

# Eastern Sierra Mussel Prevention Collective





# Outline

- Issues & concerns with mussels (why do we care)
- Regulatory status
- Current monitoring locations & frequency
- Control measures
- Notification protocols
- Proposed framework
- Ask



## Caveats

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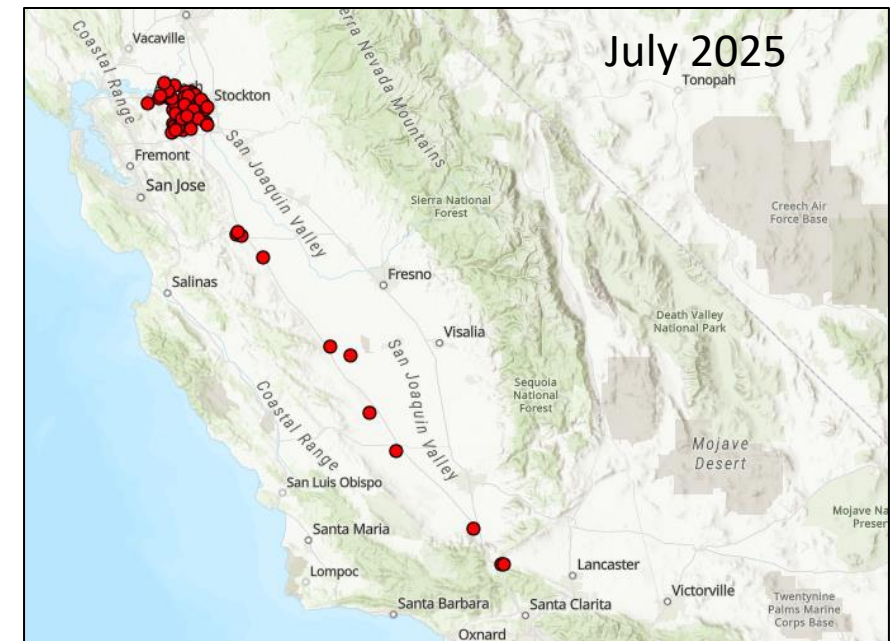
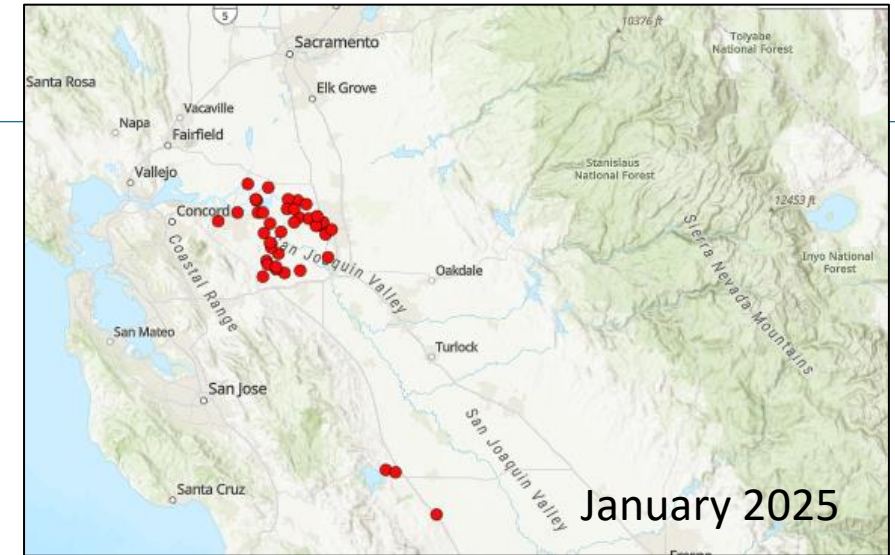
- Evolving threat
- Extrapolating science and evidence from other areas
- Ultimately, the only way we know is if they get here





# Golden Mussel Introduction

- Detected in October 2024
- First documented sighting in U.S.
- Similar biology and impacts to Dreissenid mussels
- Broader tolerance for salinity, pH, and dissolved oxygen (DO)
- Lower calcium requirements



