

# ***Aechmophorus* Grebe Conservation Project Almanor, Eagle, and Antelope Lakes**

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*Prepared by*

Plumas Audubon Society  
429 Main Street  
Quincy, CA 95971

*Prepared for*

Audubon California  
765 University Avenue  
Sacramento, CA 95825

## **SUMMARY**

We had a huge impact with grebe outreach and education again this year. Our third Grebe Festival was a great success, reaching a large and focused audience with our grebe conservation message. The festival attracted over 150 participants and gave many of these individuals up close views of the grebes.

Plumas Audubon Society staff, interns, and volunteers, conducted a variety of outreach and education efforts in 2016 including tabling at numerous events, giving school classroom presentations, and leading youth field trips.

We continued our monitoring efforts at Lake Almanor and observed the loss of almost an entire generation of *Aechmophorus* grebes on the lake. Eagle Lake had successful reproduction for the second consecutive year after a five year breeding hiatus.

## **OUTREACH and EDUCATION**

Outreach and education efforts are a priority for the remainder of the grebe conservation project (through 2019). Plumas Audubon Society (PAS) interns and staff, as well as community volunteers, conducted a variety of grebe outreach and education efforts in 2018 including the 3rd Grebe Festival, tabling, classroom presentations, and youth field trips.

### Grebe Festival

The Grebe Festival has both a wide and deep reach in terms of grebe education and outreach. We held our third successful Grebe Festival on August 24-26, 2018 in Chester, CA. We had approximately 150 participants at this year's festival (lower turnout than 2016 and 2017 at around 200 participants each), with around two fifths of our guests returning after having attended either or both of the previous festivals. Year after year participants expressed great satisfaction with their

fieldtrip experiences and their appreciation for the size of the festival and this year was no different. We received very positive feedback from numerous participants related to their festival experience and we've been receiving multiple emails from folks who are eager to attend the Grebe Festival again next year.

We offered again this year many of the same great fieldtrips from previous years including pontoon and kayak tours on Lake Almanor; birding along the North Fork Feather River and at Lassen Volcanic National Park; botany, birding, and oding at Willow Lake; a photography workshop; a cultural and conservation tour of ancestral homelands of the Mountain Maidu; scoping from shore; documentary screening; and evening owling around the lake. In addition to these expert-led trips we added this year a boat tour on Eagle Lake, a watercolor painting workshop, and a wildlife stamp carving workshop. On Saturday evening we offered a family-friendly social mixer and silent auction with live local music, games, vendors, and local craft beer followed by presentations from five local conservationists. Altogether we offered 35 different activities, fieldtrips, bird walks, and workshops that invited participants to learn about the ecology and conservation of *Aechmophorus* grebes, to experience the great wildlife viewing on and around the Almanor basin and beyond, to gain awareness of and respect for the area's native peoples and their cultural heritage and practices, and to shine a light on our human disruption of natural processes and some of the consequences thereof on wildlife.

Our free Scoping from Shore activities along the Highway 36 causeway allowed both festival-goers and the general public to learn about and see first-hand the devastation of the large grebe colony that had formed, had grown immensely, and then had been entirely abandoned only weeks prior to the festival. The information, before and after photos of the colony, and the opportunity to directly view the abandoned grebe nests was deeply moving and disturbing to most observers. We hope that the emotion displayed by many after hearing about this year's colony disaster and then seeing the aftermath moves people to take action in some form, whether that be to write a letter a representative in public office or at PG&E or to a newspaper editor, or whether that be to donate time or money toward grebe conservation efforts.

Additionally heartbreaking, yet powerfully moving and beautiful is the documentary *Albatross* which we were able to screen free of charge thanks to the producers giving this film to the world as a "new-paradigm gift-economy offering". A film by artist Chris Jordan, *Albatross* is a love and loss story about birds on Midway Island in the heart of the Pacific whose bodies are filled with our plastic pollution that heavily litters the ocean. The film challenges us to have the "courage to face the realities of our time" and without directly saying so, asks us to look at our own contribution to this particular problem and disturbing consequence of our plastic waste and then to consider changing that in our own lives. Many participants left the film heartbroken, but with an important conservation message embedded that hopefully carries over to influence and lessen consumptive behavior.

