

Blue Ribbon Committee for the Rehabilitation of Clear Lake (Committee)

Meeting #14

9:00 am-12:00 pm

April 1, 2021

Meeting Summary¹

Attendees:

See Appendix A

Action Items:

1. CCP will post the March 1 Special Meeting summary to the website.
2. Project workplans for the approved planning and modeling projects will be presented in future subcommittee and BRC meetings.
3. Alex Forrest to circulate cyanobacteria study published by Samantha Sharp on cyanobacteria study once available.
4. UC Davis TERC to provide an update on cyanobacteria studies in future Technical Subcommittee meeting.
5. UC Davis TERC to provide a targeted presentation on potential oxygenation pilot studies at the Technical Subcommittee.

Welcome and Introductions

Sam Magill (Facilitator), Sacramento State Consensus and Collaboration Program (CCP), opened the fourteenth meeting of the Blue Ribbon Committee for the Rehabilitation of Clear Lake (Committee) and welcomed Committee members. Committee Chair Eric Sklar provided welcoming remarks, noting the progress made by the Committee, including the recent approval of recommendations by the Department of Finance, which will be discussed further during Agenda Item 3. He touched on the recently passed federal relief package, which is expected to provide additional funding for projects in California, including the types of projects that the Committee will be recommending moving forward. Finally, he extended thanks to Committee members for their time and effort over the previous thirteen meetings.

At this point, the Facilitator initiated a round of introductions for committee members. Attendees may be referenced in Appendix A. Following introductions, the Facilitator reviewed agenda items and outlined expectations for the meeting.

¹ Except as specifically noted, all comments reflected in the summary were derived from Committee Member statements. Where applicable, specific responses are provided to individual comments/questions.

Items for Committee Approval

The Facilitator asked for any edits to the March 1 Special Meeting summary. Terre Logsdon commented that she had to miss the Special Meeting but would like the record to show that she voted in favor of the revised funding plan for the BRC recommendations that were submitted to the Department of Finance. The Facilitator said that this would be noted in the revised summary.

There were no other edits to the summary and the Committee approved the document. CCP will update and post the final summary on the Committee website (**Action Item #1**).

2021 Funding Update

The Facilitator introduced Lizzy Williamson from the California Natural Resources Agency (Resources), who provided an update regarding the approval of Committee recommendations for modeling and monitoring projects in the Lake. Ms. Williamson congratulated and thanked the Committee on the approval of \$3.55 million in Proposition 68 funding for select research projects around Clear Lake, and informed members that contracting discussions are forthcoming. She reminded committee members that the additional \$1.28 million in funding will still need to be used for in-the-ground projects. She also stated that the goal of Resources is to have additional funding that would go towards additional in-the-ground projects once the planning and modeling work is complete. Assembly member Aguilar-Curry and the Secretary of Resources are engaged in discussions to fund the rest of the Committee's 2020 recommendations as part of the state budget process. The Facilitator summarized the projects that the Proposition 68 funding will fund, including upper watershed modeling and monitoring, a bathymetric survey, and continuation of in-lake research – and further congratulated the Committee on this milestone.

Committee members provided the following questions and comments:

- Will we receive workplans and break-out costs for the \$3.55 million worth of work that has been approved?
 - The Facilitator responded that US Geological Survey (USGS) and University of California (UC) Davis had established budgets with cost break-down as part of the funding request, which can be made immediately available. The workplans are being developed as the contracting discussions move forward and can be presented to the subcommittees as well as the BRC in future meetings (**Action Item #2**).

Research Updates – Remote Sensing of Algal Blooms

Alex Forest, UC Davis Tahoe Environmental Research Center (TERC), presented an update on the research TERC has been conducting related to remote sensing of algal blooms. The goal of this research is to have a collaborative research group to predict, respond to, and address harmful algal blooms (HAB). Prediction of HABs requires validation of temporal dynamics (from satellite images), quantification of HAB variability (from spatial data), differentiation of algal and cyano-bacterial species, quantification of toxicity levels, exploration of impacts of water quality parameters on detecting HABs,

modeling the relationship between algal blooms and environmental conditions, and forecasting week-ahead HAB movement and distribution at Clear Lake. In an effort to accomplish this prediction, TERC has been conducting cyanobacterial studies including discrete sampling, radiometer data collection, autonomous underwater vehicle (AUV) collection, and unmanned aerial vehicle (UAV). Using the data collected, a TERC PhD candidate, Samantha Sharp, has developed an improved algorithm for HAB prediction (improved when compared the the SFEI/NOASS Remote Sensing Tool). This student has received a NASA scholarship wherein she will have access to high altitude HAB detection research funds. This student is working to have Clear Lake prioritized as a site for this research. Another PhD candidate, Kanarat Pinkanhananavee, is working with the Bureau of Reclamation to deploy in situ sensors – UV based fluorometers – for algal bloom monitoring. These research projects are contributing to developing an early warning system for toxic algal blooms. Once prediction is accomplished, sensors can detect and produce an early warning for HABs.