# Mussel Vulnerability

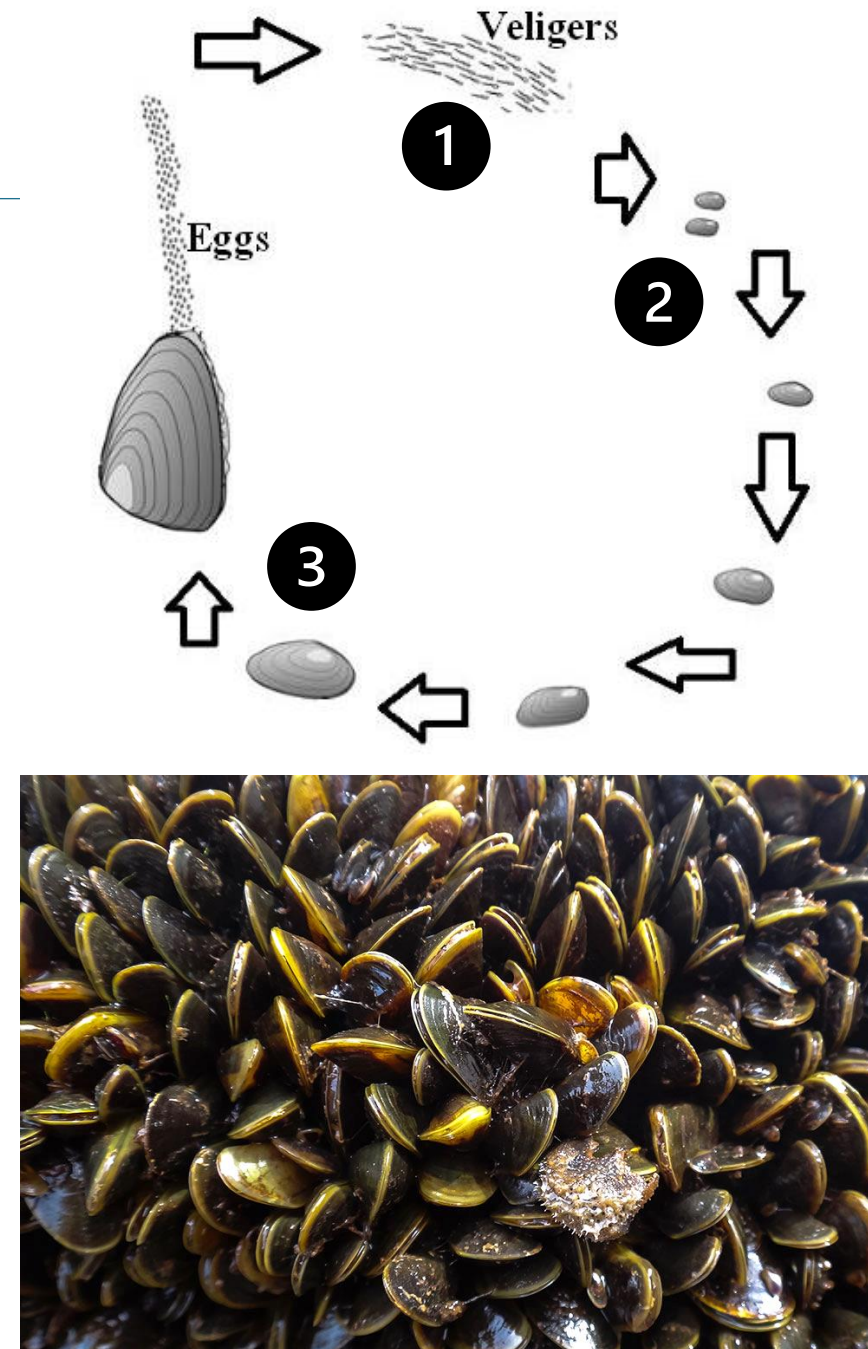


Water Body	Water chemistry supports Dreissenid Mussels?	Water chemistry supports Golden Mussels?
Bridgeport Reservoir	Yes	Yes
Convict Lake	Yes	Yes
Crowley Lake	Yes	Yes
Gull Lake	Yes	Yes
June Lake	Yes	Yes
Lundy Lake	No	Yes
Topaz Lake	No	Yes
Grant Lake	No	Yes
Lake Mamie	No	Yes
Lake Mary	No	Yes
Lower Twin Lake	No	Yes
Trumbull Lake	No	Yes
Twin Lakes (Mammoth)	No	Yes
Uppoer Twin Lake	No	Yes
Virginia Lakes	No	Yes
Lake George	No	Yes
Silver Lake	No	Yes
Diaz Lake	No	Yes
Lake Sabrina	No	No
North Lake	No	No
South Lake	No	No
Rock Creek Lake	No	No