Our boat tours took 81 people out to see grebes and other birds up close on the lake. For folks previously unfamiliar with the birds and even for already passionate birders, the opportunity to experience the grebes up close through our pontoon and kayak tours allows for a more intimate sense of connection to the grebes and greater desire to do something to help in their conservation.

We also invited Chester Elementary School 5<sup>th</sup> graders to join us at the Grebe Festival as this was the first year school was in session at the time of the festival. Thirty students from two classes, along with a teacher and three parent volunteers joined Plumas Audubon for almost a full-day fieldtrip on their third day of school (120 student hours; 4 educator hours; 20 volunteer hours). On their first bird

walk of the school year, the students started their day on a newly created nature trail and were guided by two PAS volunteers. Following the bird walk the students came back inside for a presentation on Western and Clark's Grebes which highlighted their climate endangered status and then had chance to play our grebe race and ring-toss games. The group then traveled to a part of Lake Almanor where grebes and Osprey are known to hang around. The students got the chance to see grebes in person and were delighted by the close sighting of a Bald Eagle, which was a great way to peak their interest in birds at the start of their "Bird Year" at school. The teacher told us that she loved this fieldtrip and would like to do it every year!

All three years of the Grebe Festival have been very successful in terms of outreach to a large, focused and concerned audience of non-birders through expert birders on wildlife conservation and, in particular, *Aechmophorus* grebes' unique behaviors, habitat, and issues affecting their breeding success.



Above: Fifth grade students from Chester Elementary join us at the 3<sup>rd</sup> Grebe Festival.

## Other Outreach and Education Efforts

In addition to the great scale of education and outreach conducted at the Grebe Festival, Plumas Audubon staff, interns, and volunteers also conducted a variety of other outreach and education efforts in 2018 including tabling, school classroom presentations, and leading youth field trips. The information provided at these events included grebe brochures, pictures of and general information about Western and Clark's Grebes, a wooden sculpture of a Western Grebe, a Birds and Climate Change display with information on the predicted range changes for *Aechmophorus* Grebes, and the grebe ring toss and grebe race games that were created by a few volunteers for last year's Grebe Festival.

In May, Plumas Audubon Society once again tabled at the Children's Fair which attracts hundreds of children and their families from across the county.

In June and July, Plumas Audubon had a crew of six local youth from around Plumas County join us in meadow restoration on the Plumas National Forest for six weeks. These six interns were introduced to Western and Clark's Grebes, taught how to identify grebes, and discussed a bit of their ecology.

In past years we have usually participated in the Eagle Lake Nature Program offering a grebe presentation and bird walk for youth and families at the Gallatin Marina at Eagle Lake. Unfortunately this year the Nature Program was cancelled due to the Whaleback Fire in late July and early August which burned immediately adjacent to Eagle Lake on its west side causing mandatory evacuations in the Eagle Lake area.

In September, PAS's table at the Sierra Valley Art+Ag event was visited by about 250 people.

Finally, in April through October, Plumas Audubon sponsored and tabled (PAS is the sole tabler) at nine small outdoor concerts hosted by the local native plant nursery, California Sister Nursery, with 25-100 attendees at each event. In between sets a PAS representative usually has the opportunity to address the audience and highlight the work we do. During this time the Grebe Festival was usually advertised and at the final event, the 2018 Almanor grebe colony disaster was discussed and highlighted resulting in a number of attendees signing the petition to encourage PG&E to adhere to the PAS recommended maximum water drop rate during the grebe breeding season.

## Fishing Line Receptacles

Plumas Audubon Society did not have the resources to install and continuously maintain the fishing line receptacles that we had which were intended for Lake Almanor. We contacted the Almanor Fishing Association, a non-profit organization focused on preserving and enhancing Lake Almanor as a high quality fishing resource, and they were happy to accept the ten receptacles PAS had and were willing to take on the task of both installing and maintaining them.

Our Project Manager, Brad Graevs, found a Western Grebe entangled in fishing line during one of his surveys and, thankfully, was able to successfully free the grebe.



*Left:* Western Grebe entangled in fishing line and stuck to willow branches. *Middle:* Close-up of the fishing line entanglement. *Right:* Release of Western Grebe after removing fishing line. *Photo and rescue credit:* Brad Graevs

## SURVEYS and MONITORING

### 2018 survey results

**Table 1.** Summary of adult counts, nests, and young on each lake.

Lake	Peak # nests	Ave. adult census	Peak ratio juv:adults	Est. # young
Almanor	1205	3485	0.002	9
Antelope	3*	103	0.18	19
Eagle	-	-	-	-

\*Peak nesting not observed at Antelope Lake. Thirteen broods observed the same date as the three active nests reported.

