

Clear Lake Hitch Emergency

Division of Water Rights

State Water Resources Control Board



State Water Board Meeting | March 7, 2023



Clear Lake Hitch, “*Chi*” Panel

- Ron Montez Sr., Big Valley Band of Pomo Indians
- Wade Crowfoot, California Natural Resources Agency
- Felipe La Luz, California Department of Fish and Wildlife
- Christine Birdsong, California Department of Food and Agriculture
- Will Weiss, Lake County Land Stewards
- Rebecca Harper, Lake County Farm Bureau
- Karola Kennedy and Luis Santana, Robinson Rancheria of Pomo Indians
- Sarah Ryan, Big Valley Band of Pomo Indians



Clear Lake Hitch

- **State Water Resources Control Board Meeting**
March 7th, 2023
Felipe La Luz
California Department of Fish and Wildlife



Species Overview

- Clear Lake Hitch (*Lavinia exilicauda chi*)
- CESA – Listed as threatened August 6, 2014
- Endemic to Clear Lake and its tributaries.
- Historically supported subsistence fishery
- Culturally important





Life History

- Can reach length of 14 inches
- 6-year lifespan
 - Females mature in 2nd or 3rd year, males mature in 1st year.
 - ~ 36,000 eggs/year
- Juveniles rear near shore and in tributaries
- Adults occupying deeper water
- Feed on small invertebrates (e.g., Chironomids, Daphnia)



Spawning Requirements

- February through May or June
- Spawn over shallow, clean gravel primarily in tributaries
- Wetlands when available (Robinson Rancheria EC 2011)
- Some spawning occurs in the lake
 - (Kimsey 1960, Feyrer 2019)
 - limited due to egg predation and desiccation



Photo by R. Macedo CDFW



Population Trends

- “...common and the most abundant fish in Clear Lake during late 19th and early 20th centuries.”
- Runs could consist of tens of thousands of Clear Lake Hitch and Clear Lake Splittail (Lindquist et al. 1943)

State of California
Natural Resources Agency
Department of Fish and Wildlife

REPORT TO THE FISH AND GAME COMMISSION

A STATUS REVIEW OF CLEAR LAKE HITCH (*Lavinia exilicauda chi*)

May 2014



Clear Lake hitch adult. Photo courtesy of Rick Macedo

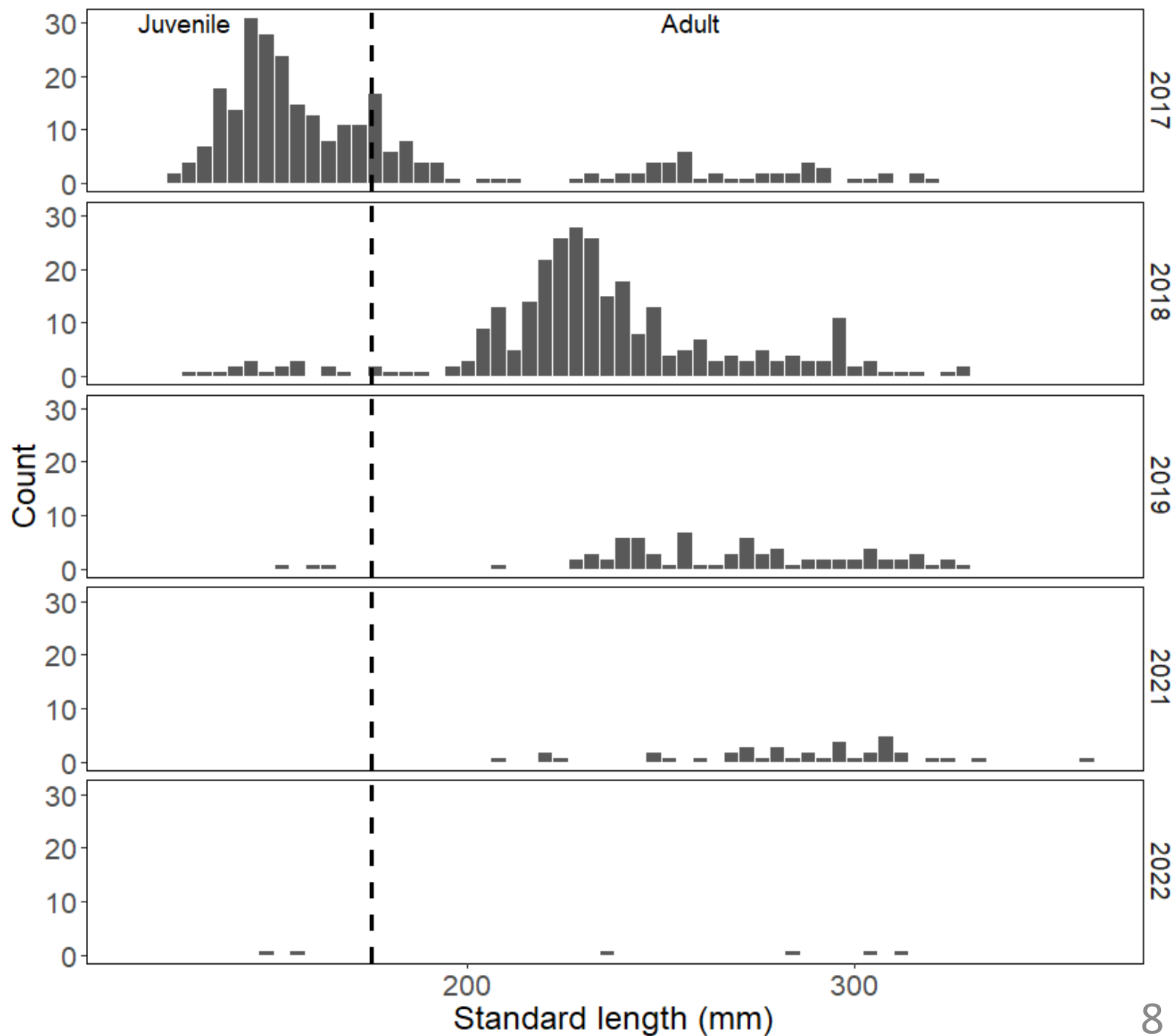
Charlton H. Bonham, Director
California Department of Fish and Wildlife



Report to the Fish and Game Commission
A STATUS REVIEW OF CLEAR LAKE HITCH



- Length Frequency Plot of USGS Summer Gill Net Survey (F. Feyrer)
- Juveniles are not recruiting to the population.
- Steinke et al., 2018, (ver. 4.0, December 2022): U.S. Geological Survey data release, <https://doi.org/10.5066/P9A03OI6>.





CDFW Visual Spawning Survey

- 21 fixed sites across seven streams in Big Valley
- 2020 – Began reporting dry streams

Year	Number
2014	1,119
2016	693
2017	517
2018	1153
2019	612
2020	1672
2021	120
2022	306

