meeting began with a brief welcome from CBI Senior Mediator, Bennett Brooks, as well as a review of the agenda and ground rules. Tom Gohring, WF Executive Director, welcomed participants, explaining that the purpose of the foundational briefings is to provide an opportunity for WF members to have a common understanding of foundational topics likely to inform multiple aspects of the WFII negotiations. A series of presentations comprise the learning phase of the effort.

[Sustainable Groundwater Management Act \(SGMA\) Overview](#)– Trevor Joseph, City of Roseville (formerly with the Department of Water Resources (DWR) Sustainable Groundwater Management Program)

T. Joseph gave an overview presentation on the California’s [Sustainable Groundwater Management Act](#) (SGMA). Passed in September 2014, SGMA aims to promote sustainable groundwater management and increase the state’s water reliability and resiliency. Only medium to high priority basins (representing 98% of the groundwater use in the state) are subject to

SGMA requiring the establishment of Groundwater Sustainability Agencies (GSAs) to develop and implement Groundwater Sustainability Plans (GSPs). Basins have 20 years to achieve sustainability and need to submit annual reports and 5-year GSP updates. The legislation defines sustainability by avoiding six “undesirable results:” (1) Lowering Groundwater Levels, (2) Reduction of Storage, (3) Seawater Intrusion, (4) Degraded Quality, (5) Land Subsidence, and (6) Surface Water Depletion. GSAs need to remain above locally set Minimum Thresholds and achieve Measurable Objectives. Critically over-drafted basins needed to submit their GSPs by January 21st, 2020, while high/medium priority basins have until January 2022 (See Figure 1 below).



Source: modified from Department of Water Resources, presentation by Trevor Joseph, 8/4/20

Roles and Responsibilities

- *Groundwater Sustainability Agencies (GSAs)* develop and implement GSPs. 99.9% of the basins were covered by GSAs by the required deadline.
- *Department of Water Resources (DWR)* has three important roles: provide (1) financial assistance; (2) planning assistance, such as Facilitation Support Services (FSS), GSA and GSP support; and, (3) technical assistance through state-wide datasets, analysis, and tools to encourage best management practices. Further, it evaluates GSPs for adequacy.
- *State Water Resources Control Board (SWRCB)* is the enforcing agency and may intervene only if local efforts fail. SWRCB can deem a basin probationary, develop interim plans, and impose a series of fees and penalties if there is no GSA formed, no plan developed by the deadline, or plans fail to avoid significant and unreasonable results.
- *Stakeholders* play a key role in the entire process as specified by the legislation.

Groundwater Sustainability Plans (GSP) Components:

- Introductory chapter focuses on **GSA administrative information**.
- **Basin Setting** chapters provide technical information describing basin conditions.
- **Sustainable Management Criteria (SMC)** establishes a locally derived sustainability goal, measurable objectives and minimum thresholds for the basin. Local agencies in consultation with stakeholders define the SMC and Monitoring Networks to measure conditions over time with outcome-based metrics.
- The plan outlines **Projects & Management Actions** to achieve sustainability.

Groundwater Dependent Ecosystems (GDEs): GDEs are one of the most important beneficial uses and a key element in the regulations. GSAs can start with DWR’s Natural Communities Commonly Associated with Groundwater (NCCAG) dataset to identify GDEs in the basin. The Nature Conservancy (TNC) has also developed useful guidance.

Intra-basin and Inter-basin Agreements: Intra-basin agreements are required when subbasins decide to prepare multiple GSPs. Inter-basin agreements are optional and exist across subbasin boundaries. Since it is very hard to define sustainability at a subbasin level, cross-boundary collaboration is key.

Discussion: One Environmental Caucus (EC) member asked if SGMA evaluates undesirable results against a baseline year and how basins will evaluate undesirable results caused by the proposed plans and management actions. T. Joseph indicated that the baseline for all GSPs is January 1st, 2015. GSAs do not need to address undesirable results that occur before that date. Further, GSPs also define minimum thresholds, which some may describe as "baselines." A minimum threshold is a level defined in a GSP, below which there would be undesirable effects [refer to p.8 in this [DWR guidance document](#)].

Sustainable Groundwater Planning throughout the Region

Regional Modeling Effort– Rob Swartz, Regional Water Authority (RWA)/Sacramento Groundwater Authority (SGA)

R. Swartz gave an overview of the regional model used in the region’s North, Central, and South subbasins. The Sacramento County’s Integrative Regional Model (SacIRWM), in place since 2000 and last updated in 2011, was state-of-the-art at the time. More recently, the DWR has endorsed the updated Regional CoSANA Model. CoSANA is a result of a collaborative process between multiple subbasins. Although there is significant information on Municipal and Industrial (M&I) production wells, there are many unknowns regarding agricultural private wells. Models can help estimate these unknowns, but calibration is better in urban areas.

<i>Model</i>	SacIRWM	Regional CoSANA
<i>Elements</i>	6,469	24,171
<i>Av. Element Size (acres)</i>	140	37
<i>Subregions</i>	70	86
<i>Layers</i>	3	5
<i>Calibration Period</i>	1970-2004	1990-2018
<i>Calibration Wells</i>	441	563

Model Uses: Regional models are used in the development of GSPs to calculate water budgets, sustainable yield, SMCs (groundwater levels, storage, surface and groundwater interactions, etc.), future conditions (climate change impacts), impact of proposed management actions, and inter-basin flows. Further, models are used in Water Bank Development to evaluate proposed operations on groundwater and surface water and to support environmental analyses.

Discussion:

- *Climate Change*: An EC member asked about how climate change would be integrated into the model and whether the GSAs would rely on DWR data or follow the American River Basin Study strategy. R. Swartz clarified that GSA will run multiple scenarios, assuming demand with current and future hydrology. However, it is up to each GSA to determine how to account for climate impacts.
- *Perched and Semi-perched Aquifers*: Another EC member inquired as to how the model deals with perched and semi-perched aquifers, especially in relation to the riparian ecosystems. R. Swartz explained model layers represent different thicknesses, allowing managers to evaluate at different depths. There is limited information on perched layers; however, extractions may not be affecting the groundwater levels in perched layers.
- *Land-use Change Projections*: Lastly, an EC member inquired about how the model accounts for and forecasts future demand linked to land-use changes. R. Swartz stated that SGMA requires a planning horizon of 50 years. GSAs base their projections on the counties' general plans to anticipate future development. Ultimately, the model can be a tool available to estimate the impact of specific development in real time.

Subbasin-Specific Presentations

North American Basin – Rob Swartz

GSP Status

The North American Basin (NAB) encompasses parts of three counties. Five GSAs were formed and are working together on a single GSP. Sacramento Groundwater Authority (SGA) is acting as the lead agency and grant administrator for GSP development.

Undesirable Results:

- *Groundwater Levels*: Overall, water levels are stable, with some exceptions. Areas with limited access to surface water (i.e., Central area, Sutter County in the early 1960s, and Sac County in the mid 1990s) have seen decline. Drought has also impacted groundwater elevations. Practicing conjunctive use has allowed water elevations to stabilize and recover. Lastly, the foothills are highly dependent on surface water, due to limited groundwater availability.
- *Surface Water/Groundwater Interactions*: GSAs are in the process of collecting data to better understand groundwater/surface water interactions with new monitoring wells near existing stream gages. Interactions in the Feather River vary across time, while the Bear River is consistently a losing river. New data can be fed into the model to evaluate patterns across time.
- *Groundwater Quality*: Most substantial contamination in the county is near the Aerojet plume. There is currently no intention to fill the existing cone of depression in the area, due to the ongoing contamination and groundwater remediation efforts that are utilizing the cone of depression to contain the plume.
- *Land Subsidence*: Land subsidence is not anticipated to be a major issue. An extensometer in Sutter has monitored very little subsidence, and a valley-wide network reported no clear detectible subsidence in the basin during the peak of the drought. Some subsidence has been observed in Yolo County.

Next Steps

The GSAs will run the model to evaluate future conditions and continue to address undesirable results, in particular groundwater levels, groundwater storage, and surface water groundwater interactions.

South American Basin– John Woodling, Sacramento Central Groundwater Authority (SCGA)

GSP Status

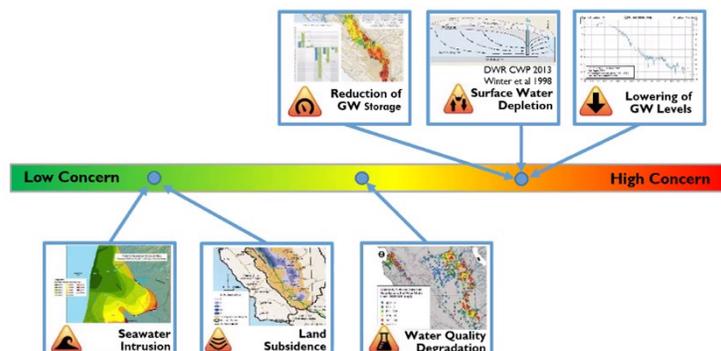
The South American Basin (SAB) has six GSAs, five of which are working on developing a single GSP. They recently adopted an MOU to share the costs. Each GSA allocated representatives to be part of a series of working groups to work with consultants in the development of GSP chapters. Since the SAB is early in GSP development activities, J. Woodling presented information from an Alternative Submittal to the DWR in 2016.