NOTE: Eagle Lake census scheduled for Oct 18, 2018. No complete census surveys were conducted on Lake Davis in 2018.

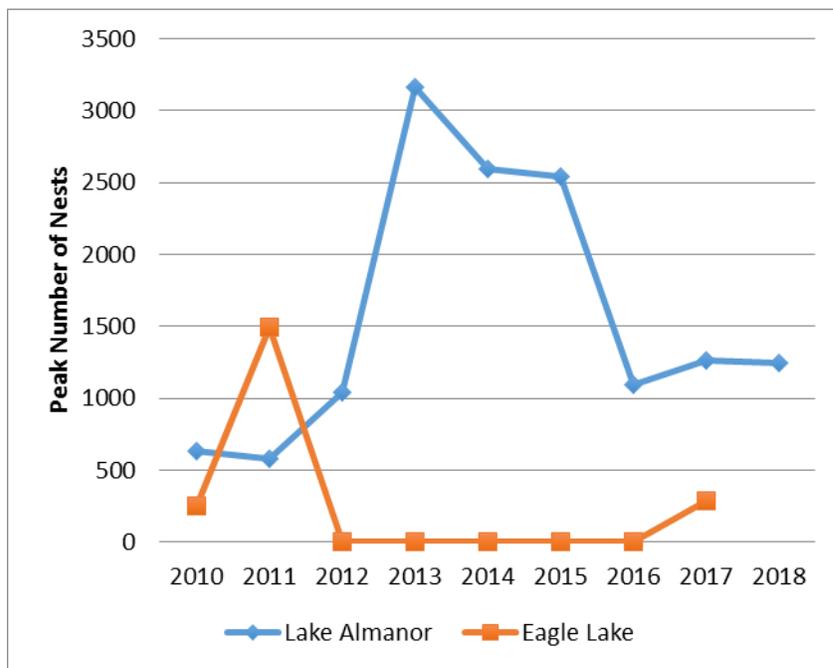
#### *Eagle Lake*

In 2018 *Aechmophorus* grebes were found breeding at Eagle Lake for a second consecutive year after a five year breeding hiatus. The great amount of precipitation that Northern California received the past two years brought Eagle Lake's water level back up to where tules could successfully grow and once again provide suitable nesting habitat for the grebes. This breeding season on Eagle Lake has not yet been evaluated due to issues coordinating a census (census scheduled for Oct 18, 2018).

#### *Lake Almanor*

The total number of adults on Lake Almanor (Table 1) was lower than the past six previous years (4,293 average adult census, averaged across 2012-17). Peak nest numbers were similar to the previous two years, but less than half of what the numbers were in 2013-2015. The number of adults and nests at Lake Almanor seem to somewhat correlate with whether there is nesting at Eagle Lake (Figure 1). The number of adult grebes and nests at Lake Almanor shot up from previous numbers during the same timeframe that Eagle Lake had zero nesting (2012-2016). Since then, in the last two

years with Eagle Lake once again providing breeding habitat, numbers of adults and nests on Lake Almanor have dropped from those observed during previous peak years (2013-2015).