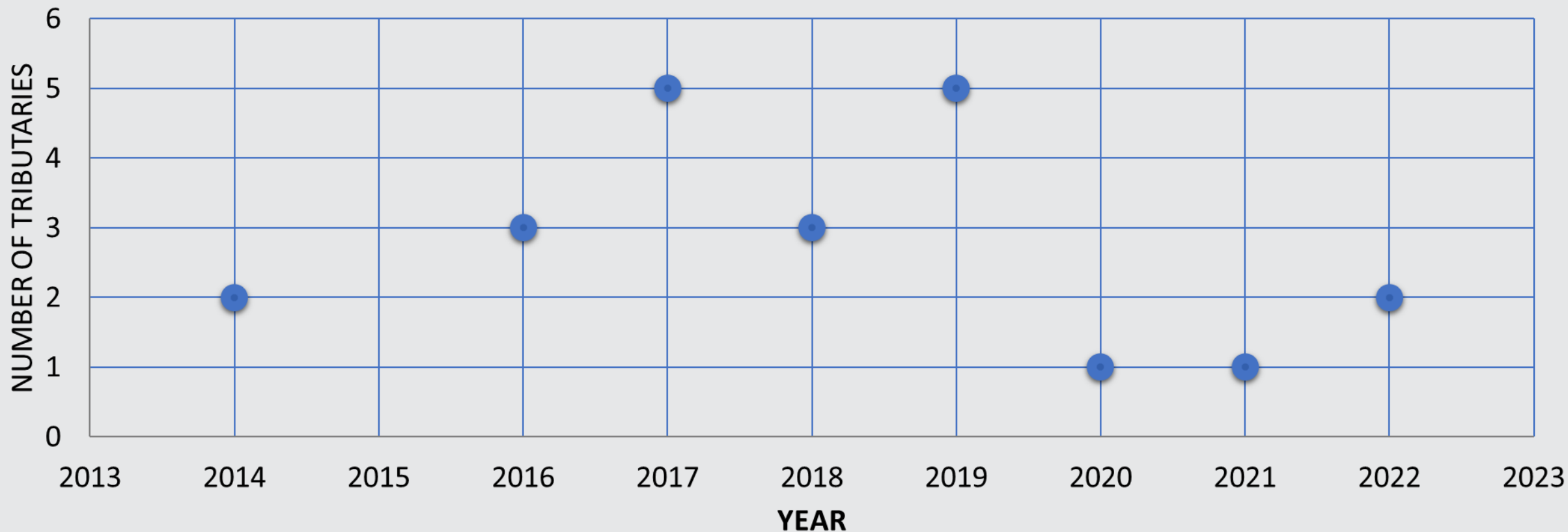


Map Data ©2022 Google



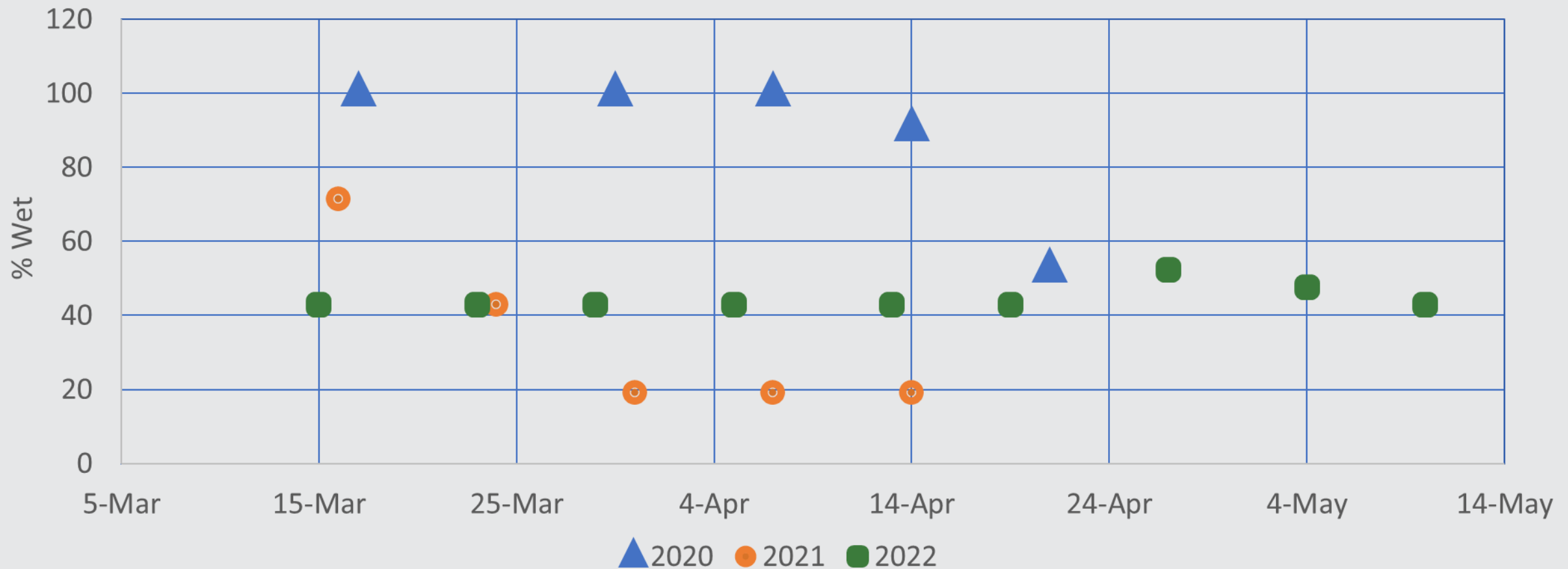
Visual Survey Results – Tributaries

Spawning is observed in more tributaries in exceptionally wet years (2017, 2019).





Visual Survey Results – Adequate Flow





Fish Rescue – Adobe Creek

Photos by L. Santana

May 4th, 2022



May 16th, 2022





Factors Affecting Decline

- Loss of Spawning and Rearing Habitat
 - Estimated 92% loss of historically available habitat due to physical barriers (CDFW 2014 Status Review)
 - Infrastructure, non-native vegetation, gravel/sediment bars
- Strandings and desiccation of adults, eggs, and juveniles
- Adobe Creek 3/25/2014



Photo by S. Newton



Factors Affecting Decline Continued

- Habitat Quality
- Non-native species competition and predation.
- Water Quality/Contaminants
- Disease/parasites



Photos By CDFW



Conclusion

- Rapid population decline
- Near complete juvenile recruitment failure in recent years
- No single entity has the power or authority to solve these issues
- Agencies are coordinating with Tribes and each other
 - Watershed Reconnaissance
 - Outreach
 - Research, Restoration, Rescues, and Monitoring



Thank you



Photo By B. Ewing CDFW

- Felipe La Luz
- Felipe.laluz@wildlife.ca.gov



Christine Birdsong

Undersecretary

California Department of Food and Agriculture

LAKE COUNTY LAND STEWARDS CLEAR LAKE HITCH CONSERVATION PLAN

- Background and Statement of Intent
- Water Resource Use Impact Data Collection
- Well-Level Monitoring Instruments
- Stream-Level Monitoring Instruments
- Expert Third-Party Technical Consultation
- Voluntary Frost Protection Reporting Pilot Program
- Outreach
- Exploratory Research Efforts
- Streambed Management- Barrier ID and Removal
- Pumpbacks and Other Coordinated, Proactive Options

CLEAR LAKE HITCH EMERGENCY SUPPORT

- Outreach to Broader Grower Groups
- Encourage and Promote Ongoing Data Collection Efforts
- Work With State & Federal Agencies To:
 - Identify Data Gaps and Engage Growers
 - Develop and Manage Barrier Removal Programs
 - Secure Funding Sources Needed for Long Term Program Management



Assessing the Clear Lake Hitch and its Habitat Needs

Luis Santana

Fisheries Biologist

Robinson Rancheria

Historically Abundant

The “Hitch” or “Chigh” – *Lavinia exilicauda*, Baird and Girard.

The most abundant fish in all these lakes, including Blue Lakes. They run up all the creeks, entering from the lakes in March, spawning in the shallow riffles. They are then so abundant that one can hardly step without stepping on several. They are excellent eating and people should be encouraged to use more of them.



Important for Native People

Four Historic Fish Runs

- Suckers (trapped)
- Pikeminnow (speared)
- Hitch and splittail (hand & trap)

Food

- Dried and salted
- Year-long supply

Trade with coastal tribes

- Seaweed
- Abalone
- Beads



Habitat Loss

- Lack of water in streams
 - Clear Lake Splittail extinction due to lack of spawning habitat in streams and out-competed by invasive species in the lake
 - Due to irrigation and diversion causing streams to go dryer sooner in the Spring
 - Clear Lake Hitch strandings in March and April during droughts
 - Agriculture-use likely cause
- Lack of cover in streams and lake
 - Rearing habitat structure LWD almost non-existent in Lake at low levels
 - Riparian/wetland habitat mostly loss
 - At least 70% wetlands around the lake are gone, used as nursery by CLH and all other fishes
 - Riparian habitat has diminished by at least 85% around the watershed
 - 130,000 of pollen study, shows oaks as most dominant

What tribes are already working on

- Creek population assessments
- PIT Tagging
- Water Quality Monitoring
- Habitat Assessments
- Spawner Surveys
- Invasive Species Management

Robinson Specific

- Habitat Assessments
- Population assessment in streams
 - Seining and Backpack- electrofishing
- Restoration Efforts
 - Robinson Creek and Clover Creek
- Fish Rescues
- Tule re-planting
- Carp Management



BAY AREA

At California's second biggest lake, the latest fallout of drought is gruesome



Kurtis Alexander

May 6, 2022 | Updated: May 6, 2022 8:47 p.m.