*Vulnerability based on calcium data for waterbodies*

# Golden Mussel Biology

1. Veliger – In water column, not visible to naked eye
  2. Settlers – Settle on surfaces, feel like sandpaper
  3. Adults – up to 1-2 inches in size
- Rapid reproduction and growth rate
  - Filter feeders – consume large amounts of algae





## Issues & Concerns

- Rapid growth rates
- Can grow on hard or sandy substrates
- Clogs infrastructure – pipes, gates, trash racks, etc.
- Extremely difficult to eradicate



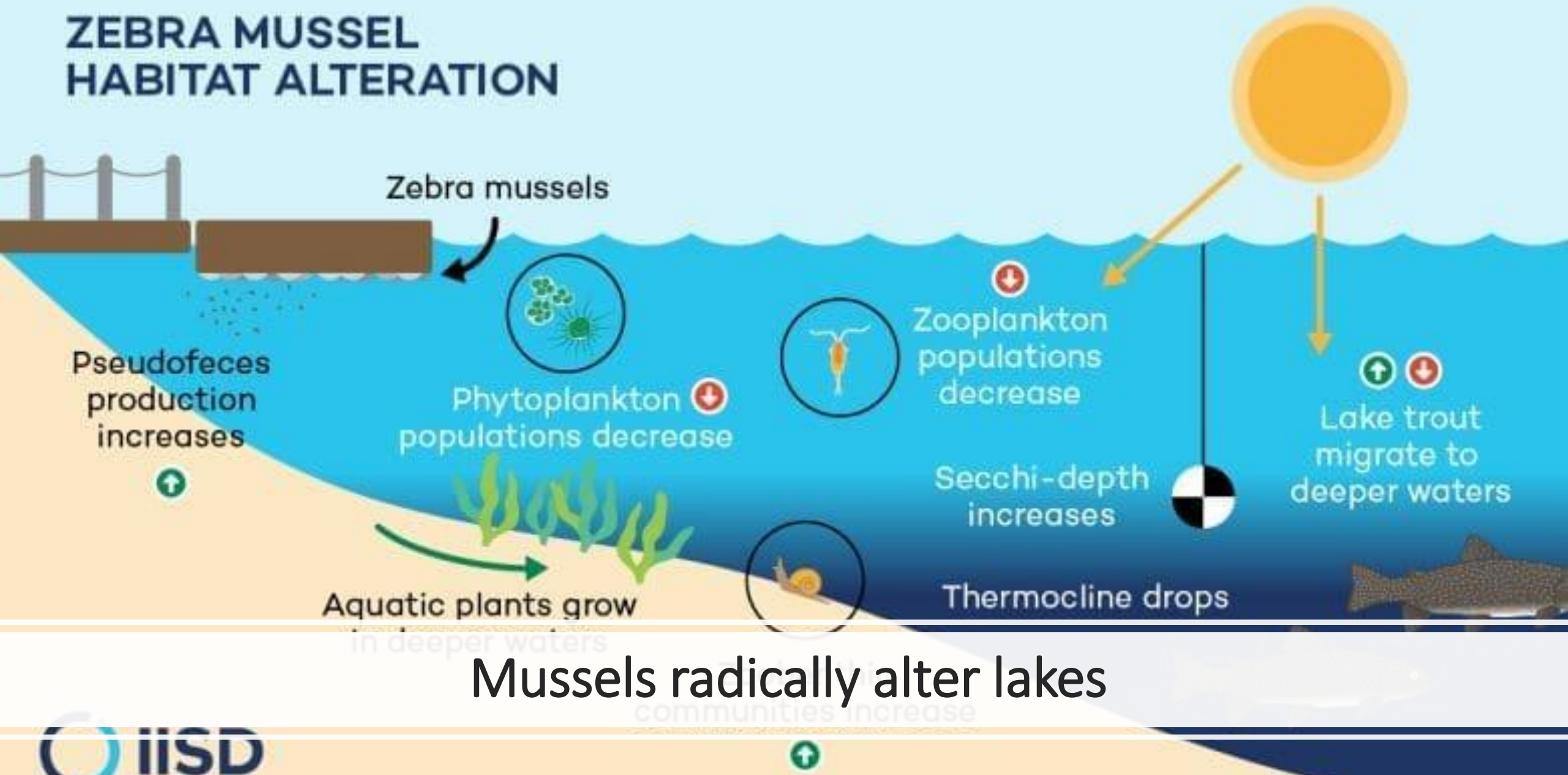


# Infestation progression





# ZEBRA MUSSEL HABITAT ALTERATION



Mussels radically alter lakes



# Mussels decrease trout growth

- Remove the base of the foodweb
- Our fish management is based on fish being able to grow
- We stock a lot of lakes with small fish because they grow well





# There is a way to prevent introduction

- Watercraft Inspection Programs
- Watercraft Decontamination
- Watercraft Inspection and Decontamination Training Available through PSMFC

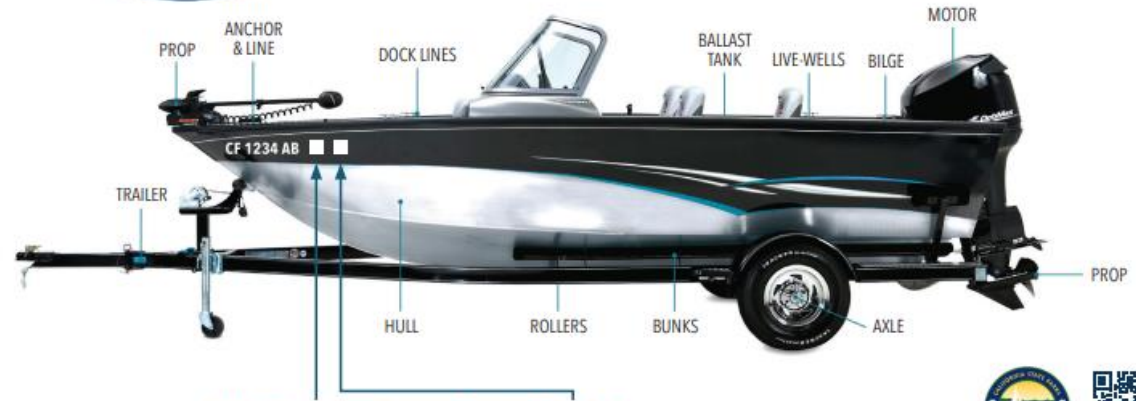
CLEAN | DRAIN | DRY