**Figure 1.** Peak nest counts at Eagle Lake and Lake Almanor, 2010-2018.

#### *Lake Davis*

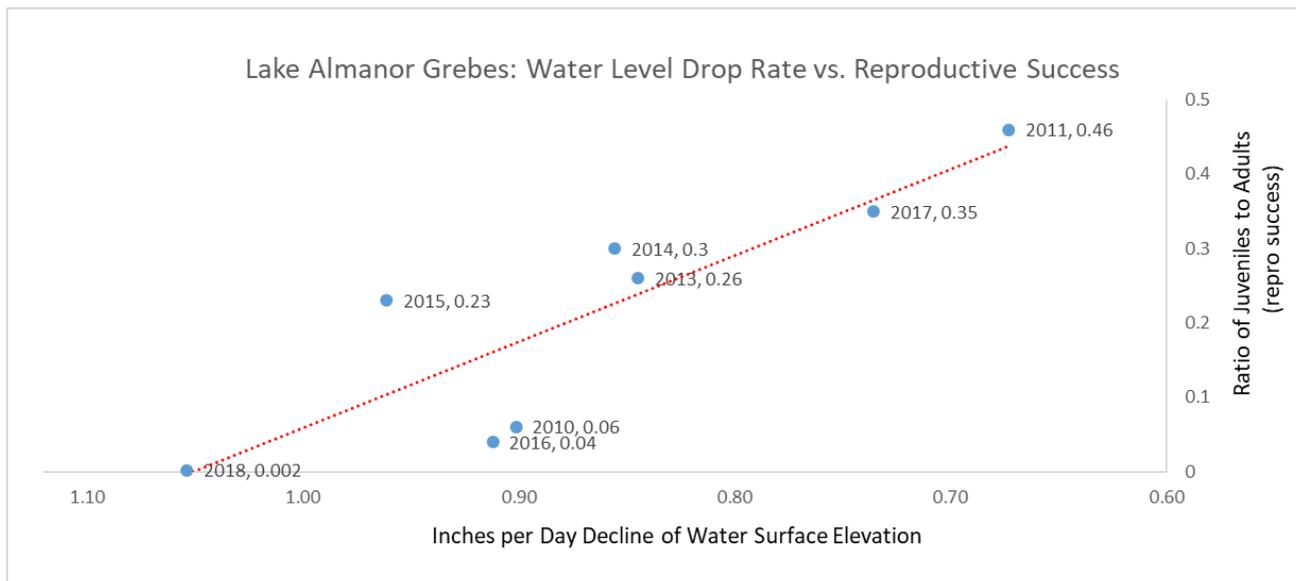
Lake Davis surveys were not completed due to the imbalance of survey effort to data produced. Past years efforts produced very little usable data at Lake Davis, and with a dwindling budget it was decided that survey effort was better spent at Lake Almanor where the data produced is more likely to impact resource management decisions that can, in turn, positively impact future grebe reproductive success.

#### *Antelope Lake*

Antelope Lake had more adult grebes but produced fewer young than average of the previous reproductive years during this study (Table 1).

#### Reproductive Success on Lake Almanor, 2018

*Aechmophorus* grebe reproduction was almost a complete failure at Lake Almanor this year with the loss of almost an entire generation of *Aechmophorus* grebes on the lake. The lowest reproductive success (0.002) and the highest water level drop rates (average of -1.08 in/day, June 25 – Sept 30) of the study were observed this nesting season (Figure 2).



**Figure 2.** Graph depicting the relationship between *Aechmorrhous* grebe reproductive success and water level drop rate at Lake Almanor.

*Aechmorrhous* grebes attempted nesting at Lake Almanor at various locations (Table 2), though water level drop rates were not in the grebe’s favor. During the beginning of the breeding season the water level drop rate at Lake Almanor was low and conducive to a successful breeding season (average of -0.53 in/day, June 25 - July 27). It is not uncommon to observe small colonies of nesting grebes form and dissolve in the early parts of the breeding season. In Table 2 each of the three surveys where grebes were observed nesting in Chester Meadows South were in different locations, meaning each of these independent colonies were rather quick nesting attempts and failures without much colony recruitment. It is unlikely that many, if any, of these nests were successful.

