

2019 Putah Creek Watershed Monitoring and Prevention

**Watershed Information & Conservation Council
September 26, 2019**

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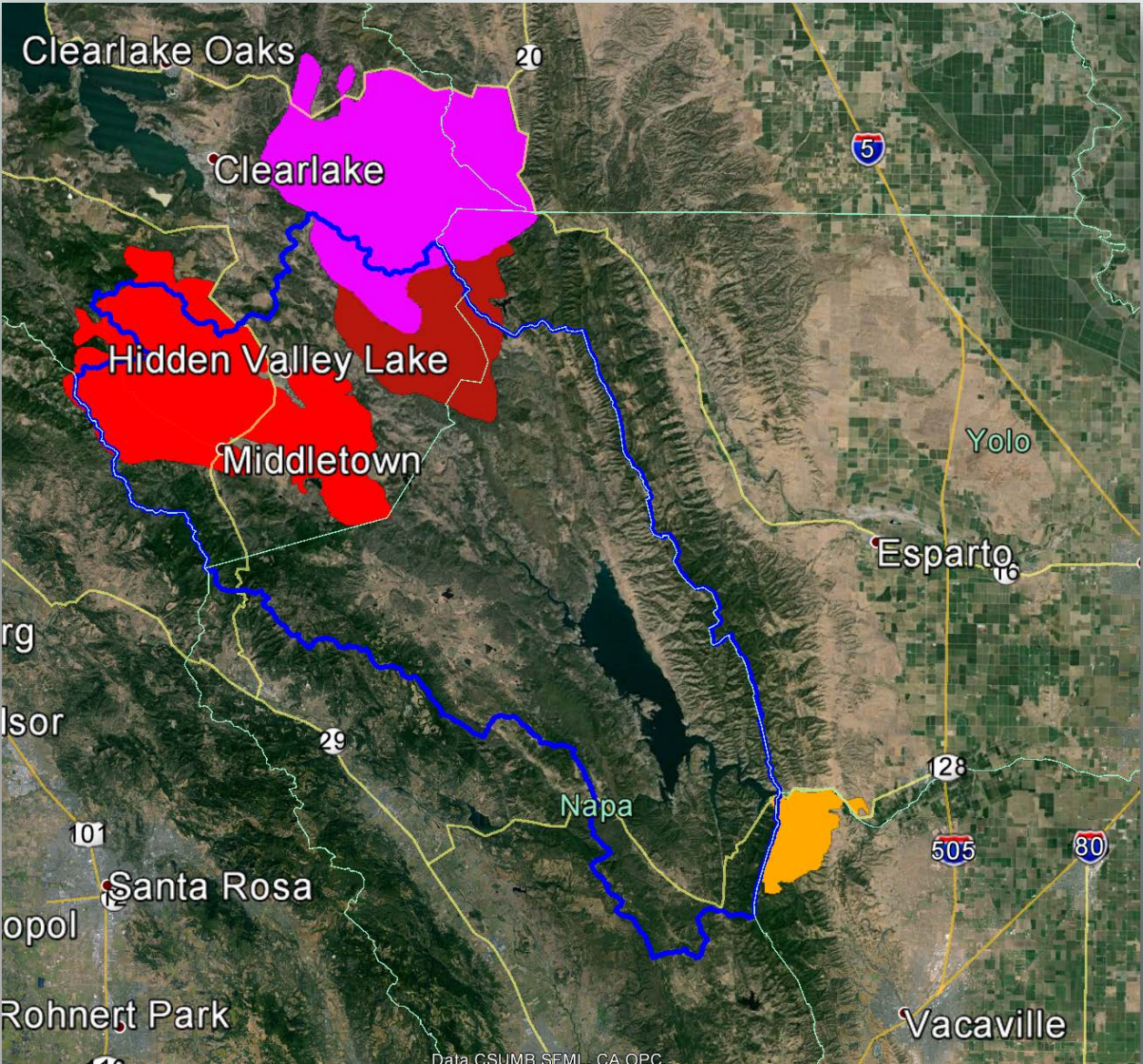
OVERVIEW

- Water Quality Monitoring and Sampling
 - Post Fire Sediment Loads
 - Aquatic Invasive Species
- Prevention Plans and Programs
 - Lake Berryessa
 - Lake Hennessey
 - Decontamination Services
- Future Plans

A photograph of a river flowing through a forested area. The river is the central focus, with water that appears slightly turbid and is surrounded by dense, green vegetation on both banks. The trees and bushes are lush, suggesting a healthy ecosystem. The overall scene is a natural, outdoor setting.