AT&T fiber

State, local and tribal officials partner to rescue stranded Clear Lake hitch

ELIZABETH LARSON POSTED ON SATURDAY, 30 APRIL 2022 05:01

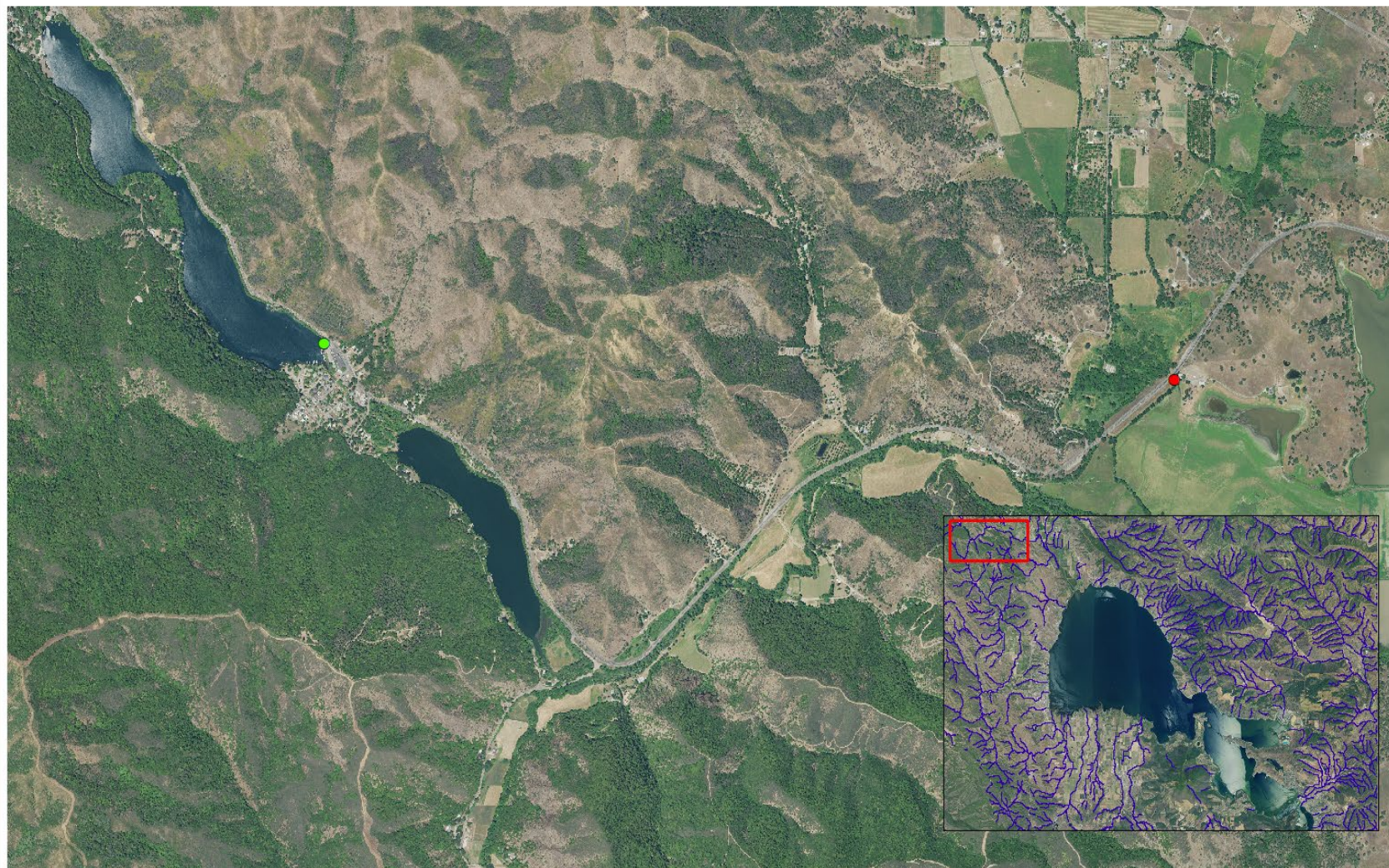


30 APRIL 2022



Lake County News





**Clear Lake Hitch Rescue
August 2022**

- Rescue
- Translocation

0 550 1,100 2,200 3,300 4,400
Feet 1 in = 1,398 ft



August 10th, 2022

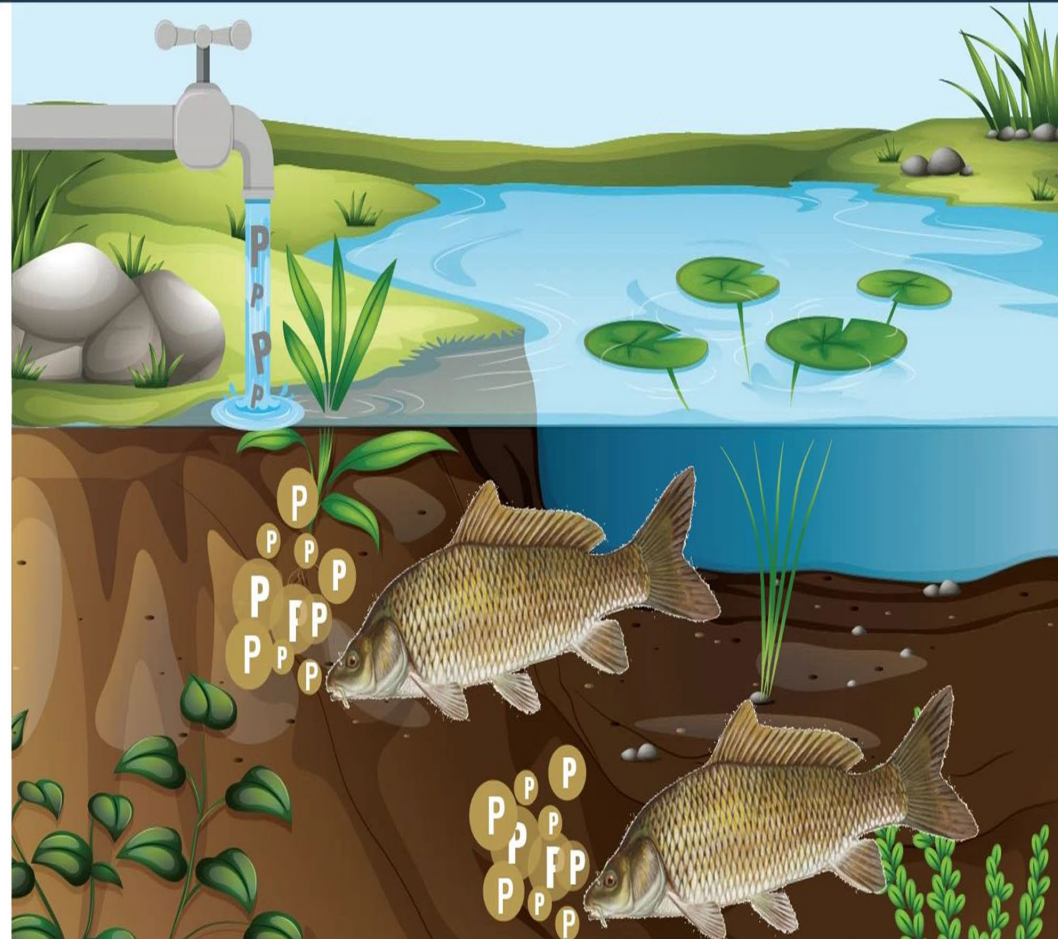
Robinson Rancheria
Environmental Center, Fisheries

Carp Profile



- Tolerant of a wide range of environments (physical, chemical, and biological)
- Long lived
- Easily out-compete native species like the Clear Lake Hitch.
- Very aggressive and territorial when they reach a certain size
 - We tagged a 46 lbs female.
 - 5-10lbs females can produce 100,000-500,000 eggs
- Uproot vegetation easily while foraging for food or during spawn.
 - Vegetation cannot uptake excess nutrients, causing poorer water quality
- Stir up sediments that would otherwise be stationary causing spikes in turbidity
 - In Clear Lake this could mean mercury.
- Benthic macro and micro-invertebrates start going extinct due to overexploitation by carp and goldfish.
- Many studies show once carp are removed water quality improves

Carp Impacts- Water Quality



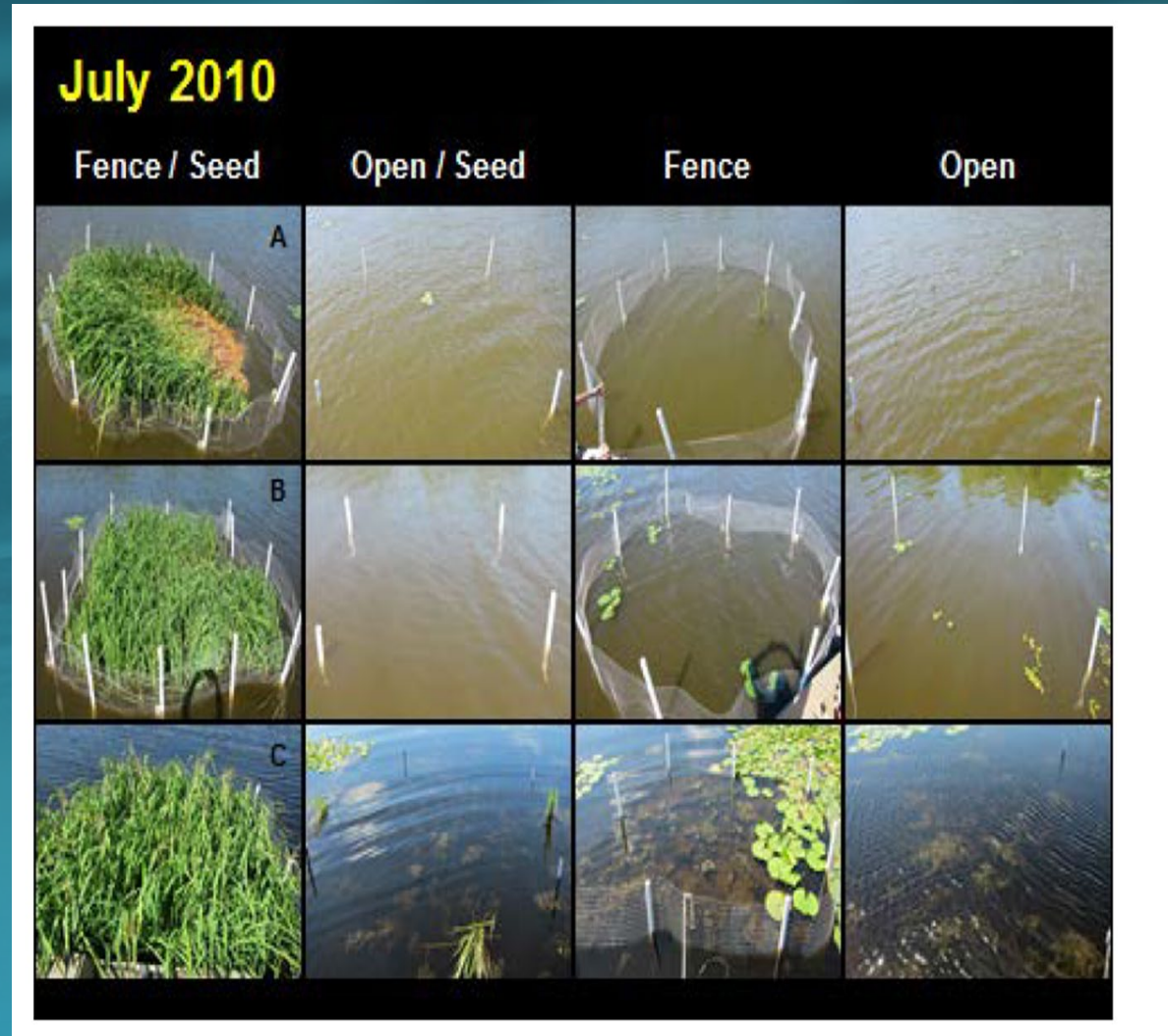
- Increase in internal P loading through excretion and foraging/spawning behavior (bioturbation)
- Leads to decrease in secchi depth and an increase in Chl-a
- Amplified in shallow lakes

Carp Impacts- Vegetation

- Negative relationship between macrophyte abundance and carp biomass
- Elevated carp biomass (~398 lbs/acre) resulted in a loss of 71% of northern wild rice distribution on Clam Lake, Burnett County, WI in 2 years (Havranek, unpublished)

Wild Rice Experiment

- Fence/Seed
 - Carp are kept out by fence, seed was planted.
- Open/Seed
 - Seeded, Carp allowed to move in and out freely.
- Fence
 - No seed planted but carp kept out.
- Open
 - No seed or fence



Carp Impacts- Fishery

- Reduction in habitat (plants) and food (macroinvertebrates) can result in reduced native fishes abundance, diversity, and size structure
- Weber & Brown (2011) found an inverse relationship between relative abundance (CPUE) of native fishes and common carp across 81 lakes in SD; specifically black crappie, bluegill, white bass, and northern pike.

Carp Impacts-Clear Lake Fishery

- CPUE for Carp and Goldfish on Clear Lake not established.
 - Above 89lbs/acre is ecologically damaging
 - We chose to complete the abundance estimate using a boat electrofishing catch per unit effort (CPUE) model
- Tagging Carp and Goldfish
 - Goal: tag 30 specimens
 - Follow them seasonally to see where they congregate
 - Net them out pre-spawn when they seasonally congregate
 - Put in net pens
 - Manage the Carp and Goldfish fishery as long as it is needed

$$\text{Density/hectare} = 4.71 * \text{Carp captured per hour} + 3.04$$

Equation 1: Electrofishing catch per unit effort (CPUE) equation of estimating density of Carp within a basin.