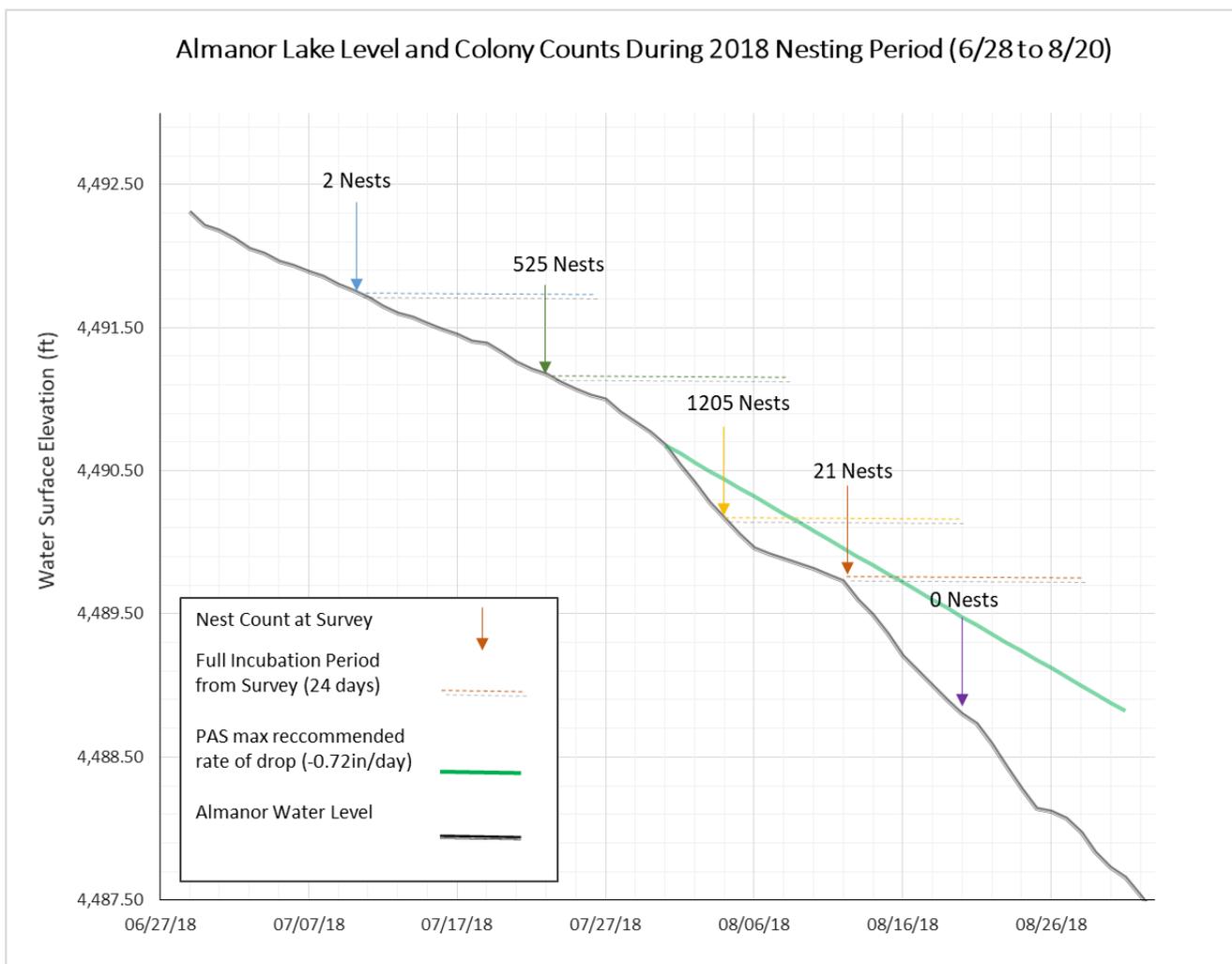
**Table 2.** Colony Progression: Nest counts by colony at Lake Almanor in 2018.

Colony	28-Jun	3-Jul	10-Jul	23-Jul	4-Aug	13-Aug	20-Aug	24-Aug	6-Sep	Peak
Chester Meadows South	0	5	20	33	0	0	0	0	0	<b>33</b>
Chester Meadows North	0	0	0	0	0	0	0	0	0	<b>0</b>
Causeway	0	0	2	549	1205	21	0	0	0	<b>1205</b>
North of Causeway	5	8	6	6	7	5	2	-	0	<b>8</b>
Goose Bay	0	0	0	0	0	0	1	0	0	<b>1</b>
<b>Totals</b>	<b>5</b>	<b>13</b>	<b>28</b>	<b>588</b>	<b>1212</b>	<b>26</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1247</b>

The nesting colony near the Causeway at Lake Almanor showed promise with high numbers and steady growth during the middle of the breeding season. Water level drop rates were slower than the PAS recommended maximum rate (-0.72 in/day) until the end of July (-0.53 in/day, June 25-July 27),

but then nearly doubled the maximum recommended rate (-1.32 in/day, July 28-Sept 30) until the end of active nesting in this colony.

Peak nesting occurred around August 3 at which point 1,205 active nests were observed in the colony. Ten days later the colony was found to have been almost entirely abandoned with many nests stranded on land and extensive egg depredation was evident (Figure 3). By August 20, no active nests were observed and a lake-wide census survey on that date recorded 3,485 adult *Aechmophorus* grebes and only 3 young (informal observations from subsequent boat tours during the Grebe Festival, Aug. 24-26, estimated 15 young on the lake). During peak nesting the water level drop rate was -1.44 in/day.