EVENT BASED POST-FIRE MONITORING

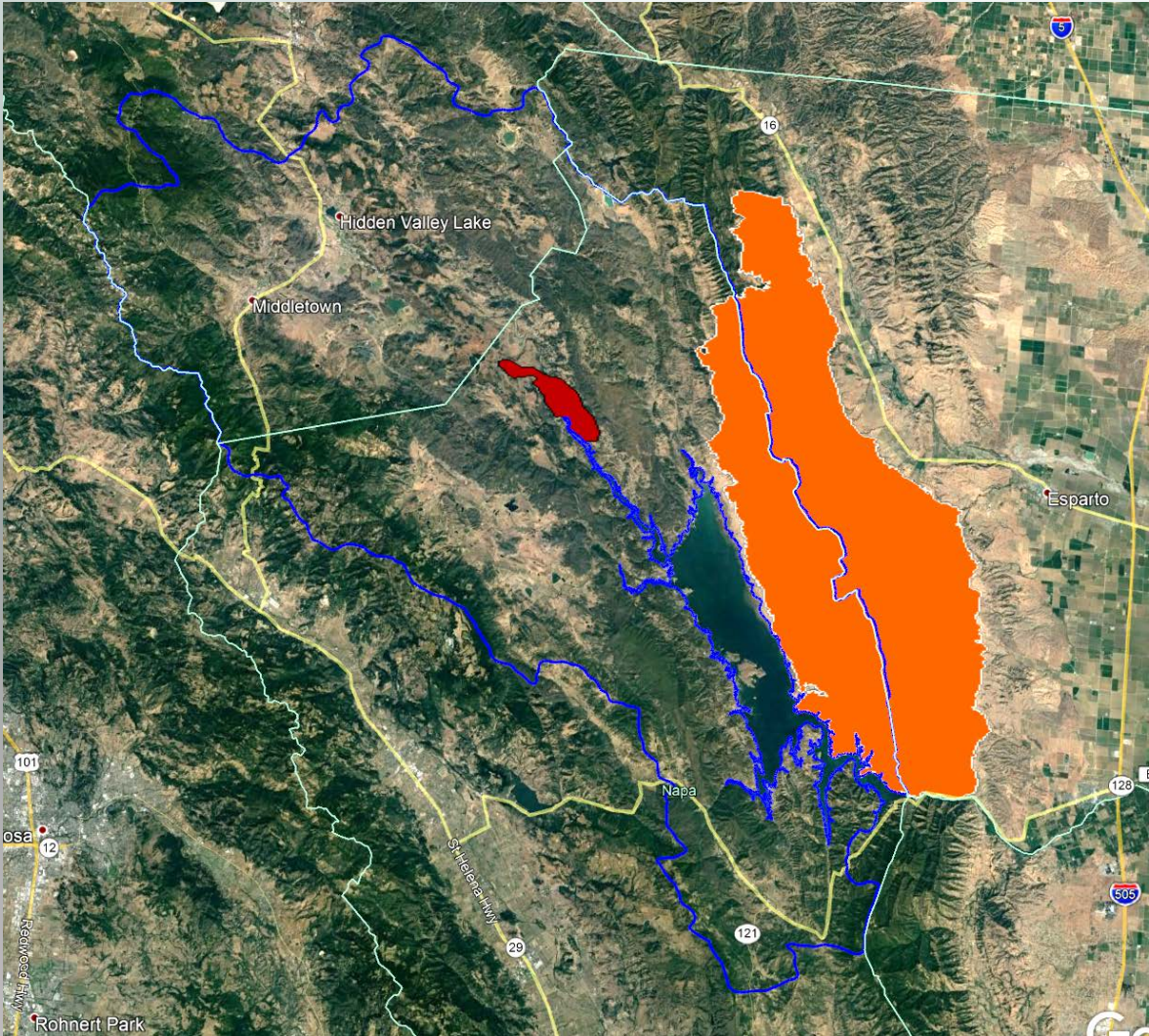
WILDFIRES IN 2015



Fire	Area (acres)
Wragg Fire (UC Stebbins Reserve)	8,051
Rocky Fire (Cache Creek Reserve)	69,636
Jerusalem Fire (NE of Middletown)	25,118
Valley Fire (Cobb, Middletown, HV)	76,067

Total = 180,000 acres (333 mi²)
(10 x Lake Berryessa)