Committee members provided the following questions and comments:

- During the cyanobacterial studies, are you testing for toxins, species, or a whole suite of things?
 - Mr. Forest responded that TERC was not funded for this work, so they were not doing toxins here, we were using chlorophyll A as a proxy for cyanobacteria. We did do phycocyanin in the lab, but there were issues with the lab wherein samples were lost. A paper is being published by Samantha Sharp on this study and can be circulated in the next couple of weeks (**Action Item #3**).
- The variability within a bloom is useful because when we do shoreline monitoring, there are areas we are not monitoring, so understanding variability within the lake would be very helpful.
- Does the Samantha Sharp discuss the efficacy of using chlorophyll A as a proxy for cyanobacteria?
 - Mr. Forest responded that, yes, she does, and she also discusses the limitations. The sensors could detect chlorophyll but not phycocyanin.
- Regarding the calibration of the SFEI/NOAA HAB Remote Sensing Tool, is SFEI or the Water Boards going to adopt the new tool since this one does not appear to be working?
 - Mr. Forest responded that it is unclear how to get the TERC version of the tool to the public. A more robust study is still needed due to the lab issues. At some point, we can have a meeting with Keith and Randy about where to take this tool next.
- How many fluorometers will be deployed in Clear Lake and will we have access to real time data?
 - Mr. Forest responded that at this point, we do not know, but Daniel Deeds has written a Reclamation grant for funding for low-cost sensors (\$500 a unit). Once we have a prototype for this low-cost sensor, there would be 10-15 that would create a chain of sensors. The chain would be telemetering the data real-time. This would create continuous results. The timeline is unknown. Since it is cheaper, it may not be as high quality, but there will be more, real-time data.
- Is the PhD candidates' work part of TERC's contract?
 - Mr. Forest responded that no, they are separate.
- The Facilitator noted that an update on this research should be provided in an updated Technical Subcommittee meeting (**Action Item #4**).

- Clear Lake is a shallow lake and stratifies in the summer. Often blooms occur after stratifications. Will water quality and velocity be incorporated into the model?
 - Mr. Forest responded that TERC initially tried to validate the model velocities with the velocities of the lower arm at the beginning of the season. It was more difficult to validate the model during periods of stratification. TERC is working to validate the model during an unstratified period and then, once there is a stratified season, go back and see if it is working. The next step is to put out more ABCPs (instrument to measure water velocity) in key locations in the Lake where there are exchange flows.
 - Alicia Cortes added that the ADCPs are scheduled to be deployed in a month to capture a spring period. This will complete the sample data set for conditions over a year. Hopefully that will provide the information needed to calibrate the model.
- The Facilitator asked about the timeline for the overall project to have the model calibrated and functioning for the committee's consideration.
 - Ms. Cortes explained that there have been several difficulties with collecting data, but once the spring-time data is collected, it should happen more quickly. Summer is a realistic timeline.
 - Geoffrey Schladow, UC Davis TERC, added that the calibration and validation of the model is a prelude. Once TERC has it, they can use the model as a tool to explore the questions that BRC has.

