Broc Zoller
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January 17, 2023

Lake County Board of Supervisors
255 N. Forbes St.
Lakeport, CA 95453

Re: Memo 23-19 (1-10-2023, postponed until 1-24-2023),
Discussion of Clear Lake Hitch Future

Dear Chairwoman Pyska and Supervisors,

Thank you for considering these comments in your discussion of Memo 23-19, Consideration of Proclamation Declaring the Existence of a Local Emergency Due to Persistent Drought, Habitat Loss and Potential Extinction of Clear Lake Hitch. I remember seeing large spawning schools of Hitch in Kelsey Creek near Dorn Crossing and in Adobe Creek north of Finley East Road in some spawning seasons of the 1970's-1990's. There were even some Hitch seen in flooded low areas of a few pear orchards near Adobe Creek in some of those years. Since then, spawning numbers have seemed lower. The Kelsey Creek detention structure north of Dorn Crossing probably needs fish ladder improvement to prevent this from being a factor in this creek keeping as many fish from spawning south to the Kelsey Creek bridge as in the past. This bridge (dating back to the 1940's?) also seems to be a barrier, since we have never seen Hitch in Kelsey Creek at the property line east of our home on Kelsey Creek Drive.

Attached in Figure 1 are Kelseyville rainfall records from 1935 to the present together with 4 Hitch cited records of observation (which your communications to us have allowed us to find on line) by (1) commercial fishermen (1961-2001), (2) Lake County Vector Control District [LCVCD] beach seine data (1987-2010), (3) Chi Council visual counts [CCCLH] (2005-2013), and (4) California Fish and Wildlife visual counts [CFW] (2014-2022). Although these observations were made in different manners, if each group is considered separately, they all seem to indicate that the Hitch population is cyclic, with ups and downs. In some cases, such as the extreme droughts in 1976-1977 and 2020-2021, lack of rainfall seemed to be associated with low observation counts.

However, there are many other reasons for the Hitch population declines, such as (1) the introduction of Silversides for Clear Lake Gnat control, thereby placing extreme competition for food on the Hitch, which also ate the gnats. (In the 70's and 80's, the City of Lakeport on summer nights was an uncomfortable cloud of gnats attracted to the lights, but the gnats are no longer an issue); (2) the population increase of Large Mouth Bass, which can consume very many Hitch (Clear Lake has become famous as one of the best Bass-fishing locations in the US); (3) the accidental introduction of other bait fish that compete for plankton food sources used by the Hitch; (4) periodic extreme populations of predator birds such as Pelicans **(see attached photo of Pelicans taken on Clear Lake at the mouth of Kelsey Creek on 10-20-2013** (which was another year of very low Hitch numbers. Pelicans can consume 2-4 lb of fish per bird each day).

In my experience, together with the consideration of these observations and data, it does not seem that an extinction emergency exists for the Hitch, only that their population numbers show normal ups and downs in response to conditions in the lake. The drought appears to be cycling back to more rainfall, and we can expect the Hitch population to start back up, also. The population, however, seems likely to not reach the high levels of the past, before the described competitions developed, unless something occurs to reduce this competition.

There seems to be continuing effort to pin a Hitch population decline on lowering of creek flows from pumping by farmers during the spawning season. **Attached in Figure 2** is a 100 year record of Bartlett Pear Full Bloom in the Kelseyville area 1923-2022. Full bloom is used as a rule-of-thumb to begin protection of pear crop sensitivity to frost conditions. The average Full Bloom date for the 100 year period is April 5. Frost episodes, as they may occur, are often from this date to about May 5. A typical number is 6-10 episodes/year. Typical protection is needed for about 6 hours, but this

can very. Although many of these episodes are totally handled by wind machine use, and not water, this is not enough water use to be affecting creek flow at this time of the year. The pear acreage has also diminished in all Lake County from about 5000 acres in the early ‘70’s to about 1500 acres, now.

In the case of water use for vineyard frost control in the valley areas, water use is similar, but the frost season begins at least a couple of weeks after pear full bloom, since grapes emerge later. Fewer episodes are thus encountered. In hillside vineyards, many of which are obtaining water outside zones linked to Clear Lake tributaries, acreage has increased, but the general situation is for warmer than valley conditions, not requiring frost protection, anyway.

Sincerely,

Broc Zoller, Ph.D.

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Lake County resident and farmer since 1978
Wine Grapes, Pears and Walnuts
Agricultural Pest Control Advisor in Lake County since 1972

Pelicans at the Mouth of Kelsey Creek 10-20-2013:

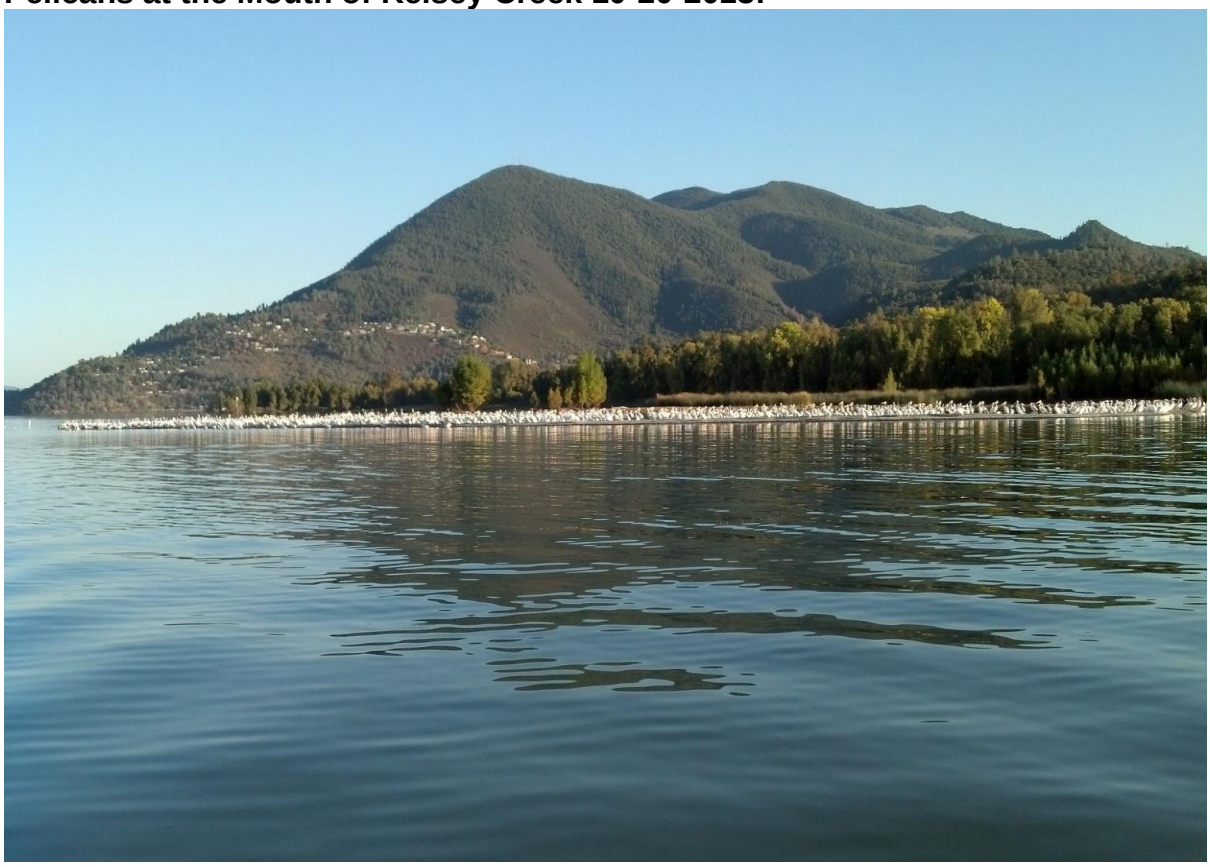

Figure 1. **Kelseyville Rainfall 1935-2023**
Clear Lake Hitch Counts as reported in 4 sources:

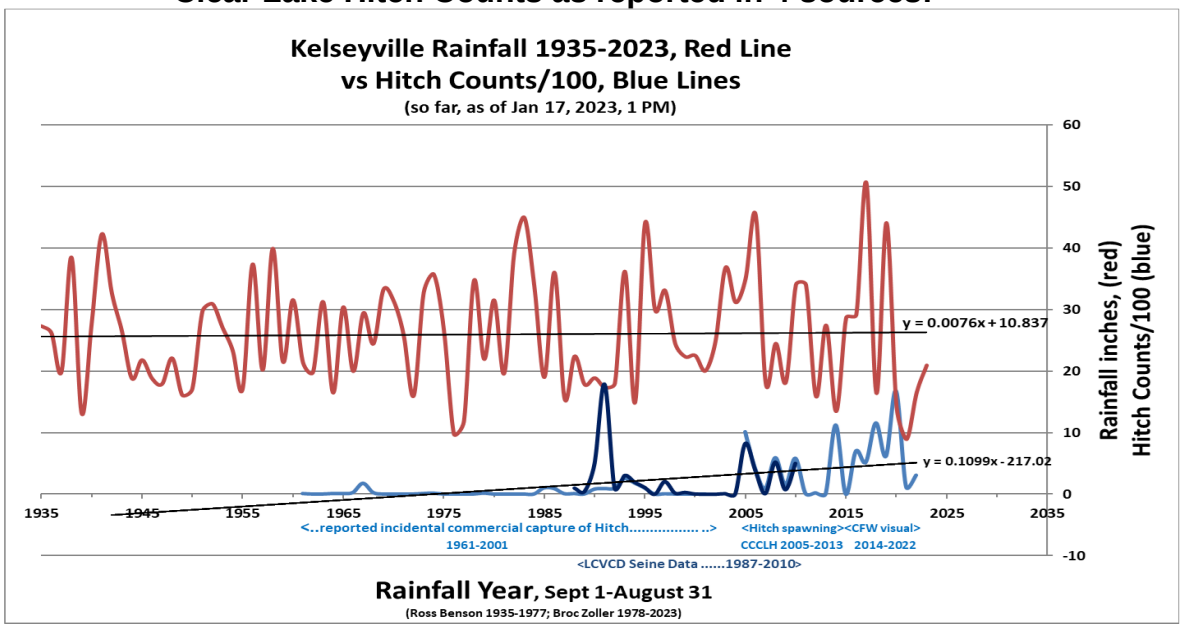

Figure 2. **Kelseyville Bartlett Pear Full Bloom 1923-2022:**