Undesirable Results:

Overall, the main undesirable results of concern in the SAB are reduction in groundwater storage, surface water depletion, and lowering of groundwater levels. Although groundwater contamination is of concern in the SAB, it is not the highest priority issue given it is within the jurisdiction of other agencies. Lastly, land subsidence and seawater intrusion are of low concern in the SAB.

- **Groundwater Levels and Storage:** Overall, groundwater extractions and urban groundwater use are declining, driven by an increase in surface water diversions and conservation. A very significant cone of depression in the western area is slowly improving. Groundwater levels in the Northeast have decreased due to groundwater remediation efforts.
- **Surface Water/Groundwater Interactions:** Since the SAB is bounded in the north by the American River, this will be an important part of GSP development in close coordination with the Cosumnes Subbasin.
- **Groundwater Quality:** The SAB has significant contamination plumes (Aerojet-General Corporation), as well as ongoing challenges with emerging contaminants in drinking water such as per and polyfluoralkyl substances (PFAS compounds). Although the GSA will track these plumes, water contamination is not the highest priority.

Figure 2: Undesirable Results in the South American and Cosumnes Subbasins



Next Steps

The SAB will be working on drafting GSP Chapters, convening topic specific working groups, and consulting with the public throughout the process. The draft GSP is expected to be developed by July 2021 and approved and submitted in January 2022.

Answers to EC Questions:

- **Groundwater Banking:** Municipal water providers are constantly working on regional water banking. How exactly will the GSA be involved is yet to be determined.
- **Solutions to overdraft:** Overdraft has been largely mitigated by increased surface water use. Conservation in urban water use is taking place, but direct actions to reduce pumping will probably not be part of the GSP. Filling cones of depression will probably not occur. Goal will be to pursue a regional strategy for conjunctive use.
- **Effects on water purveyors and other groundwater users:** GSAs will evaluate effects and costs at later stages in GSP development.
- **Crossboundary issues:** The biggest issue is around the boundary between South American and Cosumnes, and the potential impacts related to stream flow depletion. Close coordination with adjacent subbasins will take place.

Cosumnes Basin–Linda Dorn, Sacramento County Groundwater Sustainability Agency

GSP Status

The Cosumnes Basin is part of the San Joaquin Valley Basin. 7 GSAs are collaborating through a working group to develop a single GSP, operating with a cost-share agreement and framework. The Water Forum (WF) is the plan manager, CBI offers Facilitation Support Services (FSS), and Sacramento County is the grant administrator. Sac County has taken responsibility as a GSA in those areas where no GSA was formed to avoid state intervention. EKI Consultants are providing technical support. The Cosumnes Basin is doing data refinements on the CoSANA Model and developing technical memos on the Data Management System, Hydrogeological Conceptual Model (HCM), and Monitoring Networks.

Undesirable Results

Similar to the SAB, the most concerning undesirable results in the Cosumnes Basin are reduction in groundwater storage, surface water depletion, and lowering of groundwater levels (*see figure 2 above*). Regarding water quality, there are no remediation sites in the Cosumnes. Lastly, land subsidence and seawater intrusion are of low concern.

- **Groundwater Levels and Storage:** The Hydrologic Conceptual Model (HCM) shows that groundwater elevation has declined on an average of more than 15 feet between 1999 and 2018, and there is a significant cone of depression east of City of Galt. The model estimated a total of 10,000 acre-feet decrease in groundwater storage per year.
- **Surface Water/Groundwater Interactions:** The subbasin is using DWR Guidance and the Nature Conservancy guide to evaluate GDEs. The Cosumnes has also convened a Surface Water Advisory Group (SWAG) to explore this interaction. Part of the Prop 68 Grant includes adding two stream gages along the Cosumnes River.

Answers to EC Questions:

- **Groundwater Banking:** GSAs will be identifying potential recharge areas, since there is no surface water supply in the basin and considering conjunctive use is not an option.

- *Solutions to overdraft and cone of depression:* Projects and management actions have not been considered yet.
- *Impacts of the Sacramento Regional County Sanitation District's Supply of Treated Water on overdraft?* Modeling shows supply increases in the the Cosumnes Subbasin, but actual contributions have not been calculated.

Next Steps

- The Cosumnes Subbasin is in the process of doing geophysical studies, isotope analysis, and monitoring well installation.
- Technical memos are available for public review and comments. Comments will be addressed in the GSP administrative draft by next year.

Discussion: An EC member asked why the Cosumnes Subbasin focused only on one principal aquifer. Dorn explained that EKI's work suggest there are no clear defining layers confining water in the basin.

Water Accounting Framework & Groundwater Banking– Rob Swartz

Water Accounting Framework (WAF)

SGA's WAF was created to maintain the long-term sustainable yield of the North Area Basin. It was intended to facilitate the implementation of an appropriate and equitable conjunctive use program by water purveyors. SGA focused on the central area, using a series of monitoring wells with good historic records. As part of WAF, all agencies agreed to share equal responsibility in reducing water use towards a sustainability target (95 kaf a year).

The WAF has been tracking performance against that target since 2012. Each agency has a cumulative balance. When an agency outperforms the target, it gets credit in the system. When agencies exceed sustainability targets and bring surface water into the system, that surface water is considered "exchangeable," and the agency can participate in groundwater substitution transfers. This system can become a basis to operate a regional water bank, in which agencies have to bring water into the system before they can remove it. SGMA has changed the rules of the game, and this system may change. However, the steps to follow would be to: (1) set up a sustainability target for the basin, (2) define basin needs, (3) once agencies can prove they can exceed those needs, they can explore opportunities for storage and recovery actions.

Regional Water Reliability Plan: The RWA Reliability Plan (2019) aims to identify each agency's vulnerabilities and mitigation strategies. Its objective is to guarantee a "basic level of service" for each public water supplier under all conditions. The plan looks at current and long-term demand (considering 20 years) and considered over 100 mitigation actions.

The Reliability Plan developed a conjunctive use plan, considered a series of constraints, and identified opportunities and barriers. The study showed significant opportunities: in wet years, the region had additional water available for in lieu recharge and in dry years it had enough groundwater capacity to pump additional water. New facilities could be built to expand conjunctive use, increasing the potential for storage and recovery. However, expanding conjunctive use is very expensive. One of the main recommendations that emerged from the plan was to develop of a regional water bank to: (1) generate revenue to offset expenses by storing

and recovering water from partners and allowing groundwater substitution transfers; (2) improve water supply reliability by expanding conjunctive use to strengthen drought preparedness and climate adaptation.

Regional Water Bank

One of the main recommendations that emerged from the reliability plan was to develop a regional water bank to: (1) generate revenue to offset expenses by storing and recovering water from partners and allowing groundwater substitution transfers; (2) improve water supply reliability by expanding conjunctive use to strengthen drought preparedness and climate adaptation.

Most Water Banking rules already exist. In 2019 the United States Bureau of Reclamation (USBR) updated its [Groundwater Banking Guidelines](#) associated with the Central Valley Project, which include multi-year storage, require storage before recovery, account for a loss factor (determined through modeling tools), and include monitoring and mitigation (demonstrate no third party impacts).

Dry-year transfer programs are hosted annually by the DWR and USBR. These are single year transfers, do not require storage, include a one-time loss transfer (stream-depletion factor), and also require monitoring and mitigation. Existing groundwater substitution transfers are inconsistent with SGMA, particularly related to surface-groundwater interactions.

Timing for Storage and Recovery

Determining when to store and when to recover will be done iteratively, using three modeling tools (CoSANA an integrated water resources model, CalSIM3 which simulates operations, and potentially a temperature model to take into account temperature impacts) and in consultation with the Water Forum.

Protecting Riparian Areas and Groundwater Dependent Ecosystems

Existing guidelines to protect ecosystems include having wells within one mile of the river, deeper than 150 feet to the first perforated interval. Each well needs to be within half a mile of potential GDEs and has to demonstrate that groundwater is not supporting GDEs.

Path Forward

A regional Water Bank is an institution that lays down a framework and regulations that can grow substantially over time. The Bank could grow from urban to rural areas through municipal in-lieu recharge, recycled in-lieu recharge, municipal direct recharge, flood water management, agricultural water in-lieu recharge, etc. The plan is expected to be completed in 2022 and would include technical tools, environmental impact analyses (state and federal), a new accounting framework, financial analysis, established governance, and approval structures in place. Ultimately, new facilities would be constructed to expand operations.