Research Updates – UC Davis Center for Regional Change (CRC) Update

Jonathan London, UC Davis CRC, provided an overview of the work that CRC is providing for BRC. This includes a socio-economic analysis, community economic development strategy, and a tribal engagement strategy. While CRC has presented on the socio-economic analysis in the past, the final draft of the Lake County socio-demographic report will be presented to the Socio-Economic Subcommittee (SES) on April 20. The tribal engagement strategy will be presented in the current meeting, and a draft of the tribal communities and natural disaster planning and recovery report will be presented at the April 20 SES meeting. Further, a draft of the Regional Disaster Planning and Recovery issue brief and white paper will be presented to SES on April 20, as will several economic development issue briefs including environmental education, youth and workforce development, broadband development, and agricultural and natural resource tourism. All of these deliverables will be submitted to BRC in June 2021. Anne Visser, UC Davis CRC, and Clara Cannon, UC Davis CRC, presented on Five Core Areas to Support and Promote Recovery to Natural Disasters: Insights from Tribal Communities in Clear Lake Region. The goals of this report are to offer an understanding of challenges to disaster recovery identified in the Clear Lake region, to highlight five recovery core areas for tribal nations and other stakeholders in the region, and to provide a list of resources available from UC to address disasters and support community resilience. Five core recovery areas were established through analysis of the available literature on the topic and stakeholder interviews with tribal government representatives, members of BRC, and other agencies that serve tribal nations in the region. The five core recovery areas identified by CRC are economic recovery, health care and social services, housing, infrastructure systems, and environmental stewardship. These five recovery areas are interrelated and three major themes emerged: the economy, the environment, and society. From these five core areas, 12 activities were identified to promote disaster recovery. These 12 activities may be referenced on the

right column of slides 8-9 in CRC's presentation. In addition to these activities, CRC identified 6 actions for pre-disaster planning in tribal communities: identify ways to build upon existing plans and initiatives, conduct vulnerability analysis, identify and assess recovery capacity, establish recovery priority areas, adopt recovery ordinances, and continually update of the Hazard/Mitigation Plans.

Committee members provided the following questions and comments:

- There are long-standing issues within the Lake and the loss of access to resources that were extremely important in traditional activities and the perception and reality of lake contamination resulting in the removal of the ability to safely consume fish. There's no longer full engagement with species, which occurred before more recent disasters. How will you integrate the longer-term issues into the recovery and the plans for next steps?
 - Ms. Cannon replied that that is great feedback. CRC can add more to historical context around the slow pollution of the lake and consequences for tribal communities. This would be a positive addition to the report.
 - Mr. London added that discussing the oppressive and violent marginalization of tribal communities over time and the lack of full integration into planning efforts until recently is a historical perspective that is very important.
- The Facilitator noted that due to the technical and socio-economic overlap around this subject, a joint meeting may be warranted in the future.

Local and Committee Member Updates

Sarah Ryan, Big Valley Rancheria, provided a cyanotoxin update based on the most recent sampling event from March 22. This sampling included winter monitoring at 10 sites around the Lake. Five of these sites were sent out for analysis due to the microcystin seen in the samples. There was a low level at Shady 01, which had a warning last month, so it went down. Keys 03 had 7,000 microcystin gene copy counts and Lake Oak had 3,000 microcystin gene copy counts. If this trend continues, the Lake could start seeing microcystin in these areas. Big Valley is continuing monitoring including sampling from the Department of Water Resources and UC Davis when they are doing their own collection. The Facilitator noted that the warning is related to the next topic.

Karola Kennedy, Koi Nation of Northern California, informed participants that the Division of Drinking Water, which regulates the 18 public water systems that use Clear Lake as source water, issued a cyanobacteria related monitoring order. The order mandates systems to monitor for microcystin in both raw and finished water, on either a weekly or bi-weekly basis during the summer months, and to conduct triggered monitoring in the winter months. When the raw water hits .3 micrograms per liter, it will trigger weekly monitoring for the systems. If a system chooses to only monitor the finished water, the recreational values will trigger the weekly summer month monitoring beginning May 1 and go until October 31 when it will go back to winter month triggering. Keith Ahart, Golden State Water, mentioned that Golden State Water would be conducting such monitoring and is appreciative of Ms. Ryan and Ms. Kennedy's work on this issue.

Terre Logsdon, Scotts Valley Band of Pomo Indians, provided an update on the Tribal EcoRestoration Alliance (TERA). TERA just completed the first round of the native stewards training in March. Thirteen individuals completed the training, which is funded in collaboration with New Paradigm College, US Forest Service - Mendocino National Forest, the Bureau of Land Management – Berryessa Snow Mountain Wilderness, Robertson Rancheria, and Scotts Valley. The training is 130 hours and brings together ecological literacy, traditional ecological knowledge, vocational skills, and land stewardship with a focus on fuel management and fire resilience. Of those who complete the program, 5-6 can be hired to create a crew. The crew will do work on municipality land in the region. The program is currently hiring a program assistant, with a native hiring preference. Another round of training will occur in the Fall.

