



## Lake Almanor Watershed Group Meeting

Wednesday, March 28 2018 2:00-4:00pm, *Maidu Summit Consortium Office, Chester, CA*

**Members present:** Aaron Seandel, Lorena Gorbet, Peggy Fulder, Bridie Johnston, Aaron Seandel, Charlie Plopper, Sherrie Thrall, Gina Johnston, Carl Felts, Scott McReynolds

**Sierra Institute staff present:** Courtney Gomola

**Guests present:** Karen Klevin (FRLT)

**Review of agenda and approval of minutes:** Meeting minutes and agenda approved

**Introduction of guests:** Karen Klevin is the Development Director at the Feather River Land Trust (FRLT). FRLT is submitting a grant to the Rose Foundation on water quality and education and she was seeking a letter of support from LAWG. The group thought it would be good to support the proposal and hopes it can connect with or help support LAWG initiatives. Karen will send a draft to Chairs.

**Financials:** Courtney presented the financials. There was a question about a payment to Doug Maxfield that went in around the time the new data loggers were purchased back in 2014/15. There was also a question if the 2% overhead will be taken out the \$1500 anonymous donation. Courtney will follow up. The group agreed to allocate the \$1,500 donation to support Courtney's time in watershed coordination and proposal development, with Courtney keeping them apprised of how money is spent.

**Follow up:** A check was mailed to Douglas Maxfield for deep water buoy installation in the amount of \$1,290.00 on December 24, 2014 and paid with a Department of Conservation grant that Sierra Institute (SI) had for watershed coordination. LAWG ultimately reimbursed SI for this when LAWG money was transferred to SI in June 2015. A 2% fee will be taken out of the donation to cover administrative costs.

**Conversation with LACC:** Scott, the new manager at the Lake Almanor Country Club (LACC) has raised questions about the need for their continued support. Aaron spoke with Scott and he seemed sensitive to the issues, but wasn't aware of the of the history, the in-kind support from DWR, and thought the County provided regular water quality monitoring service. Scott will speak to the LACC Board about the need for the continued \$3/lot to support water quality monitoring, with the group pointing out outcomes from this work (such as ineffectiveness of the proposed thermal curtain), as well as how a poorly monitored and managed lake could dramatically reduce property values at the gated communities. Aaron requested that Scott and Gina send a final report as soon as possible so that he can share it with LACC and Almanor West.

If LACC chooses to reduce their contributions, the group will have to reconsider their sampling regime. The group decided to move forward with 2018 sampling, and to continue to support the sampling while they have in-kind support from DWR. Scott has support to do sampling at Almanor through June and thinks he will receive another fiscal year of support in July.

**2017 Water Quality Report-** Gina reported that 2017 was a very important year: 2015 was the driest year in recorded history, 2016 was fairly normal, and 2017 was wettest in recorded history. This allowed for comparison of how the Lake responds to rapid changes in precipitation, and how variable changed under these conditions.

2015 represented the driest in a series of dry years, which resulted in higher water temperatures and more nutrients and algal content due to less water/snowmelt entering the lake. Increased precipitation in 2016 saw many of these deleterious trends improve, with 2017 being one of the best years in terms of cool, oxygenated water in a larger proportion of the water column. Unfortunately, at 53% of typical snowpack levels on April 1, the current year may do worse in many water quality metrics. Due to the challenges with Oroville Dam, a lot of water has been held back in reservoirs in the Upper Feather River Watershed, which may help ameliorate low precipitation levels.

Comparison of 2015-2017 shows that importance of snowpack contributions to ensure cool waters feed to Lake. Even with heavy precipitation, if this fall as rain rather than snow, water filling the lake will be warm and won't

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contribute to good aquatic habitat for fish. Lack of snowmelt coupled with overall low precipitation (like in 2015) demonstrate that the Lake doesn't have the cold-water reserves needed to deliver cold water downstream, negating any intended outcomes of a proposed thermal curtain for downstream cold-water delivery. For additional key take outcomes from the report see attached Summary.

For next year, Gina would like to do a deeper look at metal concentration changes over time (which would likely highlight the effect of the Mountain Meadows Reservoir draining), as well as a deeper comparison of all metrics over the last five years. She would aim to bolster these findings with related climate data.

Aaron believes this is all great information but wants to reach a larger audience. Scott suggested the group ties in with the fishing section in the local paper. Gina will send Courtney a summary of results, which she will turn into a press release that will be reviewed by Scott and Gina before being sent to the paper. Courtney will also work to make the key information more accessible on the Sierra Institute website. Scott suggests showing a temperature graph for the North Fork Feather River (NFFR), where most of the public will have the greatest connection.

**Rose Foundation Grant:** Courtney has been working with the AP Environmental Science (APES) teacher at Chester High School. Scott will give a presentation to the class on his work then take them out to sample at the NFFR, which will complement the water quality sampling the class has done this year. Courtney will then work with the class to explore LAWG data related to NFFR, looking for trends in the data. Students will then research variables, create a diagram showing connections between variables, and identify ways that they can positively influence water quality in the Lake Almanor through their actions. Nils will also give a presentation to the class on his watershed stewardship work in the region. Scott is looking into donating an old logger to the school, as long as the school can set aside a small amount of funding to maintain the equipment.