## Prevent the spread of invasive mussels

**CLEAN** your gear, boat, and trailer before leaving the area. Remove plants, animals, and mud. Dispose of unwanted bait and debris in the trash.

**DRAIN** bilge, ballast, wells, and buckets before you leave the parking area, and never drain back into the waterway.

**DRY** equipment before launching into another body of water. Waiting periods can vary - check with your local waterbody.



Display your **DMV Registration** and **Mussel Fee Stickers** on the hull

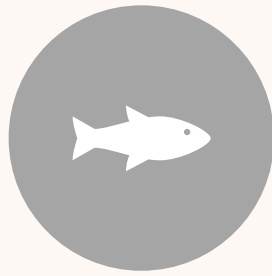




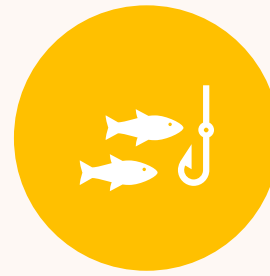
# There is no way to 'undo' an introduction



IMPACTS TO WATER  
INFRASTRUCTURE



IMPACTS TO LAKE  
QUALITY



IMPACTS TO FISHERIES



AN OUNCE OF  
PREVENTION IS WORTH  
A POUND TON OF CURE



# Regulatory status

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- Species is rapidly spreading
- Evolving threat



# Regulatory status

## California Legislation

### **AB 2065** – September 30, 2008

- Requires owners/operators of reservoirs that allow recreation to:
  - Conduct vulnerability assessment
  - Develop and implement plans to prevent introduction of Dreissenid Mussels
  - Conduct monitoring
  - Monitoring requirement also applies to owners of reservoirs that are closed to the public