WILDFIRES IN 2018

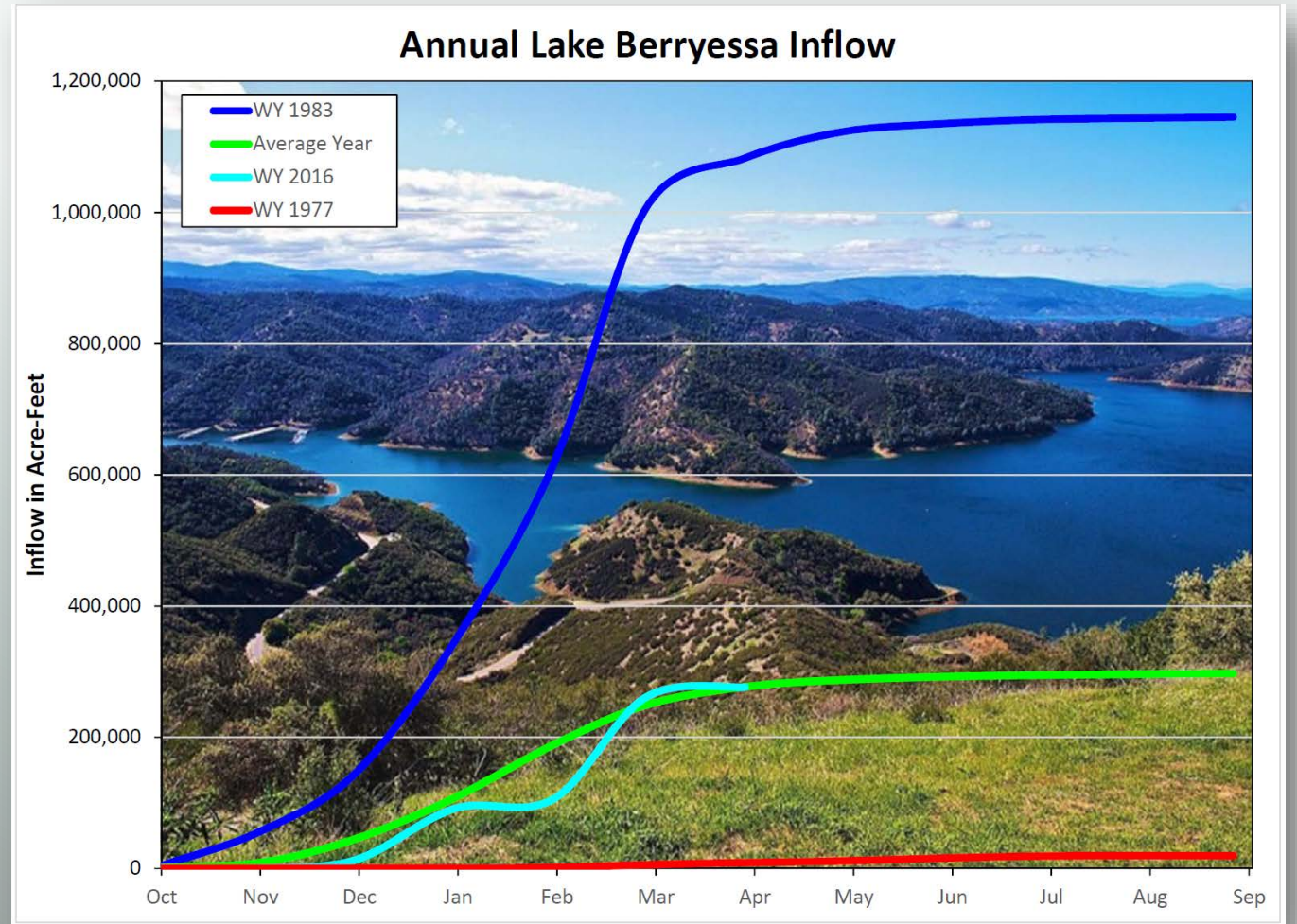


Fire	Area (acres)
County Fire (East of Lake Berryessa)	90,288
Snell Fire (Upper Putah Creek, North of Walter Springs)	2,490

Total = 92,778 acres (145 mi²)

POST-FIRE WATER QUALITY MONITORING

- ▶ Water Quality concerns to Lake, Napa, and Solano Counties
- ▶ Monitoring administered in 2015 and 2018
- ▶ Partnered with Hidden Valley Lake CSD & Napa County for Water Quality monitoring (2015)



CONSTITUENTS

Tier I (2015 and 2018)

Title 22 (Mineral, Physical, Inorganics) + TOC/DOC +
Nutrients

Tier II (2015 and 2018)

Polycyclic Aromatic Hydrocarbons
(PAHs)

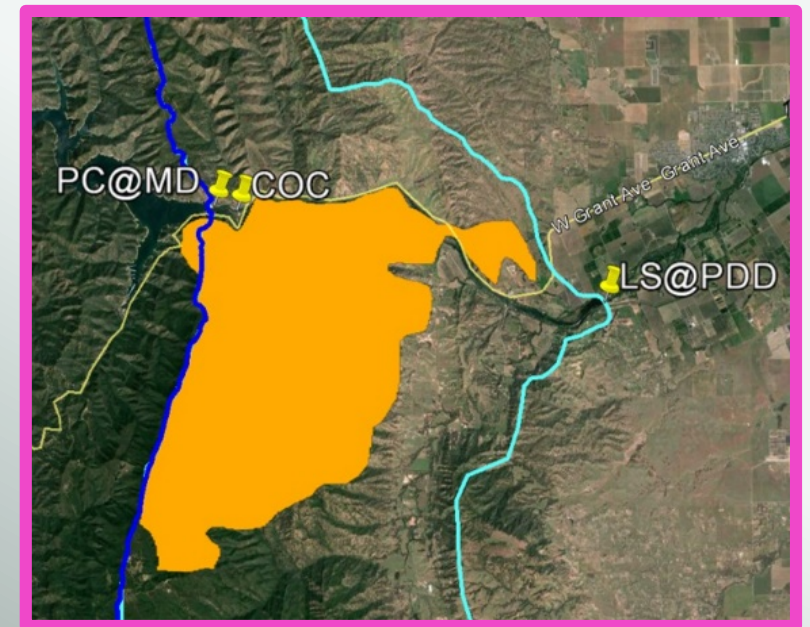
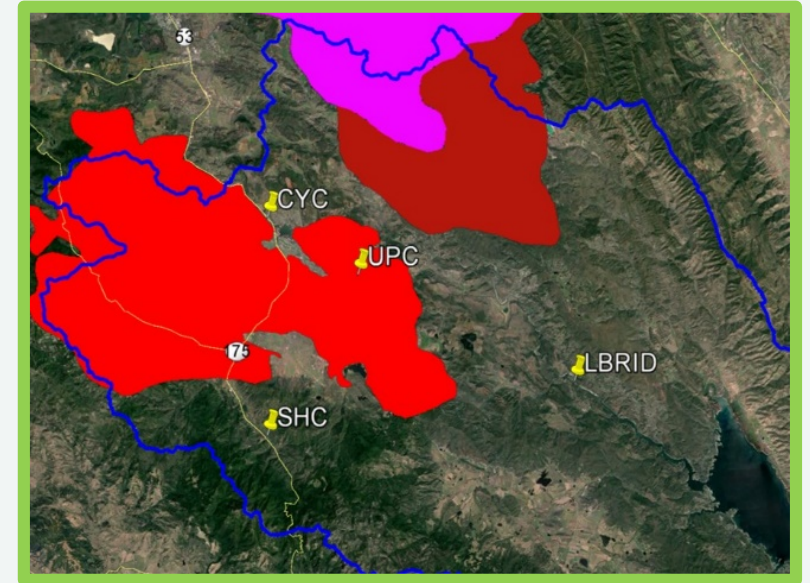
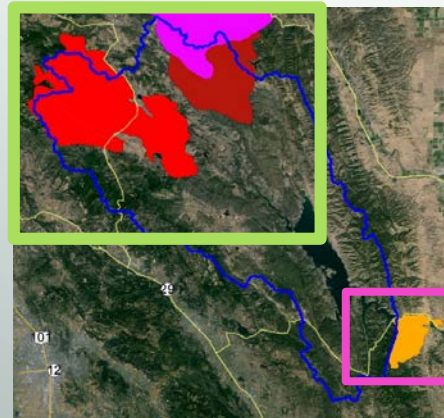
Tier III (Interdam Reach 2015 only)

Trihalomethane Formation Potential
(TTHMFP)