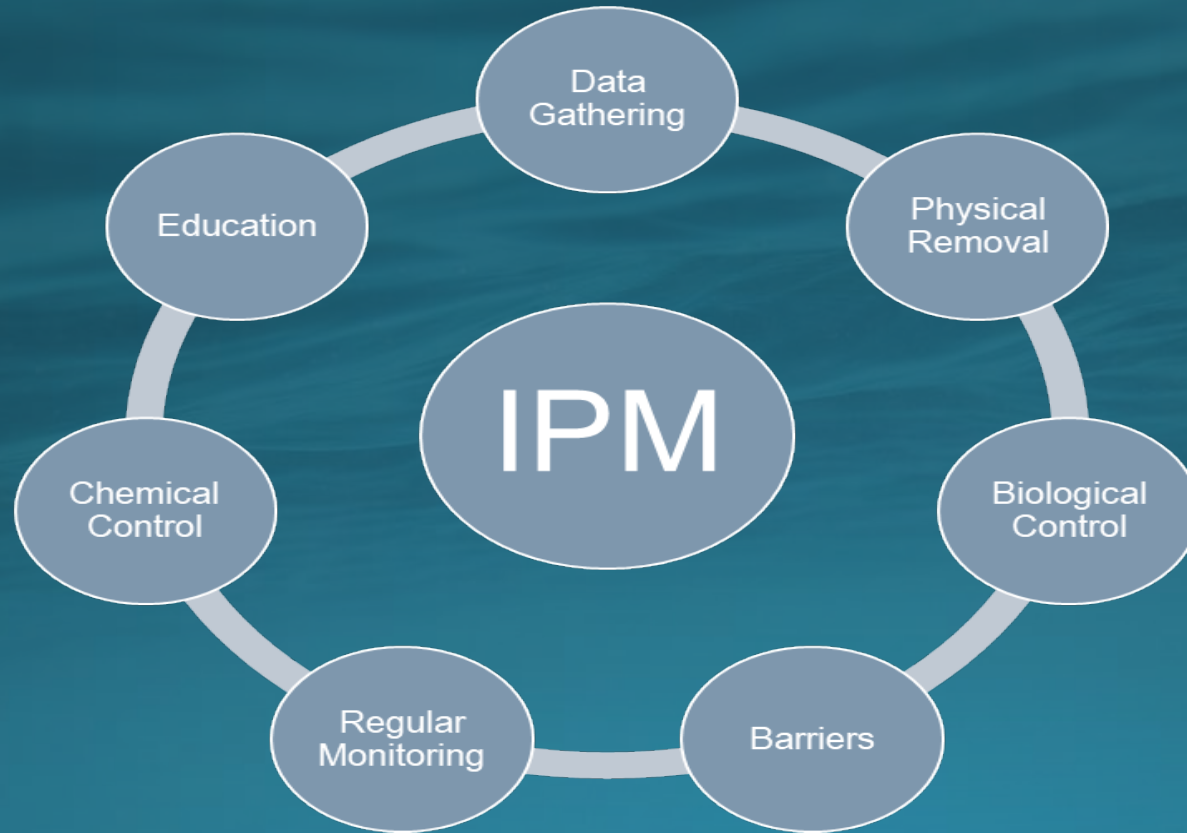
Table 1: Catch per unit effort (CPUE) comparison of electrofishing and gill netting.

Species	Electrofishing (fish/hour)	Gill nets (fish/net set)
Carp	4.80	0.67
Goldfish	11.10	0.00
Sacramento sucker	--	6.50
Largemouth Bass	--	4.00
Sacramento blackfish	--	1.50
Black crappie	--	2.00
Channel catfish	--	0.67

Table 2: Abundance estimate and biomass density estimate based on electrofishing CPUE averaged over all field days.

Species	Population estimate (individuals)	Biomass estimate (pounds/acre)
Carp	396,840 ± 283,505	172.8 ± 214
Goldfish	928,568 ± 335,531	64.9 ± 104

Control methods for carp using integrated pest management (IPM)



First Steps Complete

- Caught carp with gill nets and electro-fishing boat
- Collaboration with Lake County Water Resources, CDFW, WSB, and Big Valley Rancheria
- Tagging of Carp
- Telemetry training complete.
 - Know their winter foraging areas for easy eradication.



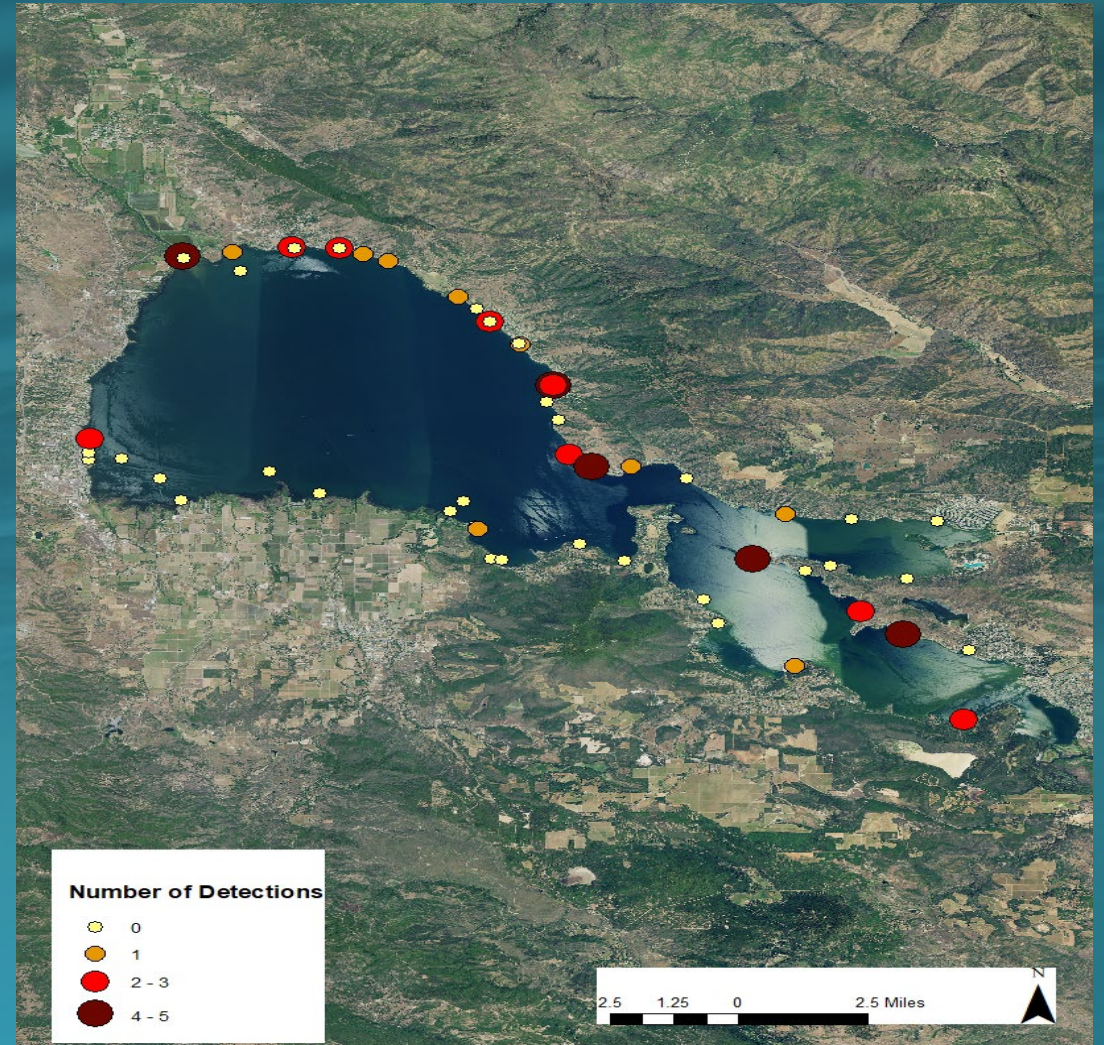
Understanding the Carp's use of a system- Through Radio Telemetry



1. Identify Winter Aggregations
2. Identify Migration Routes
3. Identify Potential Barrier Locations
4. Understand spawning preferences

Congregating Behaviors

- They have predictable foraging and spawning behaviors
- Eradication would take place in winter months where they typically congregate together



Quantify the carp Population

- We know where they are, now how many are there?
- Use mark/recapture methodology to develop a population estimate along with confidence interval-What is the range? Recap rate important.

- 1) Develop an understanding of carp spatial distribution throughout the year
- 2) Quantify carp population in terms of abundance (how many) and density (biomass/acre)
- 3) Remove biomass
- 4) Data Collection on Vegetation and Water Quality

Making This Project Sustainable

- Continue to Monitor Water Quality
- Survey for Young of Year Carp
- Use electrofishing CPE model
- Complete Fisheries Surveys (Bluegill)
- Aquatic Vegetation Management (Curly Leaf)

Enhancements from removal

- Better water quality
- Harmful sediments removed from system
- More and bigger native and introduced fishes
- Native aquatic vegetation growth which means more habitat for fishes and wildlife

References

- Diggle, J., Patil, J., & Wisniewski, C. (2012). A manual for carp control: The Tasmanian model. PestSmart Toolkit Publication, Invasive Animals Cooperative Research Centre, 32.
- Ewing, B. (2014). 2014 Clear Lake Hitch (*Lavinia exilicauda* chi) Visual Surveys on Clear Lake Tributaries. Retrieved May 16, 2022, from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=89711>
- Ewing, B. (2016). 2016 Clear Lake Hitch (*Lavinia exilicauda* chi) Visual Surveys on Clear Lake Tributaries. Retrieved May 16, 2022, from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=124050>
- Ewing, B. (2017). 2017 Clear Lake Hitch (*Lavinia exilicauda* chi) Visual Surveys on Clear Lake Tributaries. Retrieved May 16, 2022, from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=147076>
- Ewing, B. (2018). 2018 Clear Lake Hitch (*Lavinia exilicauda* chi) Visual Surveys on Clear Lake Tributaries. Retrieved May 16, 2022, from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=162008>
- Ewing, B. (2019). 2019 Clear Lake Hitch (*Lavinia exilicauda* chi) Visual Surveys on Clear Lake Tributaries. Retrieved May 16, 2022, from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=174313>
- Ewing, B. (2020). 2020 Clear Lake Hitch (*Lavinia exilicauda* chi) Visual Surveys on Clear Lake Tributaries. Retrieved May 16, 2022, from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=180441>
- Ewing, B. (2021). 2021 Clear Lake Hitch (*Lavinia exilicauda* chi) Visual Surveys on Clear Lake Tributaries. Retrieved May 16, 2022, from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=193347>
- Feyrer, F. (2019). Observations of the Spawning Ecology of the Imperiled Clear Lake Hitch. *California Fish and Game*, 105(4), 225-232.
- Feyrer, F., Whitman, G., Young, M., & Johnson, R. C. (2019). Strontium isotopes reveal ephemeral streams used for spawning and rearing by an imperilled potamodromous cyprinid clear lake Hitch *Lavinia exilicauda* chi. *Marine and Freshwater Research*, 70(12), 1689-1697. doi:10.1071/mf18264
- Feyrer, F., Young, M., Patton, O., & Ayers, D. (2019). Dissolved oxygen controls summer habitat of Clear Lake hitch (*Lavinia exilicauda* chi), an imperilled potamodromous cyprinid. *Ecology of Freshwater Fish*, 29(2), 188-196. doi:10.1111/eff.12505
- Geary, R. E., & Moyle, P. B. (1980). Aspects of the ecology of the hitch, *Lavinia exilicauda* (Cyprinidae), a persistent native cyprinid in Clear Lake, California. *The Southwestern Naturalist*, 25(3), 385-390. doi:10.2307/3670695
- Gobalet, K. W. (1989). Remains of Tiny Fish from a Late Prehistoric Pomo Site Near Clear Lake, Ca. *Journal of California and Great Basin Anthropology*, 11, 2nd ser., 231-239.
- McLendon, S. (1977). *Ethnographic and Historical Sketch of the Eastern Pomo and their Neighbor, the Southeastern Pomo* (Doctoral dissertation, University of California, Berkeley, 1977) (pp. 1-64). Berkeley, CA: University of California Department of Anthropology.
- Thompson, L., Giusti, G. A., Weber, K. L., & Keiffer, R. F. (2013). The native and introduced fishes of Clear Lake: A review of the past to assist with decisions of the future. *California Fish and Game*, 99(1), 7-41. doi:file:///C:/Users/lsant/Downloads/Pages%20from%2099-1%20Fishes%20of%20clear%20lake%20Page%207-41.pdf
- Young, M. J., Larwood, V., Clause, J. K., Bell-Tilcock, M., Whitman, G., Johnson, R., & Feyrer, F. (2022). Eye lenses reveal ontogenetic trophic and habitat shifts in an imperiled fish, clear lake hitch (*Lavinia exilicauda* chi). *Canadian Journal of Fisheries and Aquatic Sciences*, 79(1), 21-30. doi:10.1139/cjfas-2020-0318
- WSB. (2016). WSB/Chippewa Indians of St. Croix. 2016. Common Carp Research/Mitigation and Wild Rice Restoration. WSB. Minneapolis, Minnesota: WSB
- Zambrano, L., Scheffer, M., & Martínez-Ramos, M. (2001). Catastrophic response of lakes to benthivorous fish introduction. *Oikos*, 94(2), 344-350. doi:10.1034/j.1600-0706.2001.940215.x