### **Section 671 Amendment** - December 12, 2024

- Golden mussels added to list of restricted animals
- Fish and Wildlife Commission announced emergency ruling to make it illegal to be in possession of transport Golden Mussels in California
- If found to be in possession, mussels should be euthanized immediately



# What has DWP done so far?

## RISK ASSESSMENT

- Water source
- Environmental conditions

## PREVENTION

- Staff training
- Boater awareness programs
- Boater questionnaires & inspections
- Reservoir access control

## MONITORING

- Substrate sampling
- Veliger collection
- Visual assessment

## Northern Monitoring Locations

Crowley Lake

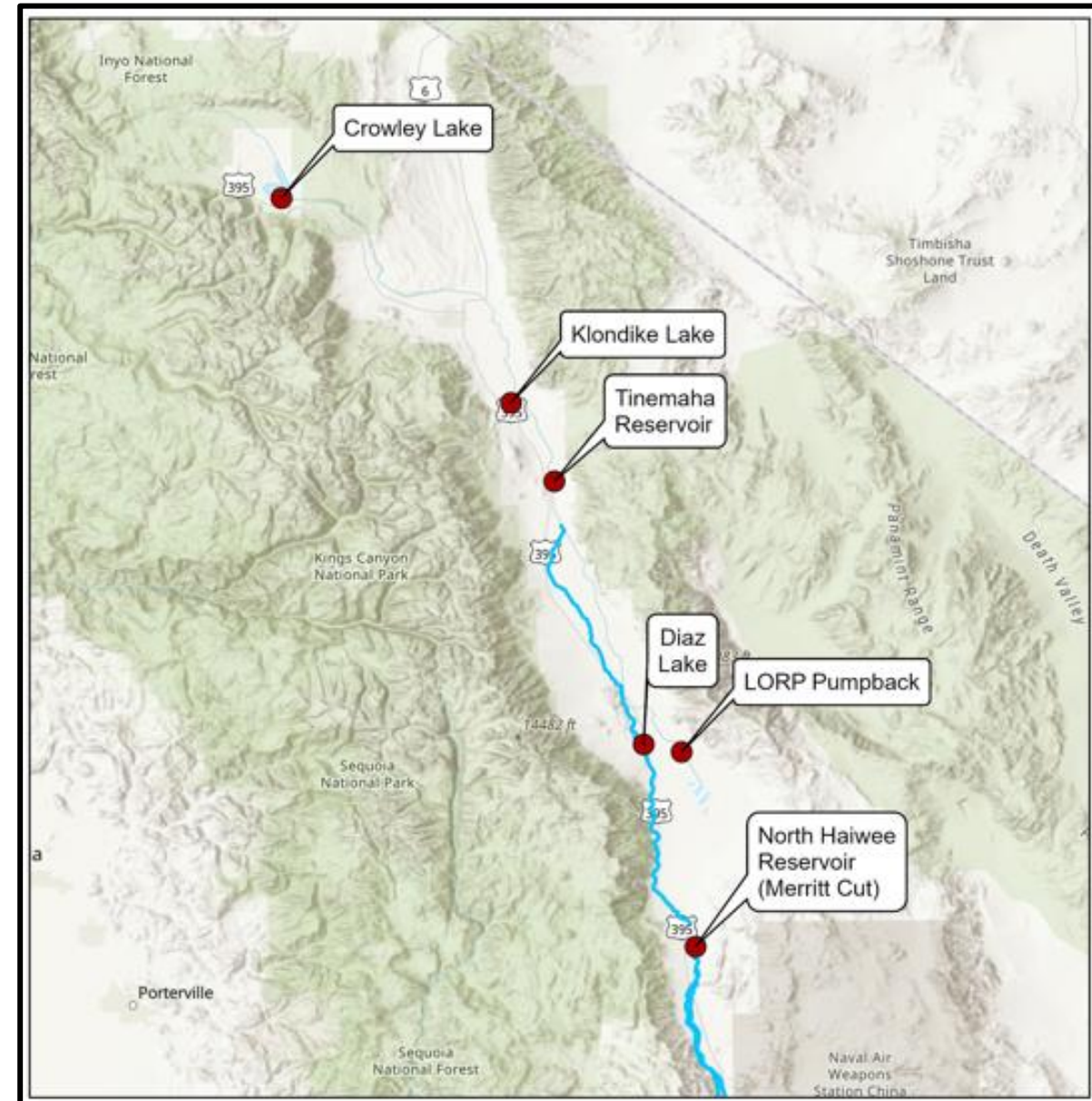
Klondike Lake

Tinemaha Reservoir

LORP Pumpback Station

Diaz Lake

North Haiwee Reservoir (Merritt  
Cut)