Committee members provided the following questions and comments:

- This is a great project. Are there plans for more crews? Also, is nutrient management and erosion control part of the curriculum? How was the curriculum developed and were guest speakers included in that curriculum?
 - Ms. Logsdon replied that they are hoping to have an additional crew in the Fall. There was a curriculum committee, and the curriculum did include nutrient management and other watershed issues. There were guest speakers including Karola Kennedy.
 - Ms. Kennedy added that she had provided a day of water quality and water shed management training with the group. She also noted that there were other guest speakers and topics included a chainsaw use certification and prescribed burning.

Committee Discussion and Decision of Potential Projects

The Facilitator introduced the interactive exercise that will allow committee members to highlight the projects they believe deserve the highest priority as BRC weighs project options for the \$1.28 million in funding allotted to on-the-ground projects. He reminded the Committee of presentations that had previously been made regarding Kelseyville fish passage and Close Creek hitch habitat, which may be options for the prioritization exercise. Ultimately, the intention of the activity is to clarify priorities prior to recently-funded research activities being completed. The Facilitator provided instructions to attendees, and then all participants were split into two breakout rooms to conduct the exercise.

Group 1's suggested projects and votes received for each project as a priority are included below.

- Complete Kelsey Creek Fish passageway project-3 priority votes
- Plan and implement Clove Creek Clear Lake Hitch restoration project-3 priority votes
- Public workshops on shoreline health initiatives, HABs, climate change, and other critical lake health topics- 2 priority votes
- Pilot scale trial of oxygenation projects on one arm of Clear Lake- 2 priority votes
- Trash clean up projects on creeks and shoreline- 1 priority votes
- Tule replanting- 1 priority vote
- Higher resolution mapping of agricultural land uses- 1 priority vote
- Youth engagement programs for environmental monitoring- 1 priority vote
- Long-term monitoring of the socioeconomic impacts of lake restoration- 1 priority vote

- Focused recommendations on harmful algal blooms and fish kills- 1 priority vote (note that this is a high priority item as defined in AB 707)
- Continued validation of remote sensing information- 1 priority vote
- Environmental education programs for schools focused on the health of Clear Lake
- Develop a citizen science application to help engage the public in environmental monitoring (shoreline cleanups, fish kills, etc.)
- Water treatment for disadvantaged communities
- Map culverts around Clear Lake
- Create a GIS layer for wildfire impacts
- Invasive species removal
- Programs to connect private water intakes and domestic wells to local water systems

Group 2's suggested projects and votes received for each project as a priority are included below:

- Complete Kelsey Creek Fish passageway project. This effort has been ongoing since 2016 with good momentum from the tribes – 4 priority votes
- Support Middle Creek planning/shovel-ready project to reduce nutrient input – 4 priority votes
- Public education, and education center related to water quality, possibly part of Middle Creek – 3 priority votes
- Full Time Project Manager for Middle Creek Restoration selection process – 2 priority votes
- Tile plant restoration along shoreline – 2 priority votes
- Mouth of Kelsey Creek wetland/riparian habitat restoration to reduce nutrients and benefit Hitch nursery habitat – 1 priority vote
- Additional broad public outreach of BRC efforts – 1 priority vote
- Find ways to properly manage private levees on Scotts Creek – 1 priority vote
- Erosion control bmps on agricultural land
- Study and possibly advocate for closure of all in-stream creek crossings year round
- Identify projects to reduce nutrient loading while gathering data to support
- Coordinated and public groundwater/well usage and reporting
- Support for large-scale/commercial native plant nursery
- Pull together all Environmental ED providers for cohesive planning
- More creek barrier removal projects to support fish habitat
- On the ground projects

Themes that arose in both of the groups included public outreach, education and engagement, tule plant restoration, and the Kelsey Creek restoration project.

Committee members provided the following questions and comments:

- Is arm oxygenation (posted in Group 1's priorities) a feasible project?
 - Mr. Schladow explained that oxygenation is practiced across the country and is a technology that may be useful to a number of desired end goals including reduction in phosphorus, HABs, and fish kills. Doing a trial of this sort of program deserves thought, perhaps by the technical subcommittee.