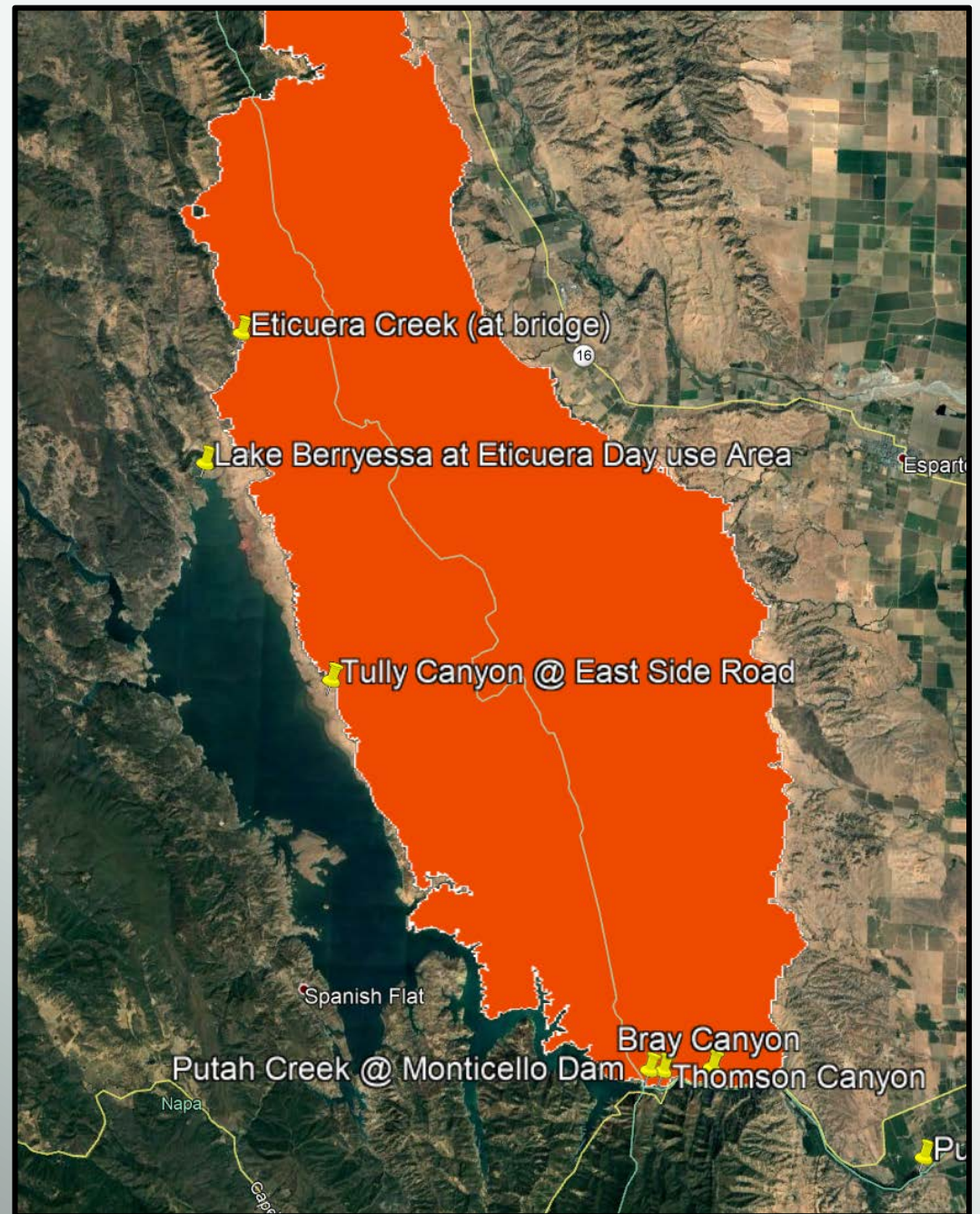
2016 SAMPLE LOCATIONS

Name	Description
SHC	St Helena Creek (Control)
CYC	Coyote Creek (Partial, Small Tributary)
UPC	Putah Creek (Upper, Sig Burn Impact)
LBRID	Putah Creek (Middle, U/S L. Berryessa)
PC@MD	Putah Creek (Lower D/S L. Berryessa)
COC	Cold Canyon Creek (U/S of Putah Ck)
LS@PDD	Lake Solano at Diversion Dam (Intake)



2018 SAMPLE LOCATIONS

Name	Description
EC	Eticuera Creek @ Bridge
LB@EDU	Lake Berryessa @Eticueta Day Use Area
TC@ESR	Tully Canyon @ East Side Road
PC@MD	Putah Creek (Lower D/S L. Berryessa)
PC@TC	Putah Creek @ Thomson Canyon
PC@BC	Putah Creek @ Bray Canyon
LS@PDD	Lake Solano @ Diversion Dam (Intake)



2016 KEY RESULTS

What did we see?

- Cold Canyon Creek (Interdam Reach) had the worst WQ
- No significant WQ degradation in Upper Putah Creek
- Upper Putah Creek has excellent WQ!
- Godzilla El Nino → Average Water Year for Putah Creek



2018 KEY RESULTS

What did we see?

- ▶ North East side of Lake Berryessa contained the worst WQ (Tully Creek Ranch, Eticuera Creek, and Lake Berryessa @ Eticuera Day Use Area)
- ▶ Spikes in Organics(TOC/DOC), Physical Properties (Conductivity/Alkalinity), Sediments (TSS, Turbidity, Color), Nutrients, Minerals and Metals.
- ▶ All sites- overall minor changes in Nutrients, Sulfate, pH, Total Dissolved Solids, Turbidity, Organic Carbon, Chloride, Iron, Color, Taste and odor.
- ▶ From the Lower Putah Creek side (Interdam Reach) largest WQ changes at Thomson Canyon

LAKE BERRYESSA WATERSHED SANITATION SURVEY

- Required by State Water Resources Control Board DDW (PSC Municipal Users)
 - Solano Project Watershed Sanitary Survey
(Focuses on WQ issues below Lake Berryessa)
 - Lake Berryessa Watershed Sanitary Survey
(Focuses on Upper Putah Creek & Lake Berryessa)
- Prior Survey (2018) by Palencia Consulting Engineers
 - Prepared for Napa County Flood Control Water Conservation District and SCWA

AQUATIC INVASIVE SPECIES OF CONCERN



Zebra Mussels
(*Dreissena polymorpha*)