No More Loss of Species on Our Watch



Actions to Protect the Chi and Ongoing Needs
State Water Resources Control Board

3/7/23

Tribal Long Term Tribal Action to Protect the Hitch/Chi

- Studies
 - Water quality
 - Fish tissue
 - Habitat
 - Tagging
 - Observations
- Communications to agencies
- Collaborations
- Reporting of violations
- Requests for assistance
- Participation in hitch rescues



Seasonal creek



Adobe -Soda Bay Road



Kelsey



Cole-Soda Bay Road



Cole- Clark bridge



Adobe- Bell Hill

19 Pages of Tribal Projects Draft Conservation Strategy

2.6 Population Trends..... 22

Chapter 3. Clear Lake Tribes 27

3.1 Cultural Significance, Traditional Use, and Current Use 27

3.2 Tribal Project Descriptions 29

3.2.1 Big Valley Rancheria of Pomo Indians..... 30

3.2.2 Elem Indian Colony 34

3.2.3 Robinson Rancheria of Pomo Indians..... 36

3.2.4 Scotts Valley Band of Pomo Indians 44

3.2.5 Habematolel of Upper Lake Pomo..... 46

Chapter 4. Threats and On-Going Conservation Actions 49

4.1 Habitat Loss, Degradation, and/or Modification 49

4.1.1 Riparian Vegetation 50

4.1.2 Spawning Habitat..... 51

..... --

Conservation Strategy
for the
Clear Lake Hitch
(*Lavinia exilicauda chi*)



Photo credit: Ben Ewing

Evolution of the Hitch Migration 2012

	4/4/2012	4/12/2012	4/19/2012	4/26/2012	5/3/2012	5/10/2012	5/17/2012	5/24/2012
SEASONAL C	Clear Water/No Hitch	Clear Water/No Hitch	Clear Water/No Hitch	Clear Water/No Hitch	Clear Water/No Hitch	Clear Water/No Hitch	Clear Water/No Hitch	Dry
ADOBE- SB	No Hitch Seen	Dark brown water/No Hitch	150 Hitch seen, 3 fish seen in shallow water	Tagging experiments/ Young Fish seen in water	Young fish seen about 1000	Many Schools of young Hitch-Fish	Many Schools of young Hitch-Fish	Many Schools of young Hitch-Fish
KELSEY- SB	No Hitch Seen/Birds seen	Dark brown water/No Hitch	100 Hitch seen at the Bridge	No fish seen	No Fish	No Fish	Lots of mucilage- 5 young fish seen	Lots of mucilage- few young fish seen
COLE-SB	No Hitch seen	Birds seen/No Hitch	10 Hitch seen by the bridge	No Fish seen	Dirty water/No Fish	No Fish/debris	No Fish/debris	No Fish/debris
COLE- CLARK	Muddy water/ o Hitch Seen	No Hitch Seen, Foam and silt water	No Hitch seen	50 Young fish seen	Young fish seen	Creek dry – Young in pools stranded		
ADOBE-BH	Dead Hitch - 14.5 cm	No Hitch seen, Brown water	20 fish seen. Some dead ones	Young Fish seen. Mature Fish seen going downstream	Young Fish seen	Young Fish seen	Young Fish seen	Creek dry – Young in pools stranded

2012 report to the CalEPA Tribal Advisory Committee

03/16/2012- Sacramento Suckers seen at Adobe – Soda Bay

03/22/2012- Sacramento Suckers seen at Adobe- Soda bay and Finley

•03/23/2012- 2 dead Hitch seen at Adobe – Soda bay



Requests for Information and Assistance

From: Sarah Ryan [<mailto:sryan@big-valley.net>]
Sent: Tuesday, April 09, 2013 5:43 PM
To: [REDACTED]@Waterboards
Cc: [REDACTED]@Waterboards; Mataka, Arsenio@EPA; John Gichuki
Subject: RE: STATUS OF CAL/EPA COMPLAINT # [REDACTED]

Thank you [REDACTED]

Which technology is used at [REDACTED] Road? Do you have a list showing the technology used by each of the water rights permit holders? Or are they on the honor system and if so, does the state ever inspect?

Since the Clear Lake hitch are on the Candidate Species list, and we have noted that it is the water levels in the creeks that strand the fry preventing the population from being replenished, we are very interested in the actual water use in the creeks.

Some additional questions we have are:

- Have the creeks in Lake County been evaluated for whether they are fully appropriated?
- Is the state confident that all water users on each creek have submitted appropriate paperwork and permits?

Thank you for your assistance.

Sarah Ryan, Environmental Director
Environmental Protection Department
Big Valley Rancheria Band of Pomo Indians
2726 Mission Rancheria Road
Lakeport, CA 95453

707-263-5277 x105
707-263-5378 fax
707-349-4040 cell

Tribal Engagement

- Tribal testimony at meetings
- Submittal of information for listings



Mar 6, 2013 · ⚙

We WON!!



👍 20

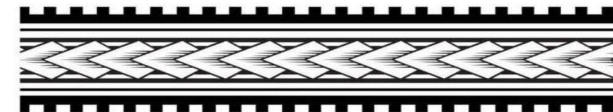
17 comments 2 shares



PROTECT OUR NATIVE FISH - THE CHI “CLEAR LAKE HITCH”

Attend the Fish and Game Commission meeting on October 12, 2022 in Kings Beach or online to show your support for the Clear Lake Hitch and Tribal Co-Management.

Calling all Tribal Members who have a deep connection with the lake and all its inhabitants. Please come speak and show your support for the Native Fish of Clear Lake, the Chi – otherwise known as the Clear Lake Hitch. This is your opportunity to speak to the Fish and Game Commission on how important this Native fish is to not only our ecosystem but also to our people. Please help bring awareness to what is happening to the Hitch and its habitat in Clear Lake.



OCTOBER 12, 2022

NORTH TAHOE
EVENT CENTER
8318 NORTH LAKE
BLVD,
KINGS BEACH, CA
96142

LINK TO AGENDA:

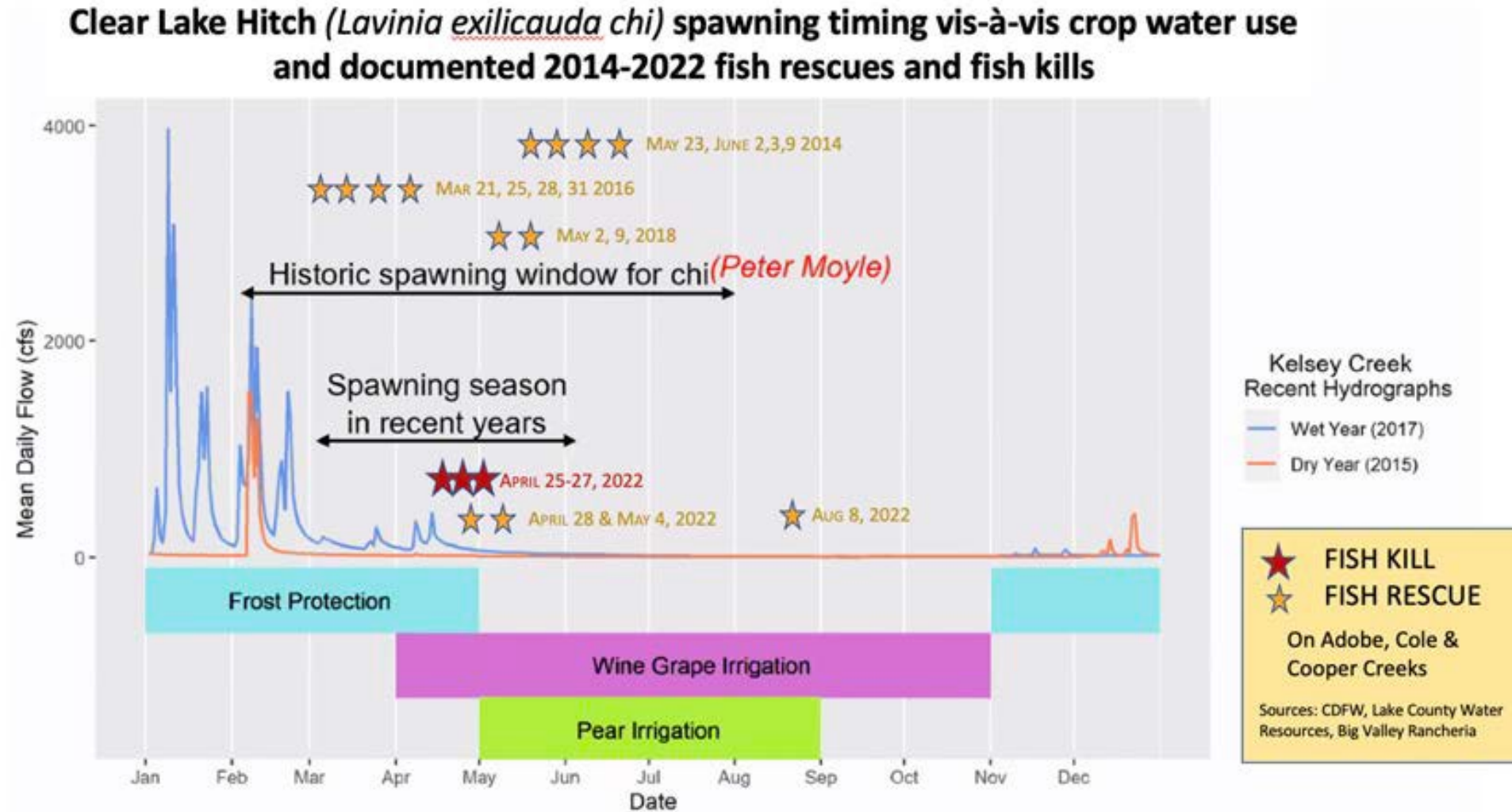
[HTTPS://NRM.DFG.
CA.GOV/FILEHANDL
ER.ASHX?DOCUMENT
TID=203432&INLIN
E](https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=203432&inline)