Discussion:

- **Perforated Intervals:** An EC asked about the purpose of perforated intervals. Perforated intervals are pipe casings with holes that allow water from the aquifer to fall into the well. By requiring solid casings in the top portion of the well, one can avoid pulling water from the shallow portion of the aquifer near the river.

- **Land Subsidence:** An EC member asked about how land subsidence and prolonged drought concerns will be accounted for in water banking operations. R. Swartz explained that subsidence is not much of a concern in this region, as long as cumulative storage remains above historically low levels.
- **Protecting the River:** Another EC member asked how agencies would determine when to take water out of the river for storage, while protecting the river. R. Swartz responded by emphasizing the role of collaboration among the caucuses to make those determinations. Regarding scale, the operations should not overwhelm the river in normal conditions. Spawning habitat and rearing habitat flows could be predefined to set out criteria for taking water out. In dry years, there could be more water brought or kept in the system.
- **Governance:** Part of establishing the Water Bank would include defining governance and establishing operating principles.
- **Accounting for critical periods for fish:** An EC member asked about the possibility for including provisions to set aside water to supplement instream flows at critical periods for fisheries, during dry years. This could tie-in with the concept of abstaining from groundwater extractions to leave water in the river at critical periods.
- **Financing:** One of the benefits highlighted from the Water Bank was to generate revenue. In response, an EC member asked about potentially including a “premium” for groundwater storage and exports outside the region. R. Swartz replied that this is a possibility that needs to be further explored with modeling tools.
- **Climate Change:** Regarding climate impacts on water resources, an EC member suggested creating a larger buffer within the basin. R. Swartz replied that long-term monitoring during GSP development will help inform future challenges and opportunities to increase resilience and potentially shoot for a more ambitious model.
- **Megadroughts:** Another EC member suggested evaluating and modeling a probable maximum drought to increase preparedness. Dendochronology (tree ring data) could help inform that analysis.
- **Growth and land-use change:** An EC member asked if they have considered evaluating future total water demand associated with maximum build-out, and how it relates to climate change modeling.

Wrap-Up and Next Steps

- CBI will prepare written summaries of each session and will share them during the September 10th plenary session. The goal is to identify the key problems to be solved and addressed during WFII negotiations.
- On August 20th, during the next NSC meeting, Amy Talbot (RWA) will present on the Regulatory Framework for Water Conservation and Urban Water Management Planning.

Meeting Participants

NSC Representatives

Environmental Caucus

- Rob Burness, Sierra Club Motherlode Chapter
- Clyde Macdonald, Save the American River Association (SARA)
- Ted Rauh, ECOS
- Ron Stork, Friends of the River (FOR)

- Barbara Leary, Sierra Club Motherlode Chapter
- Melinda Frost-Hurzel, ECOS (Alternate)
- Barbara Evoy, ECOS (Alternate)

Water Caucus

- Jim Peifer, Regional Water Authority (RWA)
- Tony Firenzi, Placer County Water Agency
- Paul Schubert, Golden State Water Company
- Greg Zlotnick, San Juan Water District
- Paul Helliker, San Juan Water District (Alternate)
- Darin Reintjes, Placer County Water Agency (Alternate)
- Sean Bigley, City of Roseville (Alternate)

Public Caucus

- Bill Busath, City of Sacramento
- Ansel Lundberg, SMUD
- Kerry Schmitz, Sacramento County
- Anne Sanger, City of Sacramento (Alternate)

Water Forum Staff, Consultants & Facilitators

- Tom Gohring, Water Forum
- Lilly Allen, Water Forum
- Chris Hammersmark, CBEC
- Bennett Brooks, Consensus Building Institute (CBI)
- Tania Carlone, CBI
- Mariana Rivera-Torres, CBI

Other Participants

- Andrew Fecko, PCWA
- Betsy Weiland, ECOS
- Brett Ewart, COS
- Brian Poulsen
- Cathy Lee, Carmichael Water
- Chelsea Spier
- Chris N
- Craig Locke
- Dan York, SSWD
- Esthan Vijay
- Greg Kamman, CBEC
- I-Pei Hsiu, EBMUD*
- Linda Dorn, Sacramento County
- Mike Grinstead, SCWA
- Mike Huot, SSWD
- Noelle Mattock
- Paul Olmstead
- Roy Leidy, CWD
- Trevor Joseph, City of Roseville

**Water Forum II
August 20, 2020**

Foundational Briefing #4: California's New Era of Water Efficiency

Meeting-At-A-Glance:

- Amy Talbot from the Regional Water Authority presented the fourth “foundational briefing,” as part of the Water Forum II Negotiating Steering Committee (NSC). This session, open to the public, aimed to establish a shared foundational understanding about climate change to inform the future Water Forum II Agreement.
- Water Forum members had the opportunity to ask clarifying questions and request additional data.

BACKGROUND

The Water Forum convened meeting #5 of the Negotiating Steering Committee (NSC) on August 20, 2020. The meeting was divided into two parts: 1) the fourth foundational briefing for the broader Plenary and interested parties on *California's New Era of Water Efficiency* by Amy Talbot, Regional Water Authority (RWA); and, 2) a regular monthly meeting of the NSC. The meeting, conducted via webinar as a result of Covid-19 restrictions on in-person meetings, was attended by 12 NSC representatives and 7 alternates from the water, environmental and public caucuses in addition to Water Forum staff and approximately 6 observers. The Consensus Building Institute (CBI) facilitated the meeting. A list of meeting participants is attached.

DISCUSSION – KEY THEMES

Below is a summary of key themes and next steps discussed for Part I (only) of the meeting. This summary is not intended to be a meeting transcript. Rather, it focuses on the main points covered during the presentation and group discussions.

Welcome, Introductions and Agenda Review

The meeting began with a brief welcome from CBI Senior Mediator Bennett Brooks, as well as a review of the agenda and ground rules. Tom Gohring, WF Executive Director, welcomed participants explaining that the purpose of the foundational briefings is to provide an opportunity for WF members to have a common understanding of foundational topics likely to inform multiple aspects of the WFII negotiations. A series of presentations comprise the learning phase of the effort. T. Gohring informed participants that staff and facilitators will prepare a synthesis paper discussing the problems, opportunities and intentions that will inform discussions for the Water Forum II (WFII) Agreement. The intent is to present a draft document at the Water Forum Plenary on September 10th.

PART I – FOUNDATIONAL BRIEFING PRESENTATION

Presentation: California's New Era of Water Efficiency, Amy Talbot, Regional Water Authority (RWA)
A. Talbot gave an overview of the presentation, noting that she would discuss: the past, present and future of water efficiency in California, specifically focusing on a brief overview of the past (2009) legislation (20 x 2020), a discussion of the new laws, and the current status of water conservation and urban water management planning in the region.

20x2020 (Senate Bill (SB) [X7-7](#))

A.Talbot explained that SB x7-7, known as 20x2020, passed in 2009, established a statewide goal for 20% reduction in urban water use. The flexibility of how water suppliers achieve that goal was viewed as positive. However, some thought it was an unfair approach because it was based solely on percentage of Gallons Per Customer Per Day (GPCPD) and no credit was given for previous water conservation efforts. The compliance deadline is December 31, 2020. The 2020 Urban Water Management Plans (UWMPs) are required to demonstrate 20x2020 compliance and are due to the State on July 1, 2021. The vast majority of regional water agencies are under 20x2020 targets and all agencies are anticipated to meet compliance.

GPCPD & Residential GPCPD

There has been a steady decline over time in GPCPD while water use has remained fairly steady and population has increased. GPCPD includes all sectors of water use while Residential GPCPD (RGPCPD) is a representation of the residential water use sector only. RGPCPD provides a clearer sense of each person's water use. RGPCPD is lower than GPCPD. RGPCPD is not a simple number because water use patterns are variable over time as a result of precipitation trends in California. Water use is largely driven by external factors, such as precipitation and temperature. It is also important to note that GPCPD is not the same for every community.

New Laws, New Era of Water Conservation

There are two interrelated laws [SB 606 and Assembly Bill \(AB\) 1668](#) for water conservation and drought planning which were passed in May 2018 and will be instituted after 20x2020. The new laws are based on Governor Brown's Executive Order (EO) B-37-16 which was issued in 2016 during the last drought. The EO identified four primary goals: 1) Use water more wisely; 2) eliminate water waste; 3) strengthen local drought resilience; 4) improve agricultural water use efficiency and drought planning. The new water conservation and drought planning laws focus on goals 1 and 3 of the EO. The target audience of the new laws is urban retail water suppliers that directly provide potable municipal water to more than 3,000 end users or that supply more than 3,000 acre-feet of potable water annually, such as the City of Sacramento and Sacramento Suburban Water District. The target audience is the water supplier not individual people and households.

Terminology

A.Talbot clarified some terminology pertaining to the new legislation to inform the discussion. **Standard:** refers to the method used to calculate volumetric estimates of the objective (example: 55 gallons x population) and **objective** refers to the estimate of water use calculated from the standards for each urban water supplier which equates to the water use budget or targets (example: 555 million gallons).