# What has CDFW done so far?

## RISK ASSESSMENT

- Water source
- Environmental conditions

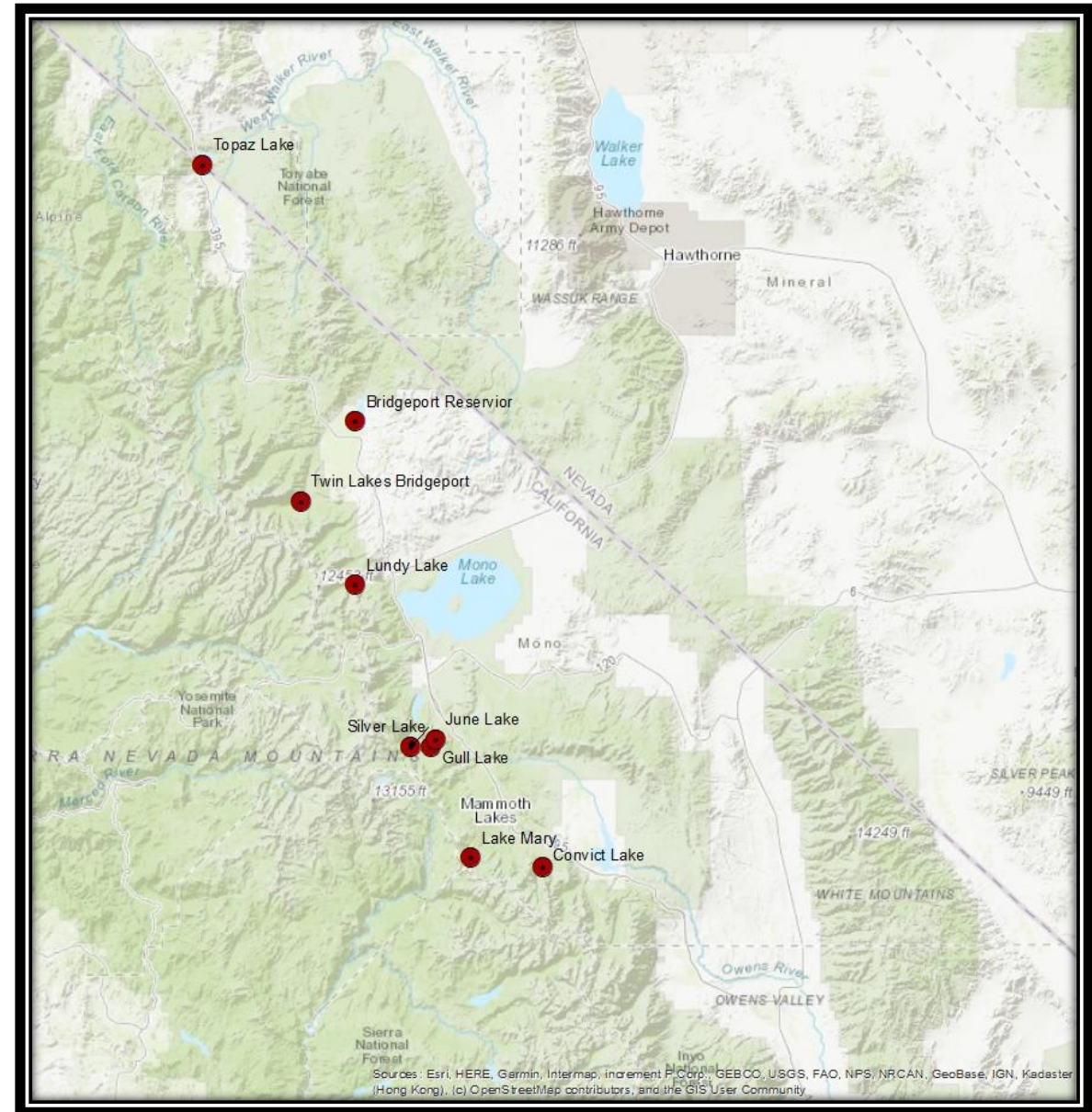
## PREVENTION

- Boater awareness programs

## MONITORING

- Substrate sampling