- o Others concurred that this would be an interesting and beneficial project and could also be a low-cost project in collaboration with watersheds that already do monitoring.
- There is already small-scale oxygenation occurring that could be supplemented to increase the data. Big Valley does this and there are other entities within the Keys that do so. While this is a large lake, the shoreline could be a target area to reduce impact. Is there a way to integrate what is already happening with aeration with what is being suggested?
 - o Mr. Schladow said that he would like to learn more about the already occurring activities, but that ultimately the middle of the lake is causing the shoreline issues, so it should be addressed Lake-wide. The shoreline work is an immediate fix, but the pilot could explore how oxygenation at the bottom of the lake impacts the shoreline. The Facilitator suggested a targeted presentation on oxygenation at the Technical Subcommittee (Action Item #5).
- The water purveyors around the Lake as part of the watershed sanitary survey recently applied for grant funding for pilot studies with air curtain around intakes and ultrasonic devices around intakes. This could be an interesting collaboration for information-sharing. I agree that the root cause is an important area of research.
- There are a lot of votes for Middle Creek. Are we waiting for UC Davis' research on bio viability of phosphorus uptake to feed blooms? It sounded like it may be higher than what was initially modeled in previous studies, which would affect how much nutrient input is determined to be coming from Middle Creek. If more is in-lake loading than what was originally modeled, when will the recalculation happen?
 - o Mr. Schladow responded that a student is trying to quantify this using the assumptions of the previous study. A report is expected in three months.
 - o Mr. Ahart noted that it would be valuable to have a better idea of in-loading and out-loading. There is a political element regarding getting funding for the workplan for this type of work. All information we can get will help with moving this forward politically.

The Facilitator informed participants that the information collected during this exercise would be included in the meeting summary and Committee members should provide adjustments, questions, and comments related to the suggestions that arose from this activity during their review of the summary. Ultimately, the projects that were established as priority will be reviewed by the Subcommittee or SES for further investigation and solidification and then brought back to the BRC at the next meeting.

Public Comment

The Facilitator opened the floor for general public comment. There was none at that time. The Facilitator deferred to Mr. Sklar for closing remarks. Mr. Sklar reiterated the usefulness of prioritizing future projects and the hope for funding for all projects that are considered priorities in the future. The Facilitator gave a final opportunity for questions, and then closed the meeting.

ADJOURN

Committee Members Present			
First	Last	Organization	Title
Eric	Sklar	California Fish and Game Commission	President, Blue Ribbon Committee Chair
Sarah	Ryan	Big Valley Band of Pomo Indians	Environmental Director
Jennifer	LaBay	Central Valley Regional Water Quality Control Board	Nonpoint Source Program Manager
Karola	Kennedy	Koi Nation of Northern California	Committee Representative
Wilda	Shock	Lake County Economic Development Corporation	Committee Representative
Brenna	Sullivan	Lake County Farm Bureau	Executive Director
Harry	Lyons	Lake County Resources Conservation District	President
Mike	Shaver	Middletown Rancheria of Pomo Indians	Environmental Director
Terre	Logsdon	Scotts Valley Band of Pomo Indians	Environmental Director
Keith	Ahart	Golden State Water Company	Alternate Representing Today
Paul	Dodd	University of California, Davis	Associate Vice Chancellor
Moke	Simon	Big Valley Band of Pomo Indians	Alternate
Committee Members Absent			
Scott	Harter	Lake County Special Districts	Administrator
Linda	Rosas-Bill	Habematolel Pomo of Upper Lake	Environmental Director
Irenia	Quitiquit	Robinson Rancheria of Pomo Indians	Environmental Director
Eddie	Crandell	Lake County Board of Supervisors	Supervisor
Alix	Tyler	Elem Indian Colony	Environmental Director

Public Attendants and Staff	
Name	Organization
Lizzie Williams	Natural Resources Agency
Geoff Schladow	UC Davis Tahoe Environmental Research Center
Alicia Cortes	UC Davis Tahoe Environmental Research Center
Anne Visser	UC Davis Center for Regional Change
Cathy Treppa	Habematolel Pomo of Upper Lake
Tracy Treppa	Habematolel Pomo of Upper Lake
Jonathan London	UC Davis Center for Regional Change
Clare Cannon	UC Davis Center for Regional Change
Alex Forest	UC Davis
Timeofey Poliakov	UC Davis Student
Ming Shi Joy Chu	UC Davis Student
Isais Mata	UC Davis Student
Chris Cadrone	UC Davis Student
Sam Magill	CSUS Consensus and Collaboration Program
Danaka DeBow	CSUS Consensus and Collaboration Program