Quagga Mussels
(*Dreissena rostriformis bugensis*)



Golden Mussels
(*Limnoperna fortunei*)



New Zealand Mud Snail
(*Potamopyrgus antipodarum*)



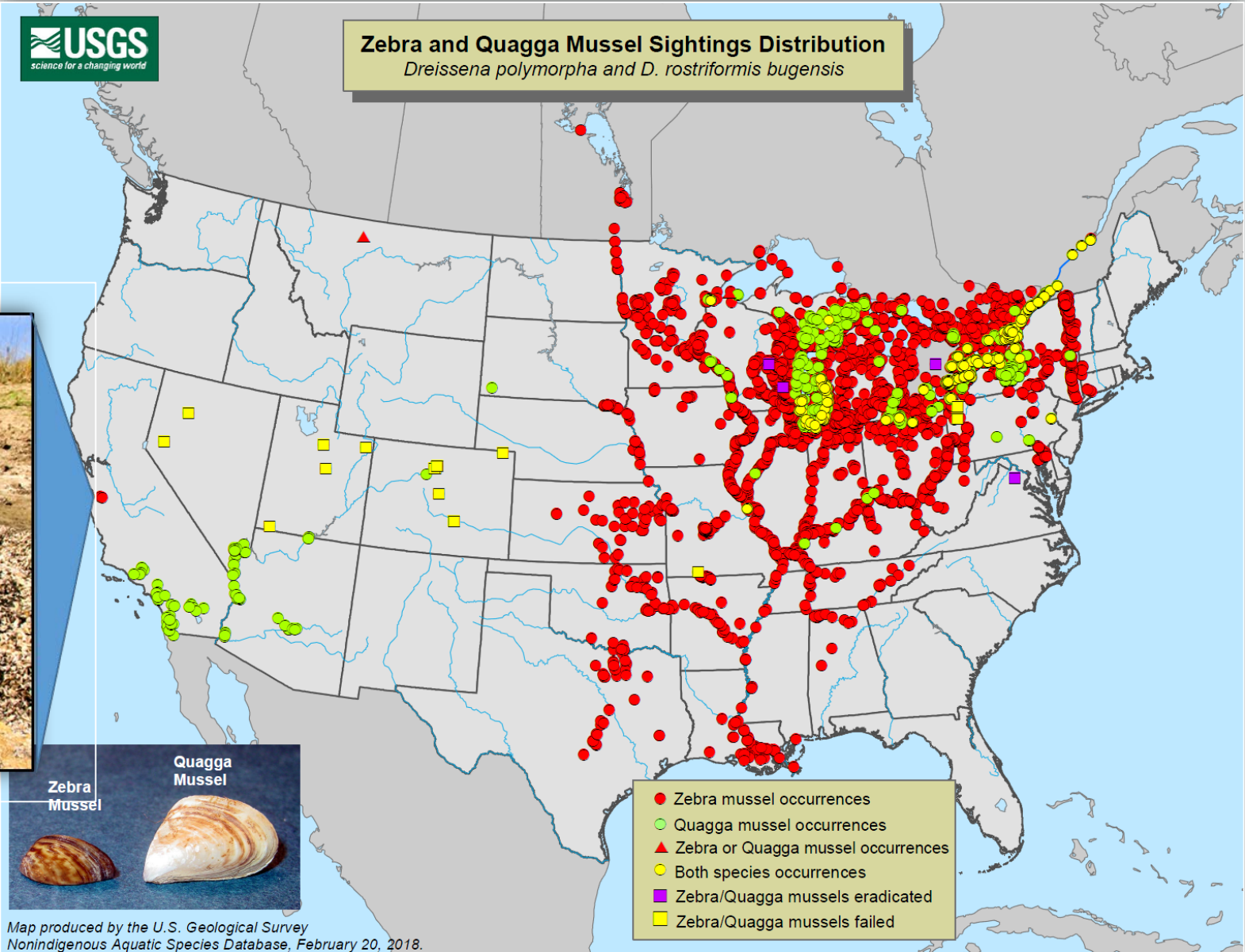
Chinese Mystery Snail
(*Cipangopaludina chinensis*)

IMPACTS OF ZEBRA OR QUAGGA MUSSEL INFESTATION

- Ecological impacts
 - Native species become affected
 - Competition
- Recreational impacts
 - Maintenance on vessels
 - Fish population decline
- Economic impacts
 - Maintenance Cost of Water Infrastructure
 - Local Tourism Business
 - Decreased property value



MUSSELS GETTING CLOSER TO NORTHERN CALIFORNIA



SOLANO PROJECT PREVENTION PLAN – LAKE BERRYESSA

CA Fish & Game Code (FGC):
Section 2302 (Appendix 1)
Aquatic Invasive Species

CA Code of Regulations (CCR):
Title 14, Section 672.1 (b) (Appendix 2)
Driessenid Mussel Control and Prevention