**Wastewater/Storm water Assistance:** Courtney reported that the Office of Sustainable Water Solutions will not be providing technical assistance, as their project seek mainly to support groups that are doing infrastructure improvements (addressing the problem, rather than identifying the problem, as LAWG seeks to do). Courtney is looking to develop a proposal to the Campbell Foundation. The group suggested to proposal support expanded water quality monitoring to include coliform sampling during peak lake use, focused on Rec 1 and 2 on the Peninsula, Rocky Point, Almanor West, Westwood Beach, and a few sites along the East Shore. They also suggested the grant be written so that the current water quality monitoring can be supported if LACC decides to discontinue or reduce their current support. Gina and Aaron will send Courtney information on costs of sampling.

**Mountain Meadows Conservancy:** Charlie reported MMC is working on advancing two projects: 1) to upgrade the Indian Ole Dam, including installing a parking lot, bathroom, and trail (there is interest from the Stewardship Council on funding this, but PG&E wants to ensure proper insurance is in place); and 2) purchasing the "Gateway" property to provide more access to MMR (FRLT has an agreement from the landowner on acquiring the property; they have \$10,000 from an anonymous donor to support it but the majority of needed funding and ultimate purchase will be dependent on a grant from the Long Foundation, which they should hear about by June).

**Maidu Summit Consortium:** Lorena reported that the comment period is ending on the PG&E transfer of deeds at the Lake Almanor Planning units and Humbug properties. A vote on transferring the Humbug Valley property to the Maidu Summit Consortium will take place on May 2.

**Water Trails/Recreation:** Caribou Alliance for Trails has an Earth Day event planned on April 20 (students) and 21 (all ages) to celebrate the Collin's Pine Trail. Progress has been made on sign development and trail work, with a donation from the Elks Club supporting bridge construction over a wet area. Progress is also being made on the Almanor Rail Trail, with the group working to find a sample rail-to-trail lease to present to Collins. The goal is to also have the trail extend from the high school to the overflow/drainage ditch that runs out of town.

**Action items/homework:** Next meeting is scheduled for Wednesday May 9 from 2-4:00pm at the Maidu Summit Consortium. Gina will send out her 2018 proposal to the group. Courtney, Scott and Gina will work on items outlined under 2017 Water Quality Report.

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## **Summary: Lake Almanor Water Quality Report 2017**

A water quality monitoring program for the Lake Almanor watershed was initiated by Mr. Scott McReynolds, California Department of Water Resources (DWR) and Dr. Gina Johnston, California State University, Chico, in 2014. The Sierra Institute for Community and Environment and the Lake Almanor Watershed Group (LAWG) provided oversight for the study.

Due to limited resources available for the program, LAWG selected some of the important parameters that have been monitored in the past by DWR, by Plumas County and by Pacific Gas and Electric Company. Four sampling windows were chosen to provide a look at lake health: during spring turnover (April), the period of heavy recreational use (June and late August or early September) and fall turnover (November). Three lake stations were chosen, as well as stations on North Fork Feather River In Chester and at Canyon Dam, on Hamilton Branch and on Bailey Creek.

Parameters that were monitored included:

1. Physical: temperature, dissolved oxygen, Secchi depth, electrical conductivity, pH and turbidity
2. Chemical: many inorganic and organic elements and compounds, including nutrients (nitrogen and phosphorus compounds)
3. Biological: phytoplankton and zooplankton abundance

This is a summary of the results of the 2017 study.

Because 2017 was an above average year for precipitation, snowmelt and runoff resulted in cool lake water temperatures in April compared to previous years. Thermal stratification was only weakly established in June and there was sufficient cool water and oxygen throughout the lake for all species of fish. By late August thermal stratification was well established and oxygen was depleted from the deeper waters in the eastern basin below 12 meters. This was due to lack of mixing with the surface water and decomposition. By November the lake had cooled and was again well mixed and oxygenated. The period of oxygen depletion was shorter in 2017 than in previous years because of the cooler inflows to the lake in spring and the colder initial water temperature.

Temperature loggers in Hamilton Branch showed that the input of cool water from springs kept it several degrees cooler than the lake in summer. This provided a refuge for fish when the water in the lake became too warm.

Secchi depth is an indication of water clarity due to suspended particles in the water column. These can come from sediment carried by inflowing streams or by phytoplankton. The higher the number, the clearer the water is. It was 3 – 3.5 meters in April and increased in the summer to as much as 9.7 meters in the eastern basin. By November it was 3 meters at all stations in the reservoir.

Electrical conductivity is a measure of the dissolved salts in water. Values in 2017 were near 87 micro-mhos/cm at the lake stations in April and about 35 micro-mhos/cm in the North Fork Feather River. These values increased slightly over the course of the year as precipitation and runoff ended. Overall, the values for electrical conductivity were lower in 2016 and 2017 due to increased precipitation in the watershed.

Nutrient concentrations were generally low in 2017 due to the diluting effect of the precipitation. The highest levels were found near the bottom in the lake during the summer due to decomposition and the release from the sediments.

Phytoplankton abundance is closely tied to nutrients and water temperature. Its growth is a concern because it makes the water green and can negatively impact shallow water use. Some bluegreen algae produce toxins,

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which may be harmful to pets at very high concentrations. Because of lower nutrient levels and cooler water temperature, phytoplankton were generally less numerous in 2017. Bluegreen algae were present in high numbers during the summer but dropped after September.

Generally, Lake Almanor was in good health following two years of above average precipitation. The effects of the emptying of Mountain Meadows Reservoir in September 2015, which added nutrients and metals to the eastern basin, had disappeared. The period of oxygen depletion in the summer was shorter than in previous years, which meant that cold-water fish species were under stress for a shorter time.