Standards for Calculating Water Targets

A.Talbot gave an overview of the standards for calculating water budgets and walked through an example illustrating a stepwise process of how it would work. Each water supplier creates a unique target by adding together standards for: 1) indoor water use (55 GPCPD x by the population with the service area; GPCPD will reduce to 52.5 after 2025 and 50 after 2030); 2) outdoor use (yet to be determined but will be based upon a community's climate and amount of "irrigable" landscape area); 3) water loss (standard for water loss due to leaks in water system is yet to be determined; SB555 requires annual validated water loss audit reports submitted to DWR); 4) Commercial, Industrial, and Institutional (CII) landscape (standard for outdoor use for accounts with dedicated irrigation meters is yet to be determined; anticipated to be similar to residential outdoor water use standard).

Indoor water-use for CII sector, while not yet established, will not be volumetric but performance-based since it is difficult to assess business water budgets because of a variable and diverse set of circumstances.

A.Talbot also indicated that DWR will allow for variances for unique water uses. She concluded by explaining that each water supplier does not need to meet each target within each standard as long as they meet the overall water budget.

Water Use Efficiency Standards Timeline for Development

A.Talbot gave an overview of the timeline for development and implementation of the new water-use efficiency standards. Development of the standards began in 2018 and is still under development. Water suppliers are required to adopt standards in 2022, calculate objectives in 2023, and meet targets by 2026. State Water Resources Control Board (State Board) enforcement actions begin in November 2023. Water suppliers that fail to comply with State Board orders may be subject to fines of up to \$1,000/day.

Urban Water Management Plans (UWMPs)

Urban water suppliers are required to prepare UWMPs every 5 years. The next UWMPs are due in 2020. UWMPs assess water reliability over a 20-year planning timeframe. They describe water demand measures and water shortage contingency plans. They report progress in meeting 20x2020 goals and discuss the use and planned use of recycled water. It's a high-level planning document that is not intended to be a water supplier master plan, capital improvement plan, or water conservation/efficiency plan.

In light of new regulations, urban water suppliers are being asked to do more in UWMPs, including: 1) conducting drought risk assessments that increases the duration of drought severity from 3 to 5 years; 2) using standard water shortage contingency plan stages that allow urban water suppliers to institute actions to get to the required percent water use reduction for each stage (see below table); 3) including a discussion of climate change and water energy although guidance has yet to be released by DWR. One Water Caucus (WC) member clarified that water suppliers are not required to use the new stages but may use their own as long as they can be adapted to the new template.

Water Contingency Plan Stages	Required Percent Water Use Reduction
Stage 1	10%
Stage 2	20%
Stage 3	30%
Stage 4	40%
Stage 5	50%
Stage 6	>50%

The new regulations also require enhanced reporting which applies to both wholesale and retail water suppliers. The reporting regulations were adopted in 2020 and require: 1) monthly reporting on production and conservation metrics; 2) an annual water shortage assessment beginning in 2022; 3) annual water use objectives required every November 1st beginning in 2023.

Where We Are Now: Progressing and Planning

State Activities

The State is conducting:

- a statewide study to investigate if the current indoor standard is appropriate;
- ongoing pilot studies and analyses to refine landscape budget approach in partnership with Eagle Aerial for outdoor standard;
- a formal rulemaking process beginning in September 2020 for the water loss standard;
- ongoing working group meetings and public comment periods.

Regional Water Authority (RWA) Activities

A.Talbot presented RWA activities related to the new regulations. RWA received \$100,000 in grant funding to study indoor water use and fixture saturation to assess the level of opportunity for fixture replacement in the region. RWA is currently working with Land IQ and 5 water suppliers on a Landscape Budget Pilot project for the outdoor water use standard. RWA is also partnering with UC Davis to study various irrigation efficiency approaches. RWA also holds leadership roles on the ACA NV AWWA Water Loss Committee, serves as the ACWA Water Loss Lead, and attends State Board member meetings with RWA member agencies pertaining to the water loss standard.

RWA Regional Water Efficiency Program

A.Talbot gave an overview of the RWA's regional water efficiency program. The program has been ongoing for two decades involving 19 suppliers within the region and has an annual budget of \$580,000. It is principally a public outreach campaign which also includes school education and professional landscape trainings. The primary messages of the campaign are:

- Using water efficiently is important no matter the weather
- Efficient watering grows healthy plants
- Most water use occurs outdoors and, therefore, the best way to know if your yard needs water is to check the soil moisture level using a meter or by digging down. This message was tested in one of the RWA's many focus groups.

A.Talbot concluded by suggesting that the public outreach and ad campaign can be an effective tool in communicating key messages, calls to actions and the primary challenges the region faces with water-use efficiency and demand management which can help impact individual water user water conservation efforts.

Challenges

A.Talbot wrapped up the presentation by discussing some of the challenges associated with implementation of the new regulations. There are still many unknowns at this time related to the development of the standards that will be used. It is anticipated that implementation of these regulations will require increased staff and budgets for water suppliers. There's also some uncertainty about the State's capacity and approach to enforcement of the regulations. There is an ongoing question about whether there will be significant resources committed to implement these regulations only to discover that California is already relatively efficient. If that's the case, it's not clear what the State would do then. There are also changing water trends. In the past, fixture replacement has been the focus which is a more passive approach. Moving forward, a more active approach needs to be taken given that the more passive approaches have been mostly exhausted. There are going to be climate change impacts. Also, water agencies are working with layers of regulations which forces agencies to prioritize.

She explained that the new regulations are likely to increase water efficiency awareness throughout the state. It will likely motivate agencies to reevaluate their efficiency goals and programs, and will strengthen and foster new partnerships among state, regional and local partners. It will also improve drought planning, all of which are good outcomes. However, there is a question about whether the level of effort required to implement these complex regulations will justify the savings or benefits that are realized which also brings into question whether the cost/benefit ratio will be cost effective for agencies. Water efficiency is important but it's not everything and is part of holistic water management. She concluded by suggesting that the devil's in the details and it remains to be seen how the new regulations will be implemented and the ultimate effectiveness of the approach.

Discussion:

- J. Peifer expressed that RWA is currently working with several member agencies on ground truthing outdoor landscaping water use data. Each supplier will be able to apply the data to their

individual water use efficiency programs and the effort increases the region's readiness to be more responsive to the new regulations.

- One member of the Environmental Caucus (EC) offered that the State is looking at what water agencies are doing but at some point it will be important to look at individual water consumers. A. Talbot clarified that the State leaves choices related to individual water consumers, such as irrigation use and planting choices to local planning departments and local authorities/ordinances, for example.
- Another EC member acknowledged that it's challenging to educate the public on these topics and pointed out a tension between the desire to create more green spaces and decrease heat islands but then telling people to use less water. The result, especially during drought conditions, is the loss of trees. A. Talbot agreed that it is challenging. That is why RWA has focused on the message of delivering the right amount of water to maintain healthy landscapes. She highlighted that outdoor water use is going to be the focus of RWA's water use efficiency programming. She continued that the loss of trees is what prompted RWA to partner with the Sacramento Tree Foundation to engage in joint outreach and communications.
- An EC member asked how many water suppliers in the region are required to comply with the new regulations. A. Talbot clarified that all but two RWA members are subject to the new water use efficiency laws and there are two large water suppliers, the City of Galt and Rio Linda Elverta Water District, that are not RWA members.
- An EC member expressed a desire for greater standardization, where possible, among the UWMPs across the region to aid the public in accessing comparable information that could provide a clearer regional perspective and relatability among RWA members. A. Talbot noted that there are some standard tables within UWMPs that could be used as a basis for comparison. J. Peifer mentioned that there has been a recognition among some RWA members that they would benefit from some shared UWMP chapters to help streamline the process. Another WC member offered that the American River Basin Integrated Regional Water Management Plan (IRWMP) has a good table that shows the water supply sources for Sacramento region agencies. One WC member noted that it would be challenging to standardize the water supply components of UWMPs since each agency's water rights are uniquely described. However, the water demand side is very standardized which aids in an "apples to apples" comparison.
- A Public Caucus (PC) member asked if the State's economic model accounts for water affordability? A. Talbot explained that SB555 language refers to "full cycle cost accounting" which focuses on determining a cost/benefit ratio and cost effectiveness from an agency perspective. However, it stops short of analyzing the possible impacts on water rates.
- An EC member suggested that the information in the presentation seems to argue that the state's approach to dropping from 55-50 GPCPD by 2030 may not be that severe a standard for the Sacramento region. The information presented suggests we may be able to do better in this region.
- On another point, the commenter specified that in an earlier conversation, it was stated that local planning agencies are directed towards UWMPs to use as a basis to make land-use decisions related to growth and the water nexus. However, if plans are not aggressively accounting for climate change, water demand, and water supply, then local planners are not going to be able to answer those questions effectively. A. Talbot responded that planners use a range of available resources not just UWMPs to make good planning decisions. However, it would be beneficial for land-use planners and water managers to be working more closely together.
- A WC member asked for clarification from EC members checking if it is their perspective that the new regulations are fine as a state standard but may not go far enough for the Sacramento Region, asking if that means we should be willing to discuss possibly doing more and that we should have that conversation within the WFII process. An EC member responded that there appears to be room for better coordination and consistency among agencies in the region and that

it's an open question whether going beyond the regulations would be appropriate. The facilitator noted that there may be a diversity of opinions on this topic and it would benefit from further exploration. He suggested that revisiting the respective caucus statements of interests on this topic may offer a good starting point for continuing the conversation.