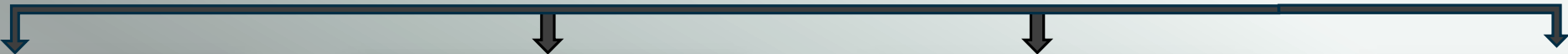


Required Annual Updates

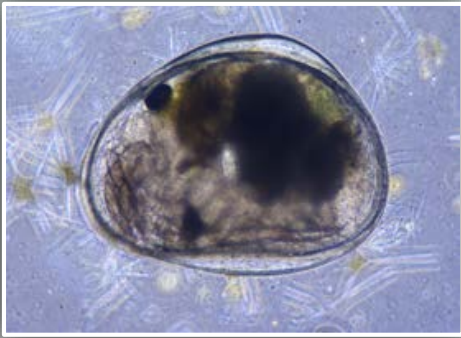


Monitoring Report of Results

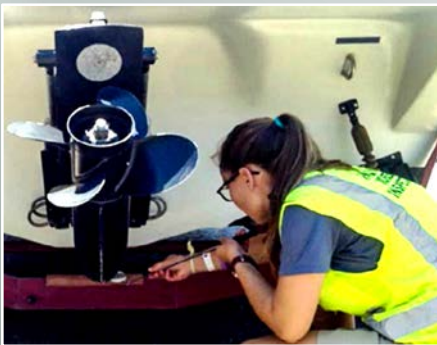
Prevention Plan Changes & Activities



Monitoring



Layered Science



Inspections



Decontaminations

SOLANO PROJECT PREVENTION PLAN - LAKE BERRYESSA



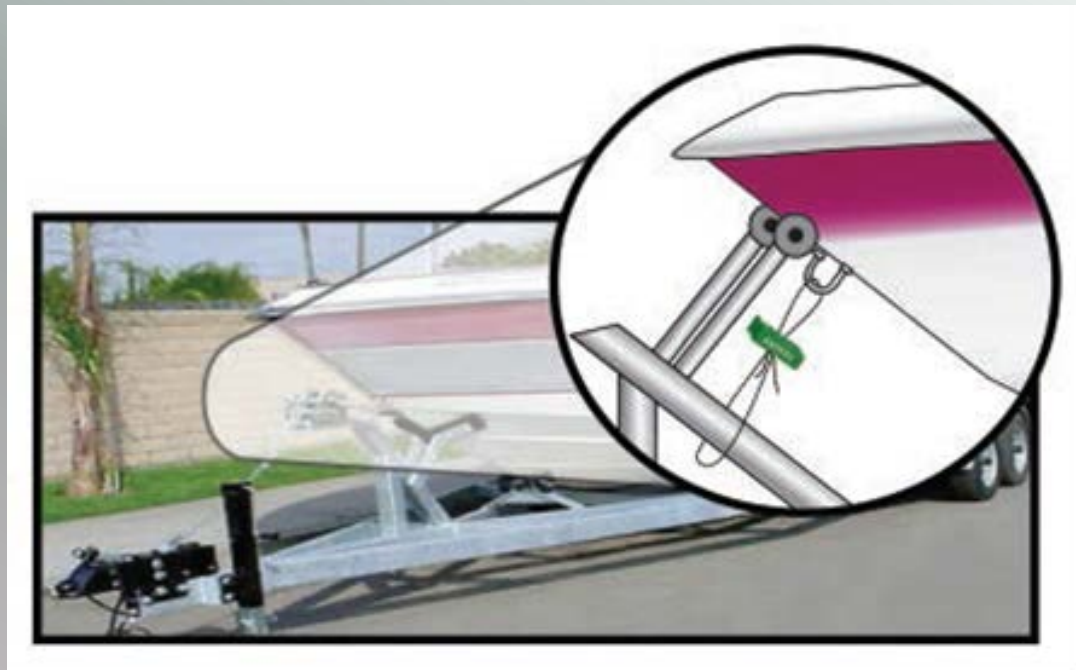
2019 Mussel Inspection Team of Interns

13, 557 Boats Inspected, 63 High Risk Boats



LAKE BERRYESSA - SEALS AND RECEIPTS

- Secure method for prevention
- Separates locals from 'Foreign' Boaters
- Speeds up Inspection process



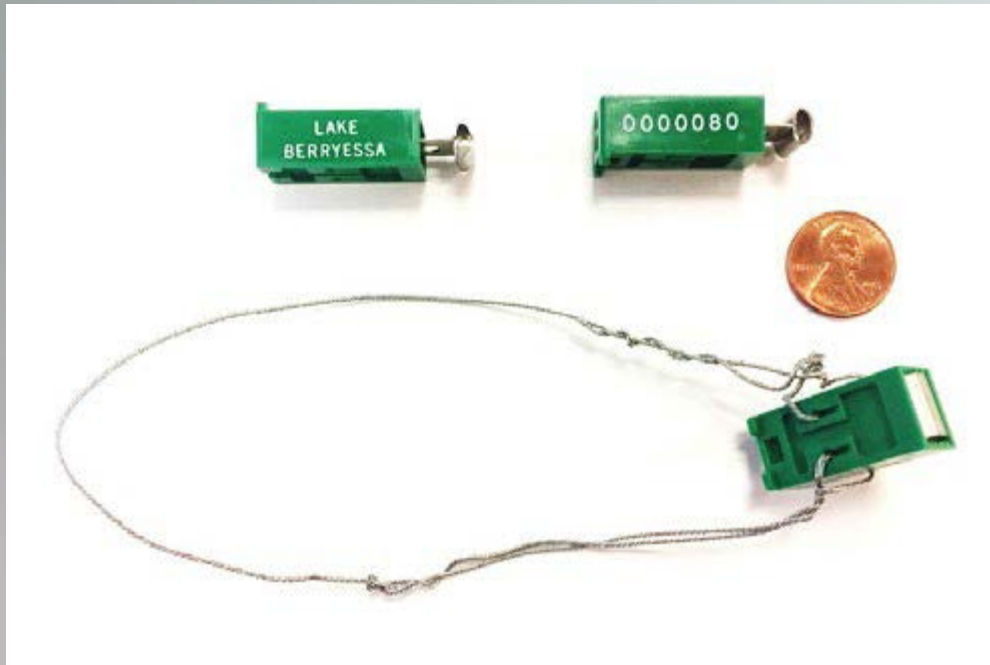
0003353

LAKE BERRYESSA WATERCRAFT INSPECTION FORM			
Inspector: (Print Name) <i>Zach H</i>	Form In Database: (Initial here)		
Date: <i>7/24/19</i>	Time: <i>9:31</i> (AM/PM)	Ramp: <i>Steele</i>	Other:
Intact LB Seal #: (if 3353)			
OPERATOR / VESSEL INFORMATION			
Boat Type: <input checked="" type="radio"/> Fishing <input type="radio"/> Ski/Wake <input type="radio"/> PWC/Jet Ski <input type="radio"/> Pleasure <input type="radio"/> Pontoon <input type="radio"/> Other: <i>Specify</i>			
Registration #: <i>CF 5320RG</i>	Zip Code: <i>95688</i>		
<i>*Intact Green Lake Berryessa Watercraft Seal indicates this watercraft exited Lake Berryessa on the recorded date. Lake Berryessa is known to be Negative for Zebra and Quagga Mussels.</i>			
<small>For questions regarding the Lake Berryessa Mussel Prevention Program, please contact Solano County Water Agency at 707-451-6090. For information on invasive mussel issues, visit www.100thmeridian.org *Pursuant to the California Department of Fish and Wildlife, Fish and Game Code § 2301: a person shall not possess, import, ship, or transport in the state, or place, plant, or cause to be placed or planted in any water within the state, aquatic invasive mussels.</small>			

LAKE BERRYESSA - SEALS AND RECEIPTS

Right: Jasmie Installing a seal on a Jet Ski before leaving Steele Canyon Launch ramp.