MEETING WILL
ALSO BE VIRTUAL,
CLICK ON THIS LINK:

[https://nrm.dfg.ca.g
ov/FileHandler.ashx
?DocumentID=203
431&inline](https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=203431&inline)

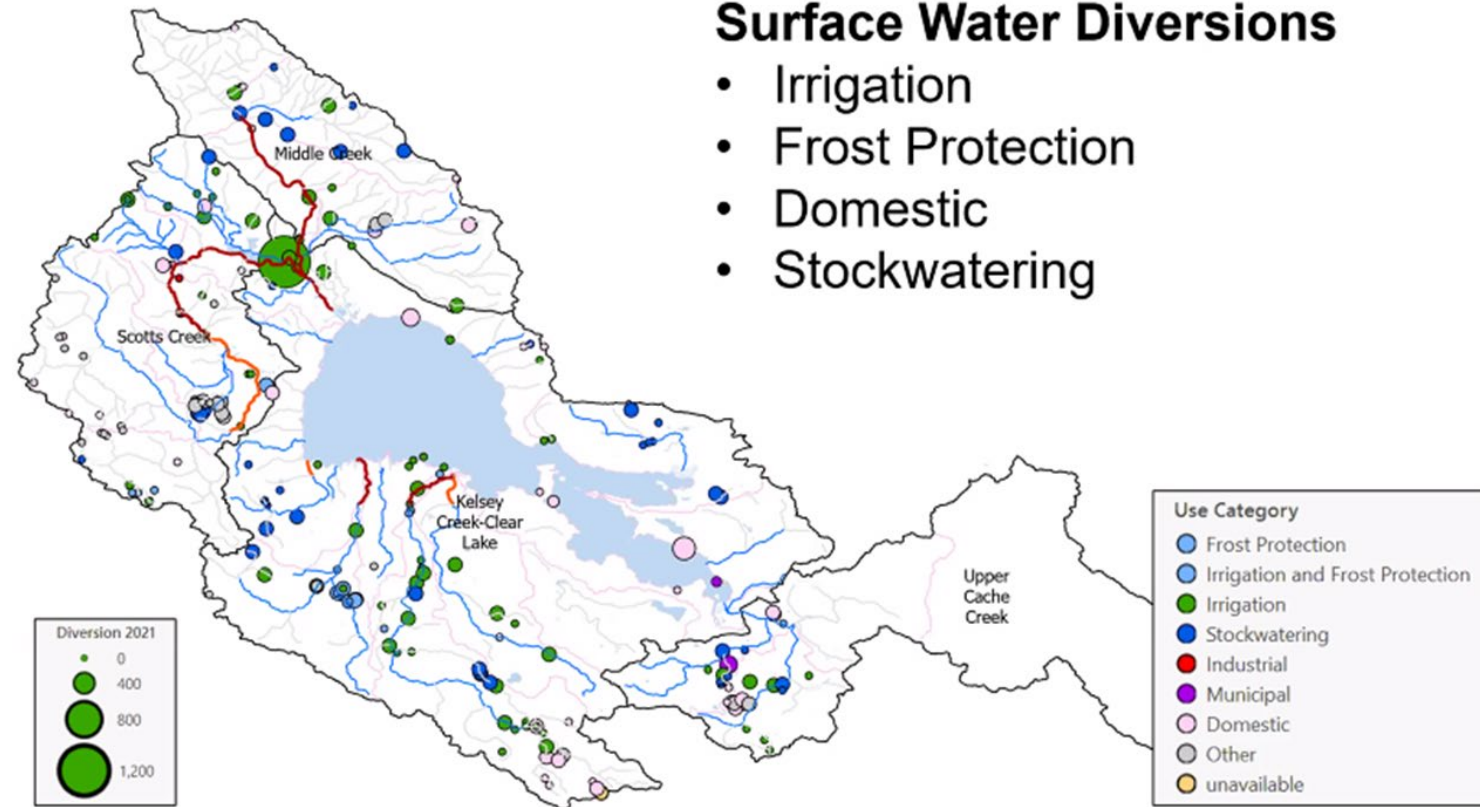
If any Big Valley Tribal Member needs a ride to Kings Beach for the meeting please call Alix at 707-262-2857 to **reserve your spot no later than Monday October 10, 2022.**

Data Collection and Evaluation



Surface water diversions from local use reporting to SWRCB shows millions of gallons being used each year during the hitch spawning run.

As for groundwater usage, “CDFW expects that a meaningful portion of streamflow depletion is attributable to shallow groundwater extraction.”



Right Status	Date of Application/ Acceptance	Point of Diversion		Uses - Irrigation		Uses - Domestic	Uses - Other				2013		
		POD Status	Direct Diversion Amount (Cubic Feet Per	Direct Div Season Begin Date	Direct Div Season End Date	Direct Div Season Begin Date	Use Type	Direct Div Season Begin Date	Direct Div Season End Date	Use Population/Acreage	Maximum Annual Draw (Gallons)	Total Annual Draw (Gallons)	Purpose of Use
Claimed	1967	Active	1.2	March	August	None	N/A	N/A	N/A	N/A	N/A	6,794,002	Irrigation 15 Acres (Vineyard), Stockwatering, Domestic 5
Permitted	1984	Active	20 AFA	None	None	None	Frost Protection	March	May	20 Acres	6,517,028	6,517,028	Frost Protection 20 Acres
Claimed	2006	Active	25 AFA	None	None	None	Frost Protection	March	May	25 Acres	N/A	5,930,496	Frost Protection
Permitted	1988	Active	50 AFA	November	April	None	Frost Protection	November	April	38.5 Acres	16,292,571	8,797,988	Irrigation 38.5 Acres (Vineyard)
													Frost Protection 38.5 Acres (Vineyard)
Permitted	1984	Active	36.1 AFA	None	None	None	Frost Protection	March	April	38.5 Acres	11,763,236	2,258,150	Frost Protection 38.5 Acres (Vineyard)
Permitted	1988	Active	73 AFA	November	November	None	Frost Protection	November	April	75 Acres	47,574,308	7,181,765	Irrigation 30 Acres (Vineyard), Frost Protection 30 Acres (Vineyard)
													Frost Protection 34 Acres (Vineyard)
Permitted	1988	Active	29 AFA	None	None	None	Frost Protection	March	April	34 Acres	9,449,691	531,137	
											38,010,566		

Chi Spawning Timing and Water Use

- Settler land use in the watershed has halved the spawning season for the chi. The majority of tributaries to the lake do not run during the time when the Clear Lake hitch fry need to be returning to the lake. The Clear Lake splittail, that ran after the chi, are now extinct.
- Limited data water use for irrigation and frost protection limits our understanding of how much water is needed and available for beneficial uses. Water management in the watershed has not prioritized data collection on surface water, groundwater, water use, and land use.
- Bias towards minimization of trends indicating the over-allocation of water and groundwater depletion in the Big Valley Subbasin Groundwater Sustainability Plan development.

12/2022 Hitch Emergency Summit Requests to Agencies

- Surface water curtailments on all Clear Lake creeks for declared Dry Years during Chi spawning season.
 - Precedent for no withdrawals during dry years: Yolo County does not receive their water rights when Clear Lake is below 3ft Rumsey on May 1st.
- Install gage in Adobe creek, with live readings (USGS)
- Support Tribe's modeling and data collection efforts
- Release water from Adobe creek and Highland springs reservoirs during Chi historic spawning run period.
- Support aquifer recharge projects (FloodMAR)
- Groundwater pumping curtailments within 1 mile of Clear Lake creeks for declared Dry Years during Chi spawning season.

Where Are We Now?

- “Dry Year” Surface water curtailment request
 - Mandated surface water use reporting is incomplete and inaccurate. Existing information is insufficient to assess impacts.
- Gage installation request.
 - A pressure transducer with telemetry (real time access) has been installed Adobe creek.
- Support Tribe’s modeling and data collection efforts
 - SWRCB staff has accepted data from the Tribe and is also conducting weekly measurements.
- Request releases of water from Highland Springs Reservoir
 - County of Lake has offered releases; not confident that releases would meet Clear Lake hitch needs.
 - Additional need to evaluate flow and passage in compliance with FGC requirements
- “Dry Year” groundwater pumping curtailment request
 - County of Lake would have to initiate and they are getting substantial pushback from agriculture.
 - Request for DWR to reject GSP for not properly evaluating impacts of groundwater to surface water flow <https://sgma.water.ca.gov/portal/gsp/comments/127>
 - A complete list of existing groundwater wells and well pumping rates are not available for SWRCB staff evaluation of pumping impacts.

What Else is Needed to Protect Native Species?