**Figure 3.** Water Surface Elevation of Lake Almanor with colony counts highlighted.



*Top:* Lake Almanor Causeway colony near its peak on August 1, 2018. Photo credit: Suzanne McDonald  
*Bottom:* Lake Almanor Causeway colony abandoned as observed on August 14, 2018. Photo credit: Suzanne McDonald



Following the causeway colony collapse only a single new nest was observed at Goose Bay (August 20) and soon after abandoned (August 24).

There was some successful breeding observed on the north side of the causeway. Nest numbers are reported in Table 2 (peak no. of nests: 8) and the breeding success was high (0.50), but total numbers of adults and juveniles on the north side of the causeway was low (ave. no. of adults: 20; est. no. of young: 10). Data from the north side of the causeway has not been included in the full lake's reported breeding success ratio because: 1) this area is physically separated from the rest of the lake, 2) this area does not experience the water level dynamics the same as the rest of the lake, and 3) this is only the second year of this study (2017 being the first) that any nesting was observed on the north side of the causeway and so was not part of any prior analyses.

Breeding success in 2018 at Lake Almanor in terms of peak ratio of juveniles to adults was 0.002; the lowest we have seen in the nine-year history of this study.

### Water Management and Nest Success at Lake Almanor

While other factors such as water surface elevation, wind, human disturbance, predation of eggs and adults, habitat availability, and fish prey population all influence *Aechmophorus* grebe population size, number of nests, and reproductive success to various degrees each year, the most important, consistent, and influential factor on *Aechmophorus* grebe reproductive success on Lake Almanor is the rate of water level drop during their nesting period.

PG&E finds the strategy of keeping water level drop rates below the initial recommendation of -0.72 in/day nearly impossible with energy supply obligations and other operational constraints and complexities. To make water management changes more feasible, PAS subsequently recommended an interim goal of water level drop rates of no faster than 0.84 in/day from July 1 through August 31. This updated interim recommendation has not been followed in the years since (2017 and 2018).

A management strategy that includes water holding events, such as those in 2017 (see 2017 report), during the grebe nesting season, may result in more consistent reproductive success on Almanor in the future. This strategy alone will not maximize the potential success of grebe reproduction on Lake Almanor as effectively as keeping the water level drop rate at or slower than the initial recommended maximum rate of -0.72in/day or the revised recommendation of -0.84in/day. However, waves of breeding colonies may still be more likely to succeed with water holding events moderating the average water level drop rate during incubation periods. While we continue to maintain our recommendation of maximum water level drop rate during peak breeding season, regular water holding events (eg. at 3-5 week intervals for periods of 3-5 days) between June 25 and September 15 may be a more feasible management strategy for PG&E to implement to benefit grebe conservation efforts at such an important breeding ground as is Lake Almanor.



*Above:* Grebe egg abandoned on nest, observed on August 13, 2018. Photo credit: Brad Graevs

**Appendix A.** Photographs highlighting the many activities at the 2018 Grebe Festival.



*Top:* Chester Elementary 5<sup>th</sup> graders play the grebe ring toss and grebe race games.

*Bottom:* Chester Elementary 5<sup>th</sup> graders go on a bird walk with Grebe Festival volunteers.





*Top:* Chester Elementary 5<sup>th</sup> graders listen to a presentation on Western and Clark's Grebes.  
*Bottom:* Chester Elementary 5<sup>th</sup> graders spotting grebes, Osprey, and a Bald Eagle with a Grebe Festival volunteer.





Two new workshops at this year's festival:

*Top:* How to Paint a Grebe workshop.

*Bottom:* Wildlife Stamp Carving workshop.





*Top:* Festival participants and the general public join us along the causeway for free scoping from shore.  
*Bottom:* Trip leader, Kathy Biggs, and participants with an interesting find during the Dragonfly Odeing at Willow Lake trip.





*Top:* Festival participants listen for the prize drawing winner names during the social mixer.  
*Bottom:* Local band, Stone & Straw, play during the Saturday evening social mixer.





*Top:* Maidu elder, Lorena Gorbet, shares the story of getting Maidu ancestral land (Tásmam Kojóm/Humbug Valley) back under the care and stewardship of Maidu people.

*Bottom:* Shelton Douthit, Executive Director of Feather River Land Trust, discusses conserving the land through the land trust's acquisitions and management.