- B. Brooks thanked A. Talbot for a comprehensive and informative presentation and adjourned to a brief break.

Meeting Participants

NSC Representatives

Environmental Caucus

- Rob Burness, Sierra Club Motherlode Chapter
- Clyde Macdonald, Save the American River Association (SARA)
- Ted Rauh, ECOS
- Ron Stork, Friends of the River (FOR)
- Barbara Leary, Sierra Club Motherlode Chapter
- Allan James, Habitat Work Group (Alternate)
- Melinda Frost-Hurzel, ECOS (Alternate)
- Barbara Evoy, ECOS (Alternate)

Water Caucus

- Jim Peifer, Regional Water Authority (RWA)
- Dan York, Sacramento Suburban Water District
- Tony Firenzi, Placer County Water Agency
- Paul Schubert, Golden State Water Company
- Greg Zlotnick, San Juan Water District
- Marcus Yasutake, City of Folsom (Alternate)
- Paul Helliker, San Juan Water District (Alternate)
- Sean Bigley, City of Roseville (Alternate)

Public Caucus

- Ansel Lundberg, SMUD
- Kerry Schmitz, Sacramento County
- Anne Sanger, City of Sacramento (Alternate)

Water Forum Staff, Consultants & Facilitators

- Tom Gohring, Water Forum
- Bennett Brooks, Consensus Building Institute (CBI)
- Tania Carlone, CBI
- Mariana Rivera-Torres, CBI

Other Participants

- Amy Talbot, RWA
- Jim Ray, Building Industry Association
- Gerald Schwartz, EBMUD
- I-Pei Hsiu, EBMUD
- Le Johnson
- Craig Locke

November 19, 2020

Foundational Briefing #5. Forest Health

B. Brooks resumed the meeting and introduced Forest Health foundational briefing presenters: Darin Reintjes, PCWA; Martha Conklin, UC Merced; and Nic Enstice, Sierra Nevada Conservancy. B. Brooks described the purpose of the briefing as an opportunity for Water Forum members to have common understanding of topics likely to inform aspects of the WFII negotiation. He specifically noted the focus of the forest health briefing on the linkage between upstream forest health and Water Forum goals.

Presentation Overview

Darin Reintjes introduced the presentation, “Healthy Forests for All: The importance of Watershed Health on Regional Water Supply Reliability.” He noted that the presentation would include an overview of the American River headwaters, consequences of climate change and past forest management practices, recent fire history and impacts, benefits of forest management, and costs and funding considerations.

American River Headwaters

D. Reintjes highlighted that the headwaters:

- Provide high quality water supply to more than 200k people and agriculture in 3 counties
- Produce hydropower generation for 700k homes
- Offer majestic landscapes, scenic beauty and recreation as well as biodiverse aquatic and terrestrial ecosystems, and more.

Consequences of Climate Change and Past Forest Management

D. Reintjes described the consequences of climate change and past forest management practices as depicted below. The pressure of a warming climate, overcrowded, dense forests and drought have created conditions that have diminished forest health. These conditions have contributed to fire prone forests that have had significant, negative impacts on air quality, communities, infrastructure, water quality, and the ecosystem, including unprecedented tree mortality as a result of drought conditions and bark beetle infestation.



Recent Fire History

2020 nearly doubled past records in the number of acres burned. This year more than 4.2 million acres have burned in the state and 5 of the 6 largest fires in California history occurred in 2020. In 2014, the King Fire burned 97,717 acres in the South Fork American, Rubicon, and Middle Fork American River Watersheds. At the time, its size and fire severity seemed outside the norm. However, recent fires have demonstrated that large, high severity fires have become a regular occurrence as illustrated below.

Top 20 Largest California Wildfires

<i>FIRE NAME (CAUSE)</i>	<i>DATE</i>	<i>COUNTY</i>	<i>ACRES</i>	<i>STRUCTURES</i>	<i>DEATHS</i>
1 AUGUST COMPLEX (<i>Under Investigation</i>)*	August 2020	Mendocino, Humboldt, Trinity, Tehama, Glenn, Lake, & Colusa	1,032,649	935	1
2 MENDOCINO COMPLEX (<i>Under Investigation</i>)	July 2018	Colusa, Lake, Mendocino & Glenn	459,123	280	1
3 SCU LIGHTNING COMPLEX (<i>Under Investigation</i>)*	August 2020	Stanislaus, Santa Clara, Alameda, Contra Costa, & San Joaquin	396,624	222	0
4 CREEK FIRE (<i>Under Investigation</i>)*	September 2020	Fresno & Madera	377,693	853	0
5 LNU LIGHTNING COMPLEX (<i>Under Investigation</i>)*	August 2020	Sonoma, Lake, Napa, Yolo & Solano	363,220	1,491	6
6 NORTH COMPLEX (<i>Under Investigation</i>)*	August 2020	Butte, Plumas & Yuba	318,930	2,352	15
7 THOMAS (<i>Powerlines</i>)	December 2017	Ventura & Santa Barbara	281,893	1,063	2
8 CEDAR (<i>Human Related</i>)	October 2003	San Diego	273,246	2,820	15
9 RUSH (<i>Lightning</i>)	August 2012	Lassen	271,911 CA / 43,666 NV	0	0
10 RIM (<i>Human Related</i>)	August 2013	Tuolumne	257,314	112	0
11 ZACA (<i>Human Related</i>)	July 2007	Santa Barbara	240,207	1	0
12 CARR (<i>Human Related</i>)	July 2018	Shasta County & Trinity	229,651	1,614	8
13 MATHILJA (<i>Undetermined</i>)	September 1932	Ventura	220,000	0	0
14 WITCH (<i>Powerlines</i>)	October 2007	San Diego	197,990	1,650	2
15 KLAMATH THEATER COMPLEX (<i>Lightning</i>)	June 2008	Siskiyou	192,038	0	2
16 MARBLE CONE (<i>Lightning</i>)	July 1977	Monterey	177,866	0	0
17 LAGUNA (<i>Powerlines</i>)	September 1970	San Diego	175,425	382	5
18 SQF COMPLEX (<i>Lightning</i>)	August 2020	Tulare	170,384	228	0
19 BASIN COMPLEX (<i>Lightning</i>)	June 2008	Monterey	162,818	58	0
20 DAY FIRE (<i>Human Related</i>)	September 2006	Ventura	162,702	11	0

There is no doubt that there were fires with significant acreage burned in years prior to 1932, but those records are less reliable, and this list is meant to give an overview of the large fires in more recent times.
 This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.
 *Numbers not final.

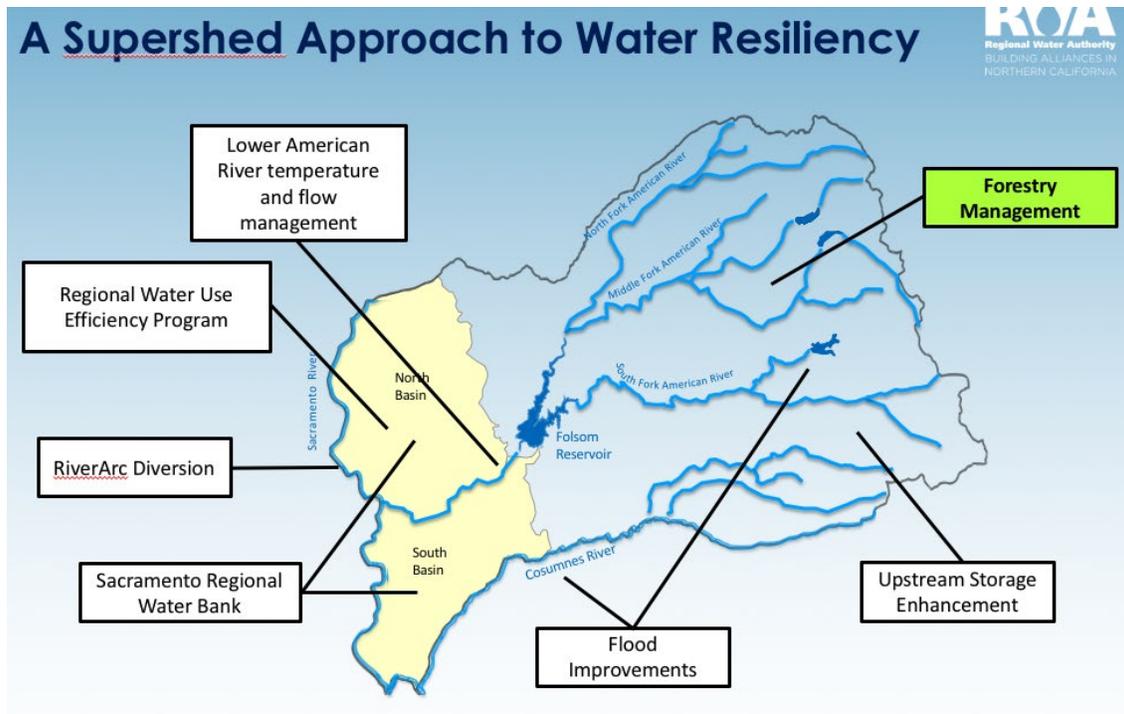


11/3/2020

High severity fires, like the King Fire, even destroy soil and seed stocks. In addition to air quality impacts, they exacerbate sediment impacts to the river and infrastructure. The King Fire required significant removal of sediment that had negatively impacted PCWA’s infrastructure as well as aquatic ecosystems. The effects were felt in the lower watershed down to Folsom Dam and beyond.