Below: Example of Lake Berryessa Custom Seal (open and closed with tampered wire)



LAKE BERRYESSA - WATERCRAFT INSPECTION AND DECONTAMINATION DATABASE (WID)

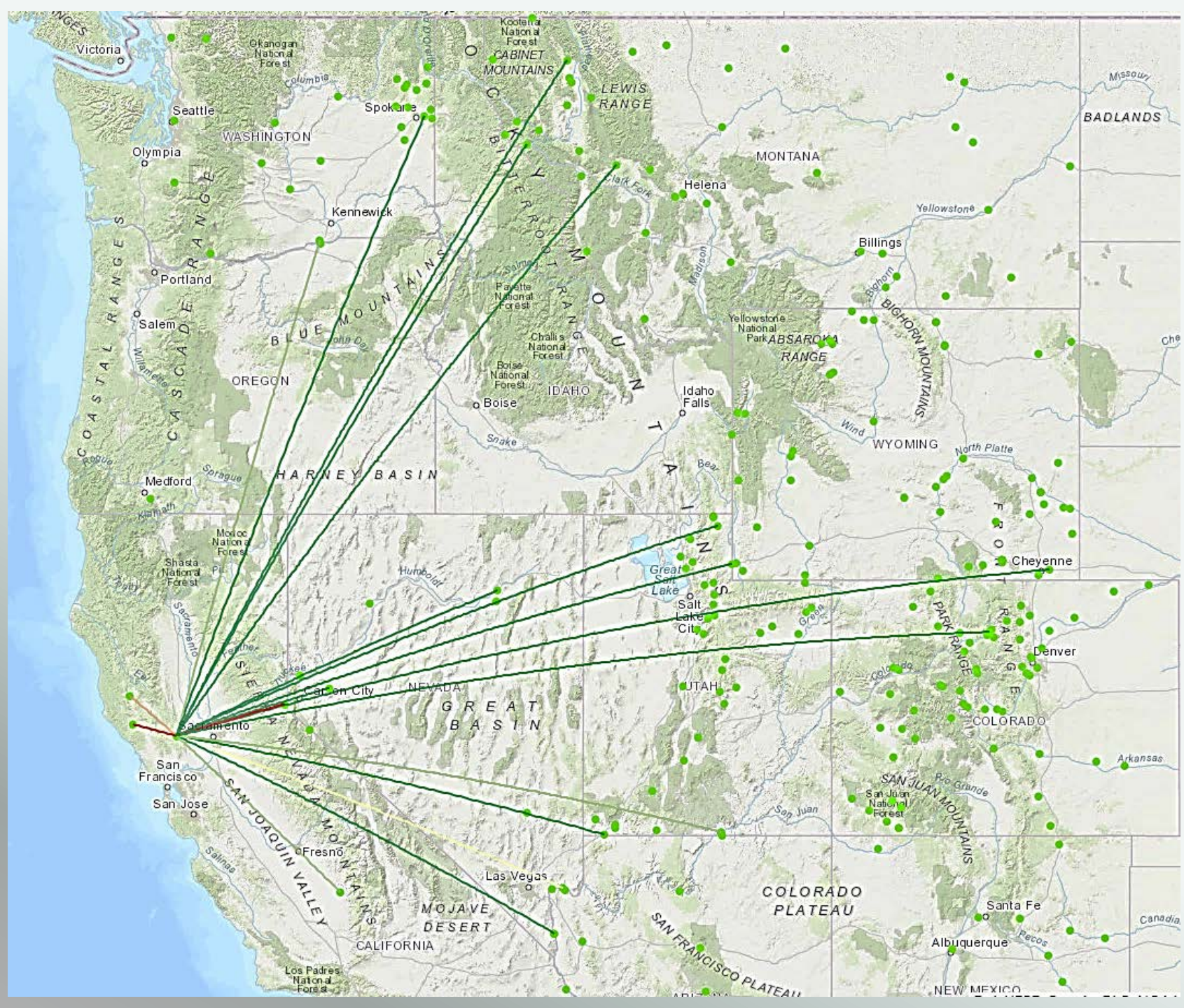
The image shows two views of the WID application. On the left, an iPad screen displays the 'Identify' step of an inspection, with a dropdown menu for 'Ramp' selection. The menu lists: Markley Cove, Pleasure Cove, Steele Canyon, Capell Cove, Spanish Flat, and Putah Canyon. The iPad interface includes fields for Date (Nov 30, 2018), Time (3:11 PM), Inspector No. (1), and Location (CA - Lake Berryessa). On the right, a desktop monitor shows the main WID interface. The header includes the Solano Water Agency logo, the title 'Watercraft Inspection and Decontamination Web', and user information: 'Logged in as scolias@scwa2.com', 'User role: Coordinating Agency Admin', and a 'Log off' link. The desktop interface features a navigation menu (Home, Inspections, Reports, Forms, Training, Administration) and an 'Inspection Index' section. It includes search filters for Start Date (1/1/2019), End Date (9/5/2019), Coordinating Agency (Solano County Water Agency), Locations (All Locations), and Ramps (All Ramps). The main form contains fields for Inspector No., Registration, Watercraft, Propulsion, In/Out, and Seal Code/Color. Below these are sections for Risk Factors (Out Of State/Province In 30, Been In Positive Waters, Last Water Visited, Next Destination, Dirty, Crusty, Slimy, Complex, Standing Water, Ballast Boats), Protocols (Hull, Engine, Anchor, Drain), Bait Present/Type/Result, Mussel Dog or Canine Utilized?, Decontamination Results (Full, Standing Water, Plant), Decontamination Reason, Invalid Seal Removal Reasons (Missing Receipt, Tampered Seal, Seal Doesn't Match Receipt), and Batch Reference/Identify Duplicates. An 'Apply' button is at the bottom right.