- Watersheds with listed species need information about water use. Use information orders early. Lack of water should be considered “Take” of the listed species.
- Tribes are engaged and committed. Collaborate and co manage with them.
- Water rights reviews and evaluations need to occur regularly– why collect data if you don’t assess for compliance?
- Continue to share information and build collaborations with other regulatory and informational agencies (CDFW, DWR) to improve response and evaluation of impacts.
- Data gaps include a complete listing of well completion logs (DWR) and groundwater and surface water use (SWRCB)
- Improved enforcement and compliance of existing codes should be required in watersheds with listed species. **Change = Standards/Regulations x Enforcement**
- Build resiliency into policies because climate change requires us to be proactive.
 - **Climate change induced droughts require increased vigilance to prevent downstream water impacts.**

Priorities for Native Species Protection

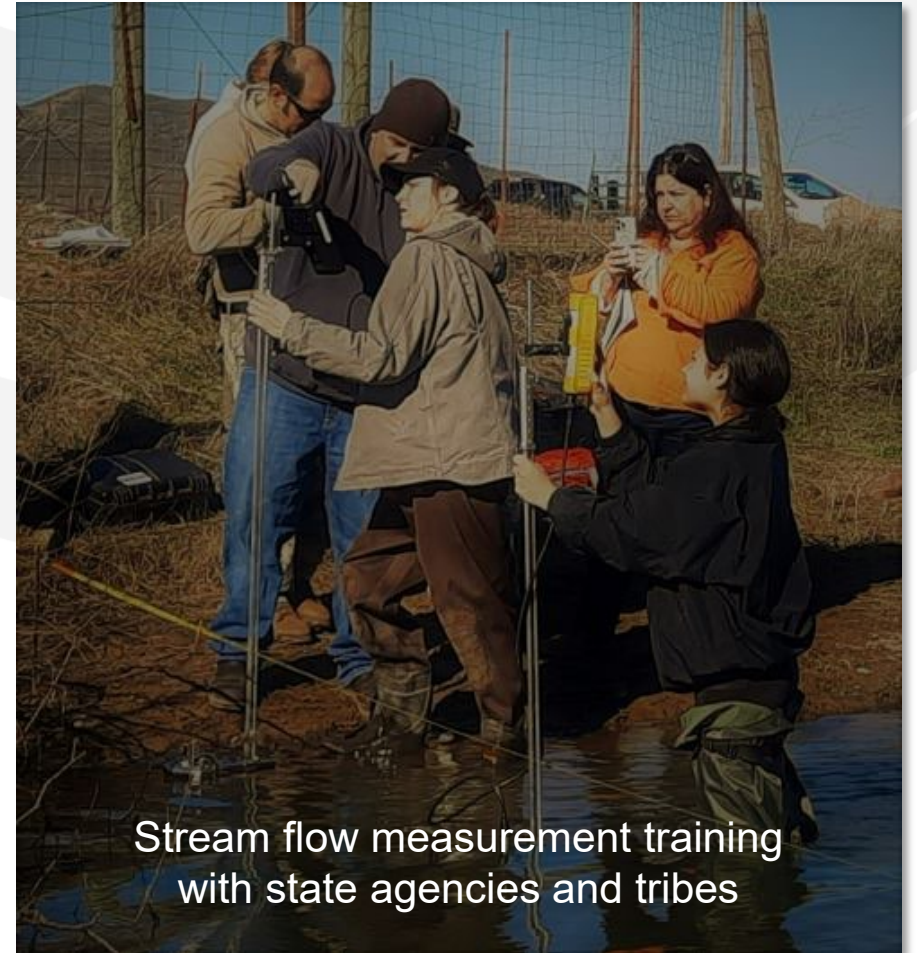
- State and local agencies have authorities to protect native resources yet lack the information and funding or have limitations in scope to carry out the tasks in a timely way. A multi jurisdictional resource management approach should be prioritized for any listed species.
- No more loss of species on our watch. Use the tools that exist.



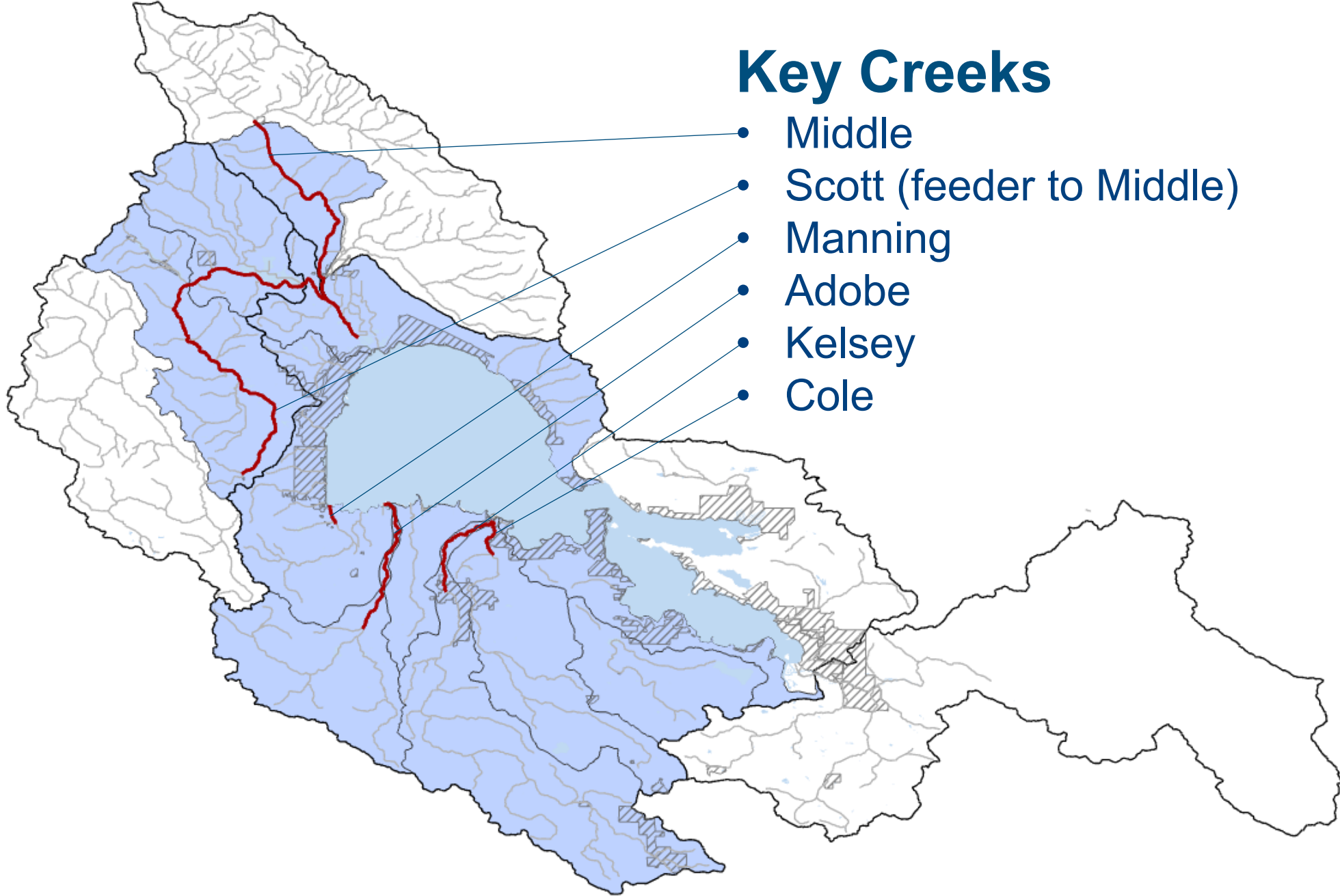
State Water Board Response

- Coordination & Engagement
- Data Collection & Analysis
- Monitoring
- Voluntary Actions
- Enforcement

What we've learned so far...



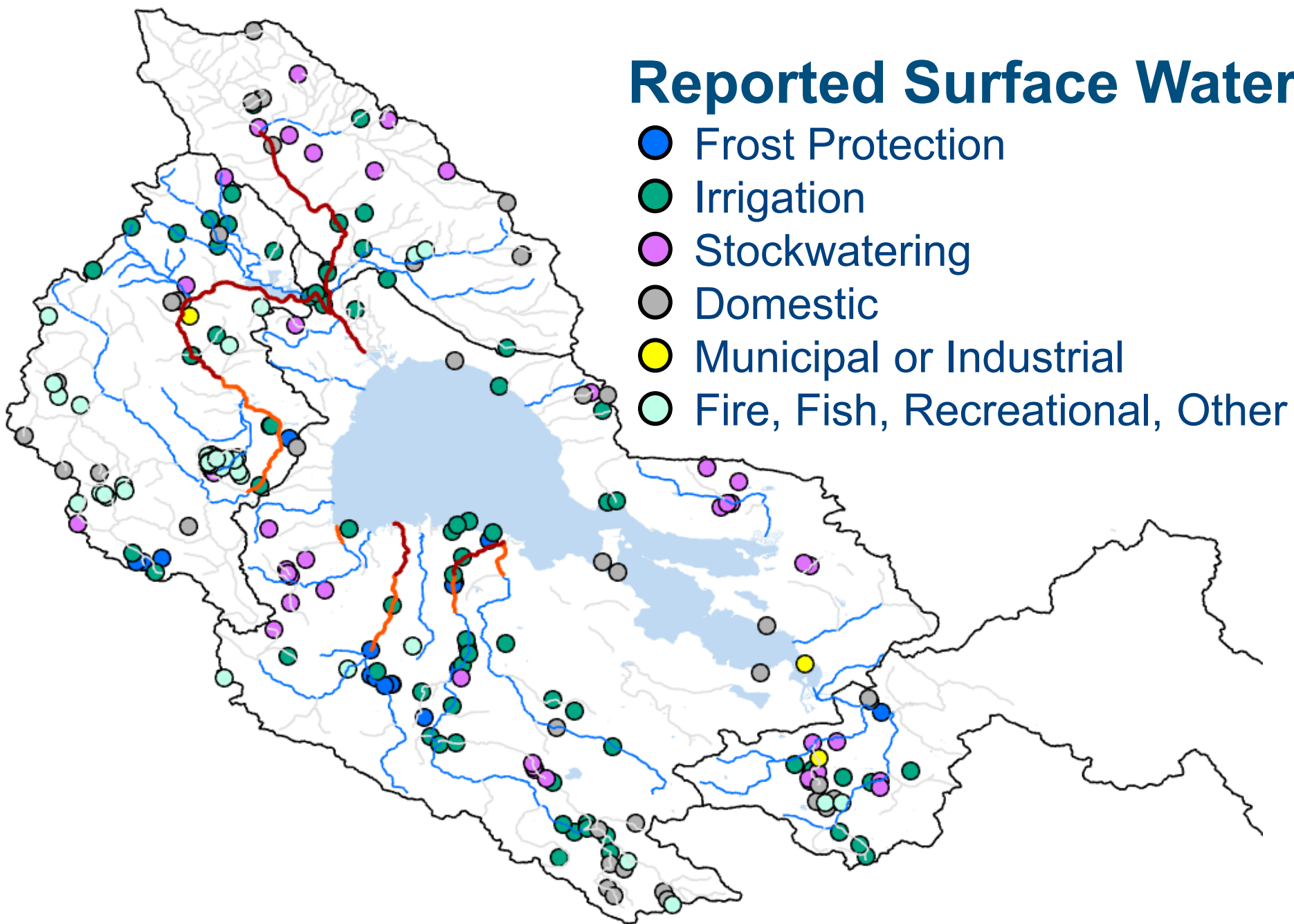
Stream flow measurement training
with state agencies and tribes