A Supershed Approach to Water Resiliency

D. Reintjes highlighted the Regional Water Authority (RWA) approach, which is aiming to take a holistic approach to the entire watershed. The American River Basin Study is looking into a portfolio of strategies and projects. The approach no longer considers water supply management to be limited to within the boundaries where water is consumed. Adaptations include forest management, surface storage and flow management, water use efficiency, relocating places of diversion to a less sensitive river reach, and water banking. These adaptations are shown to improve reliability for consumptive needs and for environmental conditions, specifically, temperatures in the lower American River. These are not independent projects; rather, they will be considered as a whole, branded the “Supershed.”



There is a need to create “resilient landscapes to protect the water, carbon storage, wood products, habitat, and recreation values that our Sierra Nevada Forests provide”
 Jim Branham, Executive Officer for the Sierra Nevada Conservancy

Benefits of Headwater Forest Management

D. Reintjes emphasized that an ecologically managed forest versus a fire-suppressed forest promotes surface fire, not crown fires, which can improve forest health. He concluded by summarizing the benefits of headwater forest management:

- Support the well-being of rural communities
- Reduce smoke impacts
- Store carbon and reduce emissions
- Protect water quality
- Increase water supply

Economic Drivers of Sustainable Forest Management Matter for California’s Headwaters

Martha Conklin, UC Merced, gave an overview of the key economic drivers of sustainable forest management including: finding a multi-benefit pathway to a wicked problem; engaging partnerships in a holistic approach to forest management; applying the best available science and managing adaptively; and, communicating effectively to engage support from broad group of beneficiaries.

Multi-benefits

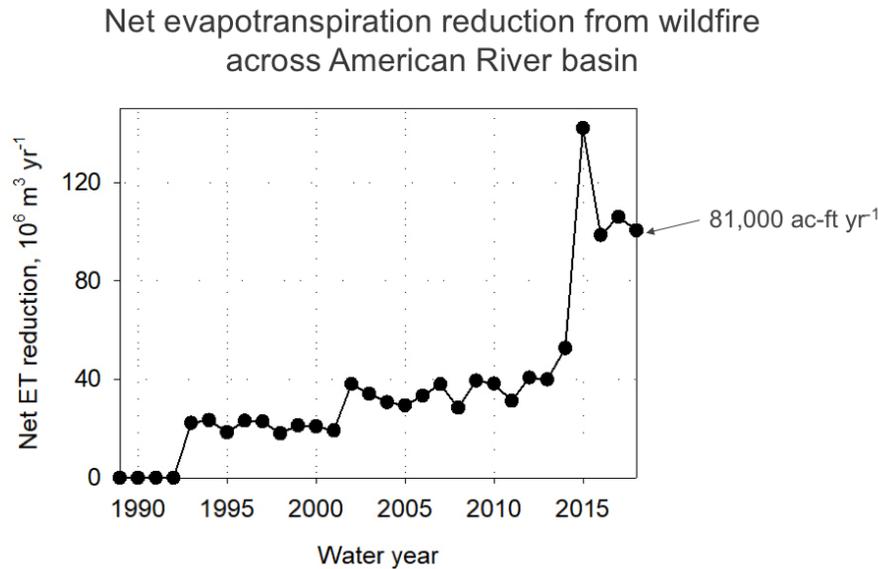
Forest restoration provides benefits in addition to reducing the probability of high severity wildfires and direct damage from fires and smoke. Forest thinning reduces tree mortality and stores carbon in trees and soil which contributes to ecological integrity and resilience. Removing trees also reduces water use in forests, making more water available for remaining trees, in-stream flows and water supply for agriculture and urban areas. Also, sustainable forest management reduces erosion and built infrastructure. Finally, removal of smaller trees can be a source of biofuel, which allows a community to generate biomass jobs and equity for communities.

Partnerships

Partners facilitate planning, permitting, financial implementation, monitoring, research, communication, and public support.

Science & Adaptive Management

Monitoring & research are part of the adaptive-management cycle. It’s important to get ground data and start predicting water/carbon balance, and to monitor forest health.



Hypothesis: active forest management to control fuel loads & maintain forest health could yield an average of 5 times this amount in the American River basin

Communication

M. Conklin concluded her presentation by focusing on the importance of communication. She emphasized the need to develop an educated public to engage support across all who benefit, from local to statewide audiences. Climate change is a national problem and forest health offers multiple benefits to many.

Take Action: Sierra Nevada Watershed Improvement Program (TCSI & WIP)

Nic Enstice, Sierra Nevada Conservancy, described how collaborative partnerships are coming together throughout California to address these challenges, with the Sierra Nevada Conservancy and U.S. Department of Agriculture leading the way. Together, these agencies launched the Sierra Nevada Watershed Improvement Program (WIP), a large-scale restoration program designed to increase the pace and scale of forestry restoration efforts in California’s primary watersheds and create resilient Sierra Nevada communities. Recognized in state policy and planning documents as a model for addressing the growing challenges facing the Sierra Nevada region in a changing climate, Sacramento-area water providers are now putting the program to work in the region’s headwater forests. The Tahoe-Central Sierra Initiative (TCSI) is the first pilot project under the Sierra Nevada Watershed Improvement Program (WIP). The TCSI aims to accelerate large-landscape forest restoration to improve the health and resilience of the Sierra Nevada. It focuses on developing and demonstrating innovative planning, investment, and management tools across a 2.4-million-acre landscape. The TCSI is led by state, federal, nonprofit, and private partners, and responds to state and federal mandates that call for increasing pace and scale of forest management and restoration and better protection of communities from wildfire.

N. Enstice described two collaborative projects. The Caples Ecological Restoration and French Meadows projects. Caples Creek is a major tributary watershed to the South Fork American River. The purpose of the project is to reintroduce fire back to the landscape. Project partners include: USFS, EID, SNC, Sierra Forest Legacy, SOFAR Cohesive Strategy, Amador-Calaveras Consensus Group, Pacific Southwest Research Station, CA Academy of Sciences. The French Meadows project was developed as a public-private partnership between by Placer County Water Agency, Placer County, The Nature Conservancy, American River Conservancy, Sierra Nevada Conservancy, University of California Merced, and U.S. Forest Service. The 28,000-acre project uses prescribed burns and mechanical thinning to clear underbrush, thin smaller trees, clear biomass for use as renewable energy, and restore forests and meadows.

Mokelumne Avoided Cost Study

N. Enstice described the **primary goals** of the avoided cost study which were to:

- Calculate avoided costs of implementing forest treatments vs. current conditions
- Identify treatments and locations that maximize benefits
- Increase pace and scale of forest treatments through new investment sources
- Use modeling to forecast future events

He described the **key findings** of the study:

- Fuel treatments can significantly reduce the size and intensity of wildfires
- The economic benefits of fuel treatments can be three or more times the costs
- There are many beneficiaries from increased fuel treatments, especially taxpayers
- The estimated volume of sediment from post-fire is estimated to be large, however the avoided costs to downstream utilities were less than anticipated

Conclusions

D. Reintjes wrapped up the presentation by offering the following conclusions:

- Our water supplies depend on healthy headwater forests
- Ecological forest management plays a critical role on watershed health
- Without action conditions will get worse
- Need champions and partnerships to save our watershed

Meeting Participants

NSC Representatives

Business Caucus

- Jim Ray, North State Building Industry Association

Environmental Caucus

- Ted Rauh, ECOS
- Barbara Leary, Sierra Club Motherlode Chapter
- Clyde Macdonald, SARA
- Ron Stork, Friends of the River (FOR)
- Rob Burness, Sierra Club
- Chris Brown, Sacramento Climate Coalition (Alternate)
- Barbara Evoy, ECOS (Alternate)
- Melinda Frost-Hurtzel, Cosumnes Coalition (Alternate)
- Allan James, SARA (Alternate)