- Use iPads to update and track the movement of all watercraft.
- Over 30 Users!
- Records:
 - Registration Number and Boat I.D
 - Inspection History
 - Seals Applied/Removed
- Helps us be more efficient

Map:

Watercraft shared in 2019
between Lake Berryessa
and other reservoirs

- Oregon
- Washington
- Idaho
- Montana
- Wyoming
- Colorado
- Utah
- Nevada



DECONTAMINATION STATION



Inspection Results:
Unverifiable Standing Water
Unknown Launch History
High Risk Boat



Sent to Decontamination:
Located at Steele Canyon Resort
Free to All Boaters



Professional Decontamination:
Exterior & Motor = 140 ° H2O
Interior & Accessories = 120° H2O
Waste Water Contained/ Recycled



SAFE TO LAUNCH!



LAKE HENNESSEY



Boating Regulations



- Permits Required
- Can only *USE* Motor < 10 MPH Only (Trolling or small Outboard Motor)
- No Paddle Boards/ Float Tubes
- No dogs in Lake or Streams



LAKE HENNESSEY – AQUATIC INVASIVE PREVENTION



- CDFW does monitor for Aquatic Invasives (AIS)
- Water Quality is conducive for infestation, slightly acidic (CDFW)
- Motorized boats (fishing boats) are a risk for transporting AIS
- Fishing Equipment are a risk for transporting AIS
- No Prevention Plan on File (CDFW)

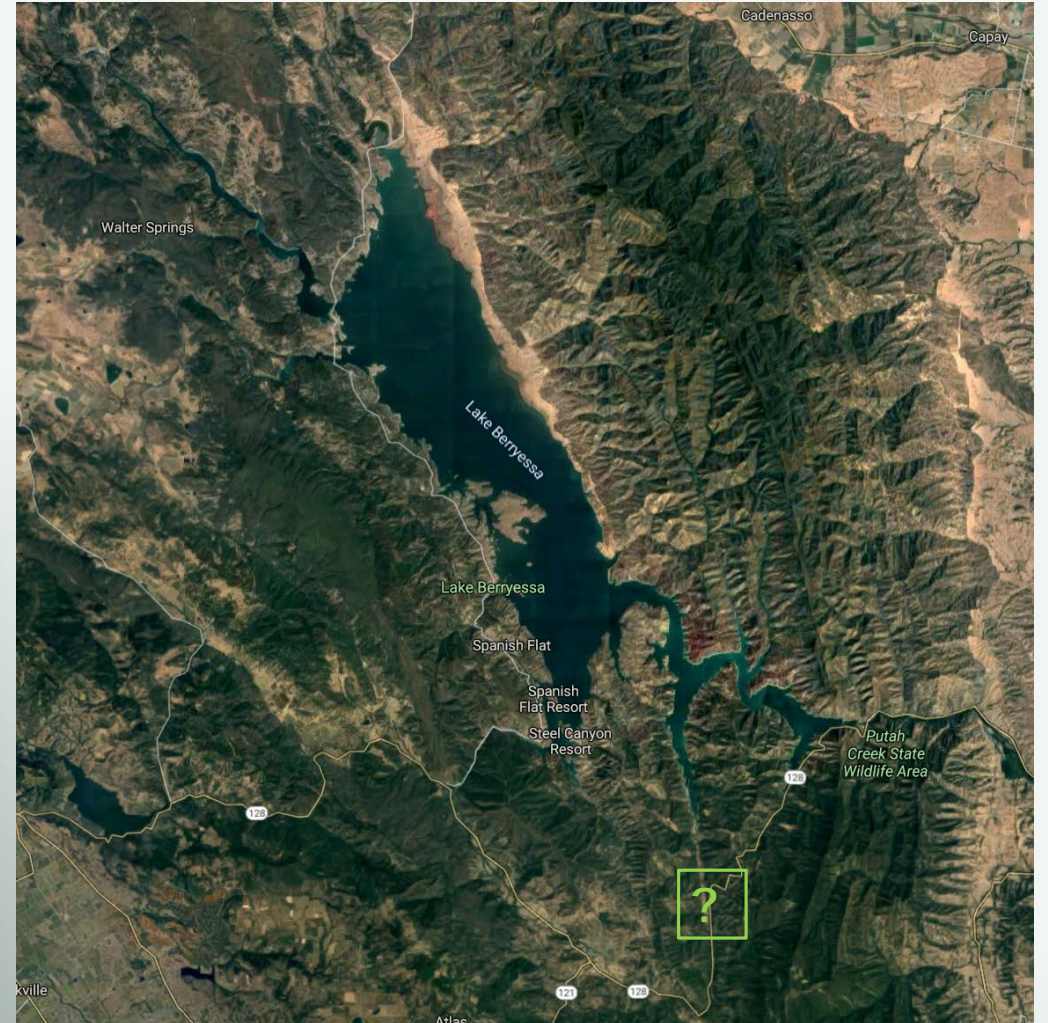


FUTURE PLANS

- Continuation of the Mussel Prevention Program
- Continual updates of monitoring and activities to remain in compliance

Challenges/ Opportunities

- Permanent Decon Station
- Jurisdiction and Partners





THANK YOU!

QUESTIONS ?

Aquatic Invasives / Prevention Plan

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Water Quality Monitoring/ Sanitation Survey

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