Key Creeks

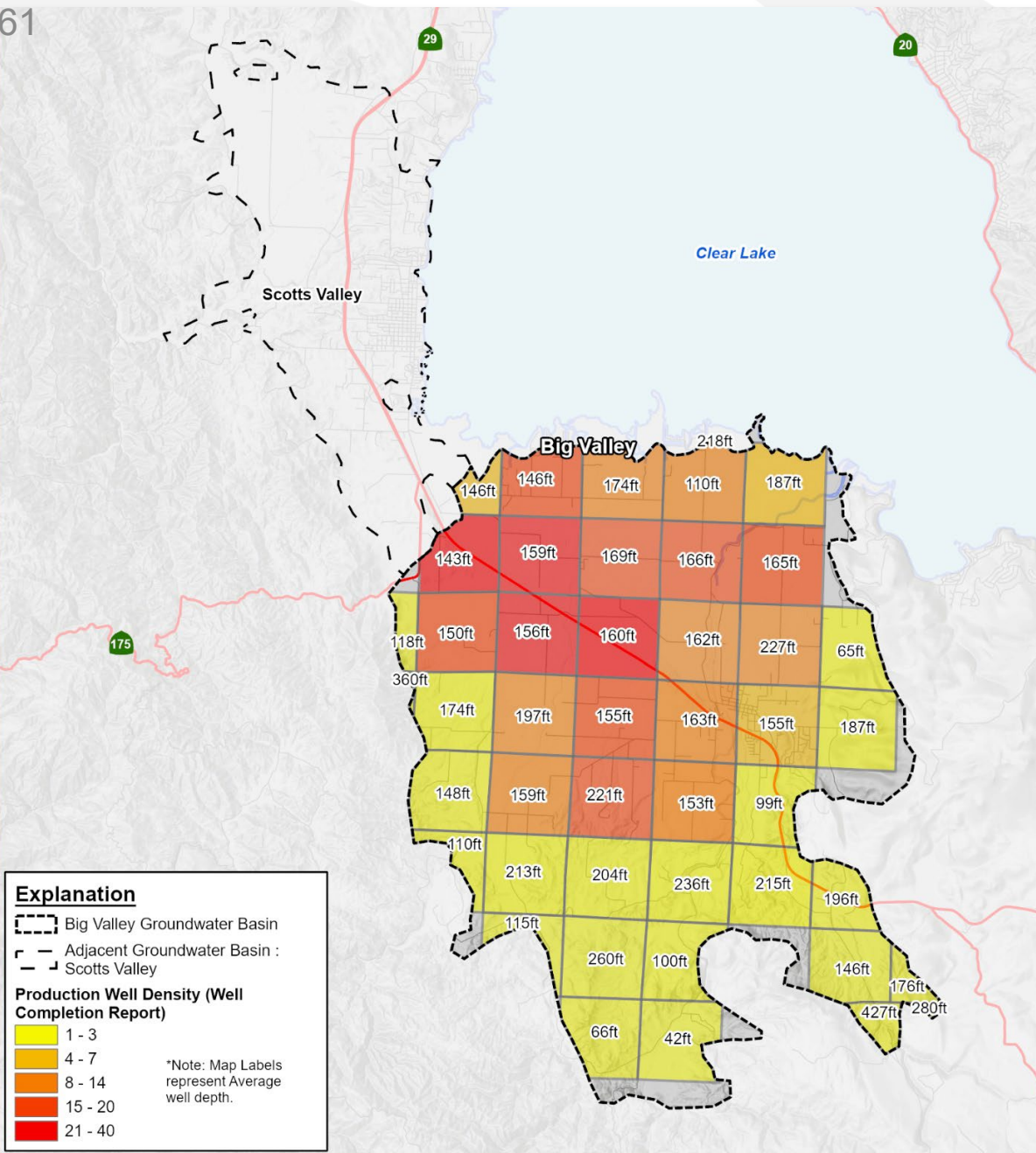
- Middle
- Scott (feeder to Middle)
- Manning
- Adobe
- Kelsey
- Cole

Reported Surface Water Diversions



Groundwater

- 90% used for agriculture
- Lots of wells near creeks
- Creeks mainly rain-fed
- Creeks are losing during dry months
- ***More data/monitoring needed***
- Groundwater pumping impacts streamflow.
- We need to determine to what degree pumping is impacting Clear Lake Creeks.
- We need data to do this.



Other Drivers: Passage Barriers



Without sufficient creek flows the hitch cannot survive.

Other Drivers: Water Quality

Central Valley Regional Board:

- Nutrient and Mercury TMDLs
- Tribal Beneficial Use Designation
- Cannabis Inspections and Enforcement
- Irrigated Lands Regulatory Program Implementation
- Harmful Algal Blooms Environmental Study
- Blue Ribbon Committee for the Rehabilitation of Clear Lake



Water Rights Enforcement

225 rights near creeks

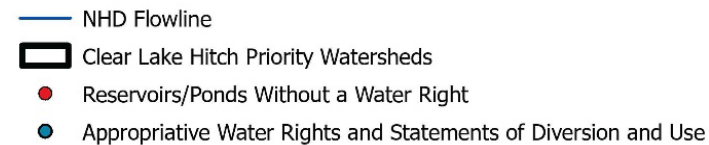
- Half didn't report for 2022
- Other half is poor quality

100 subject to measurement regulations

- 90% out of compliance

200 reservoirs w/o water rights near creeks

Investigations underway



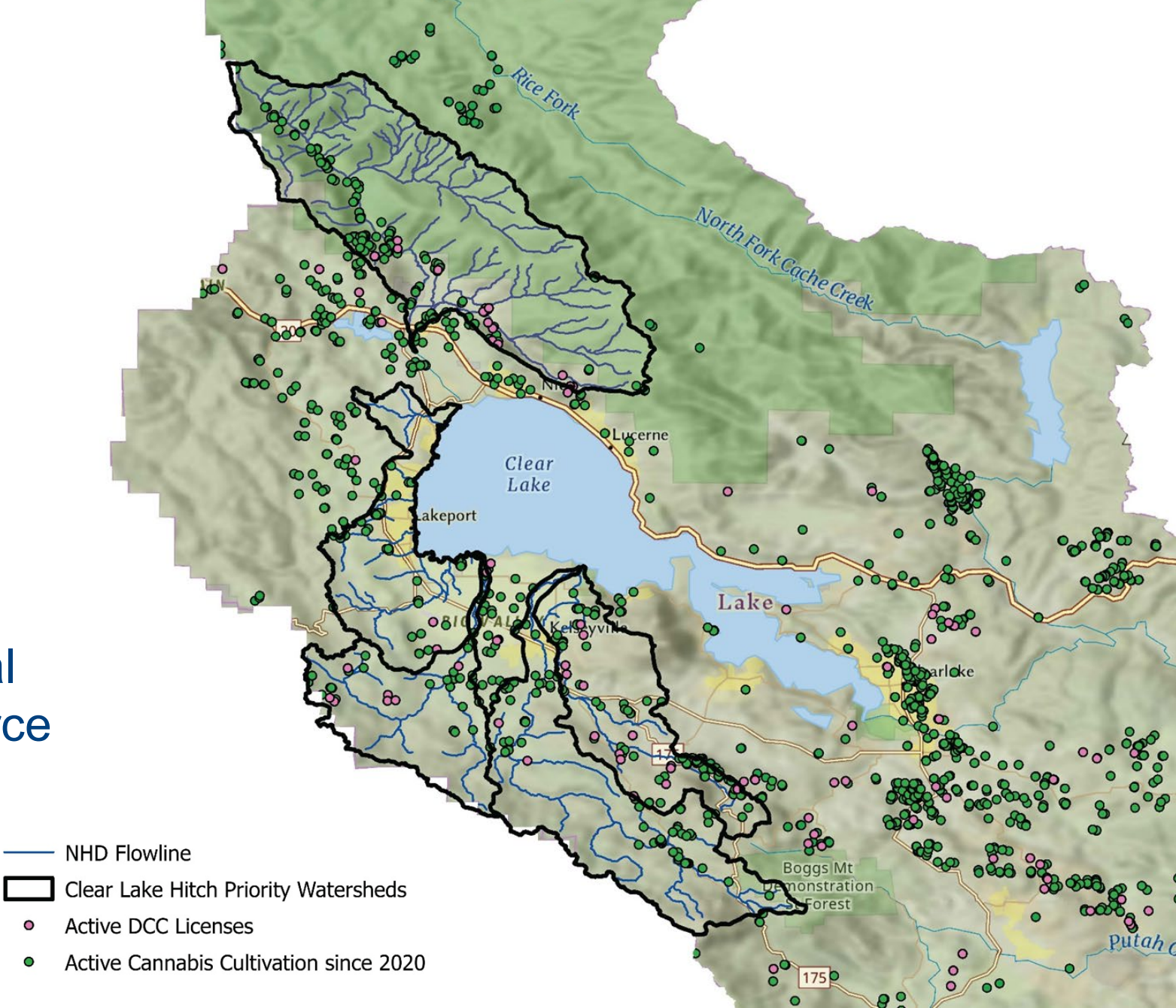
Cannabis Enforcement

90% of cannabis cultivation in Lake County is illegal

1,000+ illegal sites

250+ near key creeks

Coordinating with state and local agencies to investigate and enforce



Wrap Up and Next Steps

- Still early in the effort- many questions
- One wet year will not save the hitch
- Continued coordination, engagement and enforcement
- Get the information we need to make informed decisions
- Identify solutions and support

Can't let uncertainty lead to extinction!