Public Caucus

- Bill Busath, City of Sacramento
- Ansel Lundberg, SMUD
- Kerry Schmitz, Sacramento County Water Agency (SCWA)
- Mike Grinstead, SCWA (Alternate)
- Anne Sanger, City of Sacramento (Alternate)

Water Caucus

- Dan York, Sacramento Suburban Water District
- Paul Schubert, Golden State Water Company
- Jim Peifer, Regional Water Authority (RWA)
- Tony Firenzi, Placer County Water Agency (PCWA)
- Greg Zlotnick, San Juan Water District
- Paul Helliker, San Juan Water District (Alternate)
- Sean Bigley, City of Roseville (Alternate)
- Darin Reintjes, PCWA (Alternate), presenter
- Marcus Yasutake, City of Folsom (Alternate)

Water Forum Staff, Consultants & Facilitators

- Tom Gohring, Water Forum
- Bennett Brooks, Consensus Building Institute (CBI)
- Tania Carlone, CBI
- Mariana Rivera-Torres, CBI

Observers

- Nic Enstice, Sierra Nevada Conservancy, presenter
- Martha Conklin, UC Merced, presenter
- Dave Defanti, Placer County
- Levi Johnson
- Marie Davis, PCWA
- Gerald Schwartz, EBMUD

Foundational Briefing #6. Flow Management Standard

Water Forum II

Meeting Summary: December 17, 2020, Negotiating Steering Committee

Meeting-At-A-Glance:

- Participants received an overview presentation on the Flow Management Standard and discussed the potential implications for the Water Forum II (WFII) process.

Presentation [[Access Here](#)]: Flow Management Standard (FMS)

T.Gohring started his presentation providing the rationale for discussing the FMS with the NSC now. He emphasized the need to think about how the FMS and Modified FMS (MFMS) would be implemented adaptively on an ongoing basis. He underscored the essential importance of not allowing the WF's previous investments in the FMS to be stranded. In terms of its relevance to WFII, he noted that the ongoing implementation of the FMS will require funding. Adaptive management also requires an investment in science through the Habitat Management Element (HME). Other relevant questions related to the FMS include how the WF will engage with the Voluntary Agreement (VA) process and the Water Quality Control Plan, and more broadly how the WF wishes to engage with the State Water Resources Control Board (State Board) related to FMS implementation. T. Gohring noted that when he began his tenure 14 years ago, WF members emphasized the importance of focusing on getting the FMS done.

Discussion. Jim Peifer explained that initially the FMS was seen as “a get” for the environment. But, he noted, the FMS is good for water suppliers, too. The whole package reduces risk to everyone. The Coordinating Committee has asked T. Gohring to plant the FMS into every regulatory process. It may be the most important thing the WF has done. Ron Stork asserted that the WF is a long way from an FMS agreement with the Bureau of Reclamation (Reclamation). Right now, the WF is working with Reclamation to fashion a 3-year agreement and WF has been doing its best in a tough situation. Jim Ray agreed with J. Peifer that the FMS has been foundational to the WF. Ted Rauh agreed with others that the FMS has been foundational and that it was heartening to hear agreement around the table about its importance.

Setting. Water temperature is an issue on the LAR, as higher temperatures stress fish and can be lethal or lead to salmonid mortality over time. Flow is related to temperature where releases of cold water are used to reduce water temperature as well as physical management strategies to cool the river downstream of Folsom dam. There's also a balancing act between the needs of Chinook salmon and steelhead when managing the utilization of the cold-water pool at Folsom Reservoir.

FMS Timeline. In 2009, Reclamation voluntarily implemented the 2006 FMS. In 2013, the National Marine Fisheries Service (NMFS) Biological Opinion (BiOP) made the FMS a regulatory requirement and called for better temperature management on the LAR. During the drought in 2014-2015, Folsom reservoir got very close to dead pool. In 2014-2015, the WF membership unanimously supported the development of a Modified Flow Management Standard (MFMS) using a carryover storage approach.

Overlapping Local Objectives. Water users are interested in water supply reliability. The carryover storage component helped with that as well as water temperature. MFMS created an overlap in interests. WF started looking at storage because the 2013-2015 drought “freaked out” the region. Folsom came within a

few thousand acre-feet of dead pool (90,000 acre-feet (TAF)) for storage in Folsom. If not for a couple of key storms, dead pool seemed imminent. It also appeared that Folsom had been exercised more aggressively since the 1990s. Storage is of essential importance for water suppliers, particularly Folsom, Roseville, Granite Bay, and San Juan Water District whose primary water supply is the Municipal & Industrial (M&I) intake at Folsom dam. If Folsom reservoir gets below 90 TAF, the intake draws in only air. Things get serious below 200 TAF, where those communities reliant on the M&I intake cannot get the amount of water they need.

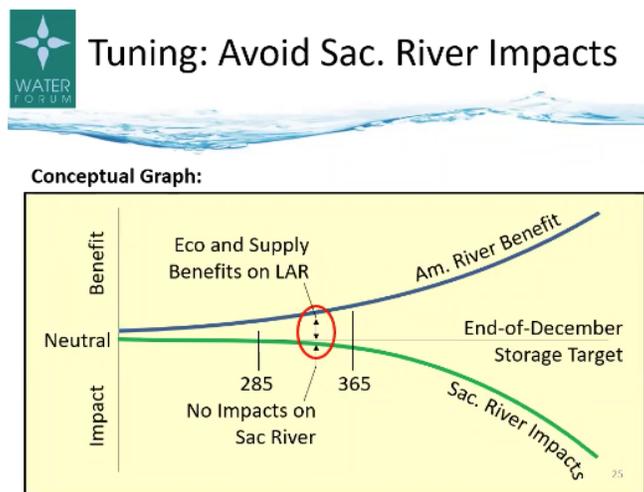
Three Primary Objectives of the MFMS

1. Make river conditions better
2. Avoid Folsom dead pool (using worst drought period in the models--1977 levels).
3. Cause no harm to the Sacramento River

MFMS Performance.

The MFMS: avoids low storage levels in Folsom Reservoir, lowers LAR water temperatures, maintains fall-run Chinook spawning habitat, avoids very low flows (below 500cfs), has no demonstrable impacts on Sacramento River fisheries, and has very low impacts to water exports.

Specifically, the “no harm” to the Sacramento River objective was achieved by something the WF referred to as “tuning.” Folsom and Shasta reservoir operations are a teeter totter. If Folsom storage is protected, to some extent it draws water from Shasta. If too much water is drawn, it endangers the ability to exercise the Shasta cold-water pool to protect fisheries on the Sacramento River. In tuning, the WF modeling effort found a “sweet spot” of 300 TAF for end of December storage that made improvements on the LAR without impacting the Sacramento River as illustrated in the following figure.

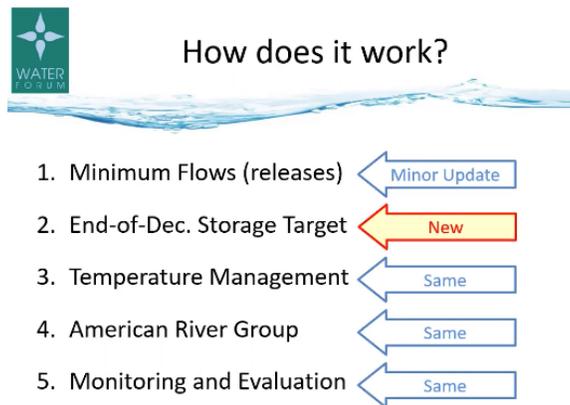


T. Gohring underscored that the MFMS made a significant improvement over the 2006 FMS. R. Stork noted the MFMS does not optimize conditions for fisheries on the LAR. Conditions are unfavorable to lethal many years even with the MFMS. He agreed with T. Gohring that the MFMS represents what is currently attainable with the “dials” available, but there may be other dials or strategies to explore and exercise (Facilitator’s Note: refer this “strategies” discussion to the FMS working group, when formed).

Unimpaired Flows and the Delta. On a block of water basis, the LAR often reaches 46% unimpaired flows or higher February through June. A scientific basis report completed two years ago by the State Board

called for unimpaired flows between 45-65% outflow to the Delta. The LAR tends to be in the range of acceptability. However, from just an American River perspective, the unimpaired flow approach creates harm from a temperature standpoint. If unimpaired flows are forced every month in the spring, so much storage is used from Folsom that it blows the cold-water pool. WF has pointed out to State Board staff that the MFMS is environmentally superior for the LAR. Then there is the question about how this basin contributes its fair share to the Delta. This is the connection between the MFMS and the Voluntary Agreement and Water Quality Control Plan. The key question becomes: **How does this basin provide a contribution to the Delta and maintain suitable water temperature for the American?**

How the MFMS works. The MFMS is similar to the 2006 FMS. It represents a minor change to the approach to minimum flows. End of December storage target is new. Otherwise, the other elements are the same as the old FMS.



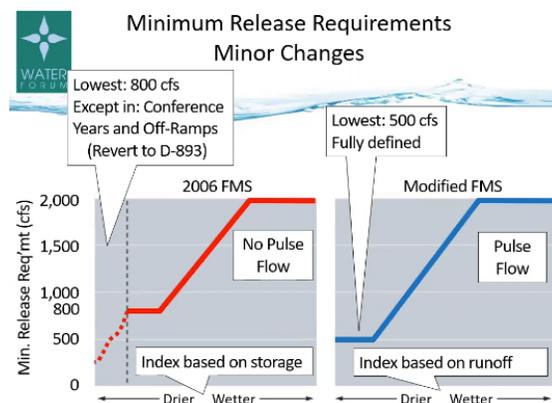
The FMS is designed to support the following biological objectives shown in the below table on a seasonal basis.

Minimum Release Requirements
Season-Specific Biological Objectives

Oct-Dec	Jan-Feb	Mar-May	Jun-Sep
Optimize Chinook Spawning Habitat	Provide Suitable Steelhead Spawning Habitat	Provide Suitable Steelhead Spawning Habitat	Manage Temperatures
-	-	-	-
Reduce Chinook Redd Superimposition	Minimize Redd Dewatering	Minimize Steelhead Redd Dewatering	Manage Habitat
-	-	-	-
Manage Temperatures	-	Minimize Juvenile Stranding	-
-	-	Preserve Coldwater Pool	-

Minimum Release Requirements. Minimum flows are designed to provide as much spawning habitat as possible given the available water in the watershed in any given year. Optimal spawning habitat is 2,000cfs. When lower than 800cfs, habitat quantity and quality fall precipitously. The WF designed minimum flows so that 96% of the time there is at least 80% available habitat. In some years, there is not enough water to reach that amount. Minimum flows are a sliding scale. In a wetter year, the minimum flow will reach optimal flows. The old FMS bottomed out at 800cfs but in dry years, flows would revert

to the 1950s water right decision D-893¹, which would allow the flows to go as low as about 170cfs. The MFMS has an absolute floor at 500cfs. Other changes are different indices for measuring hydrology. The old FMS had no pulse flow. The MFMS has a pulse flow. The MFMS puts limits on the dropping of minimum flows to avoid dewatering of redds. The MFMS also developed an American River Index (ARI), which is basically the Department of Water Resources’ (DWR) measure of unimpaired flow for the season minus actual spills from Folsom. The spring pulse flow is modest but represents what the WF considered it could afford from a water supply perspective. It assumes fish agencies would meet and figure out how to employ that block of water for the pulse flow.



The Planning Minimum concept is included in Reclamation’s current BiOP. WF and Reclamation have tentatively agreed that 300 TAF is the number Reclamation will use for a three-year trial period.

Temperature Management. The Annual temperature management plan uses the same approach as the 2006 FMS which strives for 63 degrees F for juvenile steelhead rearing in the summer and 56 degrees F for fall run spawning. Because of variable hydrology, the approach is inherently adaptive. The WF considers an adaptive approach superior to a prescriptive approach (see below). It allows for flexibility and changing of standards every year. Most importantly, it requires ongoing investment in oversight of operations.

Prescriptive v. Adaptive Temperature Management on LAR

Prescriptive

- Rules are clearly stated
- Because of variable hydrology, temperature standard would either be:
 - High temp – less protective
 - Low temp – require frequent violations and exceptions

Adaptive

- Rules are flexible
- Standard gets set every year
 - Based on hydrology, storage, and expected operations
 - Dependent on modeling
 - Requires continual regulatory and/or stakeholder oversight

¹ In March 1958, the State Water Resources Control Board issued Decision 893 (D-893), granting permits to the Bureau of Reclamation (Bureau) for storage of water at Folsom. The Bureau’s permits were subject to minimum flows in the lower American River for fisheries resources, as provided for in a memorandum between the Bureau and California Department of Fish and Game (250 cfs from January 1 through September 14, and 500 cfs from September 15 through December 3). *Arthur Littleworth & Eric Garner, California Water (Third Edition), Solano Press Books, Point Arena, California, 2019.*

T. Gohring summarized that there will be ongoing costs for the FMS in WFII. Specifically, ongoing review of Reclamation’s operations, consideration of State Board engagement, ensuring adaptive management, and determining how flow would fit into the Voluntary Agreement and the Water Quality Control Plan.

Discussion.

B. Brooks invited questions and asked for the NSC to consider how the FMS presentation relates to WFII. Rob Burness asked how increases in water demand in the American River Basin are taken into account in the model for management of temperature and flow, asking if the increase in withdrawals from water purveyors is reflected in the modeling. T. Gohring clarified that the modeling includes current and anticipated future demands. He further explained that the American River is an export watershed. Changes in-basin don’t move the needle as much as other factors. G. Zlotnick reiterated that the American is an export river. He noted that with the American River Group (ARG) it’s been hard to get information from Reclamation to clarify the tradeoffs with Delta outflow, the Sacramento River connection and how those dynamics affect the American. T. Gohring responded that it’s part of the reason that he strongly recommends that WFII maintains some budget to continue working with Reclamation. T. Gohring further underscored that WF works hard to make the relationship with Reclamation cooperative, not adversarial. Reclamation has multiple objectives and stakeholders pulling that agency in many directions. Historically, other stakeholders have had a stronger pull with Reclamation than those in the Sacramento Region. Going back 10-12 years, Reclamation saw its primary objective as delivering water south of the Delta. That has changed over time. The WF has felt the tug between these competing interests. WF’s testimony on Water Fix has given the region more influence. Additionally, there is a whole other layer regarding how the State Board views this. J. Peifer expressed that he considers the FMS unfinished to be work and emphasized the need for WF to engage in the Water Quality Control Plan and/or the Voluntary Agreement processes. He emphasized that the FMS is “forever work” for the WF. Several other NSC representatives echoed this sentiment. Bill Busath asserted that the FMS is one of the most critical pieces to transfer to the new WF Executive Director, and he confirmed the City of Sacramento’s commitment to continuing to do this work. J. Ray asked T. Gohring to present an abbreviated version of the FMS presentation to the Business Caucus (BC). T. Rauh affirmed the importance of continuing to invest in the FMS. He asked about SAFCA’s project implications for the FMS. T. Gohring affirmed that there is a connection and SAFCA has stated an interest in engaging more deeply and consistently with the WF and in adding value to the region. C. Macdonald emphasized that the minimum flow standard is not what the river needs. 500cfs is not what the fish need. The Planning Minimum is just that, a minimum. R. Stork reflected on the history of the FMS, noting that originally the WF thought it would take a couple of years to complete which was 18 years ago. At that time, WF members told the WF Executive Director that funds could be taken from the Habitat Management Element (HME) for the development of the FMS although those funds had originally been raised for habitat management efforts. The HME program comprises contributions from water purveyors along with mitigation funds from Central Valley Project (CVP) contractors and other grants. There has been a recognition that 1) we were naïve to think we could get it done in 2 years; and 2) the program has become a “forever” program recognizing that this region is fundamentally in conflict with other regions that draw on this common river heritage. The WF has become an adjunct to regional struggles which will never end. There is no final resolution to this. This effort is on the backs of a funding source that was supposed to be committed to other activities. It has a bearing on several issues and implications on where the money comes from. J. Peifer expressed an interest in having a follow-up conversation at some point regarding the issues R. Stork raised.

Meeting Participants

NSC Representatives

Business Caucus

- Jim Ray, North State Building Industry Association

Environmental Caucus

- Ted Rauh, ECOS
- Barbara Leary, Sierra Club Motherlode Chapter
- Clyde Macdonald, Save the American River Association (SARA)
- Ron Stork, Friends of the River (FOR)
- Rob Burness, Sierra Club
- Barbara Evoy, ECOS (Alternate)

Public Caucus

- Bill Busath, City of Sacramento
- Kerry Schmitz, Sacramento County Water Agency (SCWA)
- Anne Sanger, City of Sacramento (Alternate)
- Inga Olson, League of Women Voters (Observer)

Water Caucus

- Dan York, Sacramento Suburban Water District
- Paul Schubert, Golden State Water Company
- Jim Peifer, Regional Water Authority (RWA)
- Tony Firenzi, Placer County Water Agency (PCWA)
- Greg Zlotnick, San Juan Water District
- Paul Helliker, San Juan Water District (Alternate)
- Sean Bigley, City of Roseville (Alternate)
- Darin Reintjes, PCWA (Alternate)
- Marcus Yasutake, City of Folsom (Alternate)
- Brian Poulsen, El Dorado Irrigation District (Alternate)

Water Forum Staff, Consultants & Facilitators

- Tom Gohring, Water Forum
- Bennett Brooks, Consensus Building Institute (CBI)
- Tania Carlone, CBI