- Veliger collection
- Visual assessment

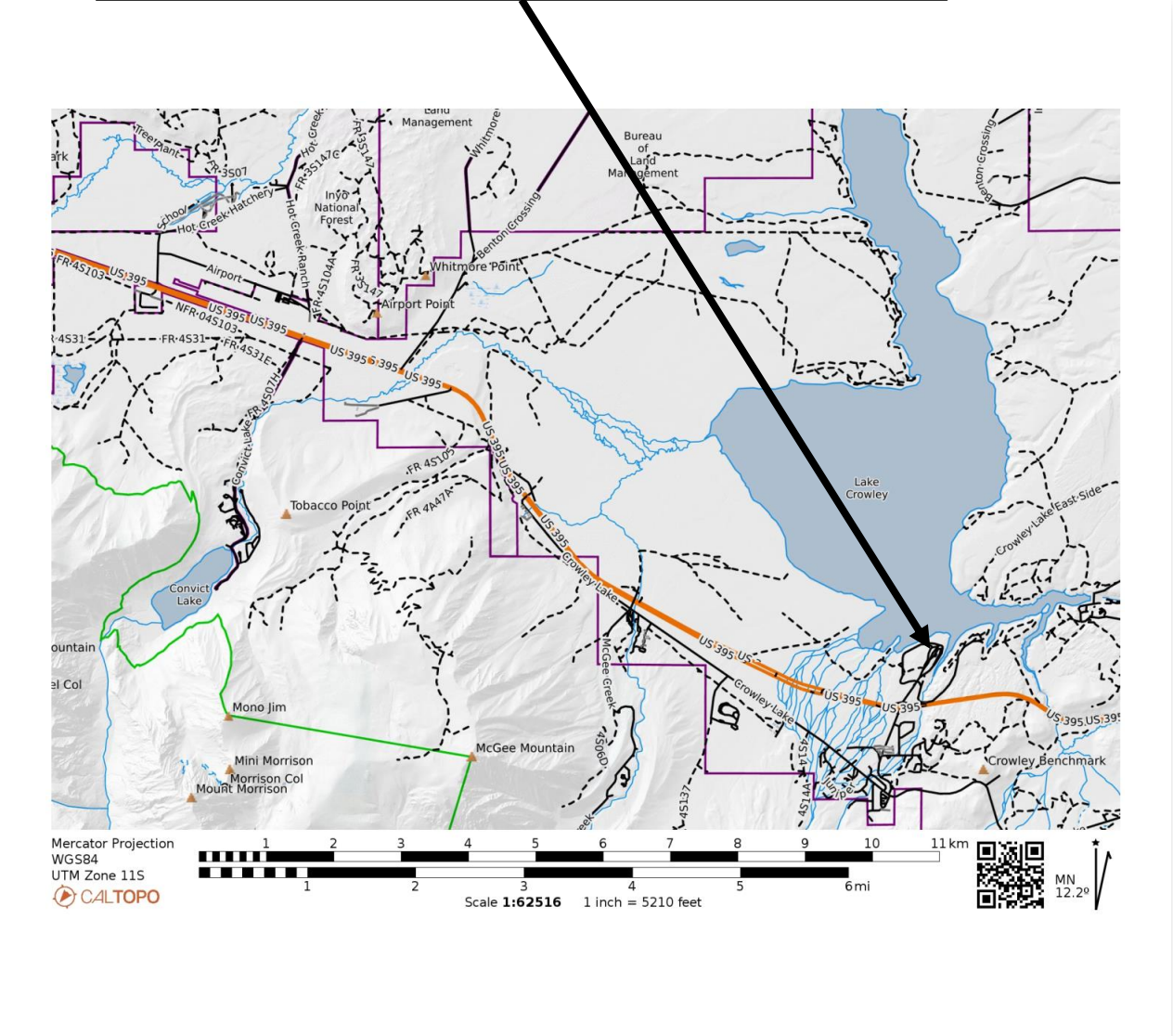
# CDFW Monitoring Locations





Controlled access, inspections
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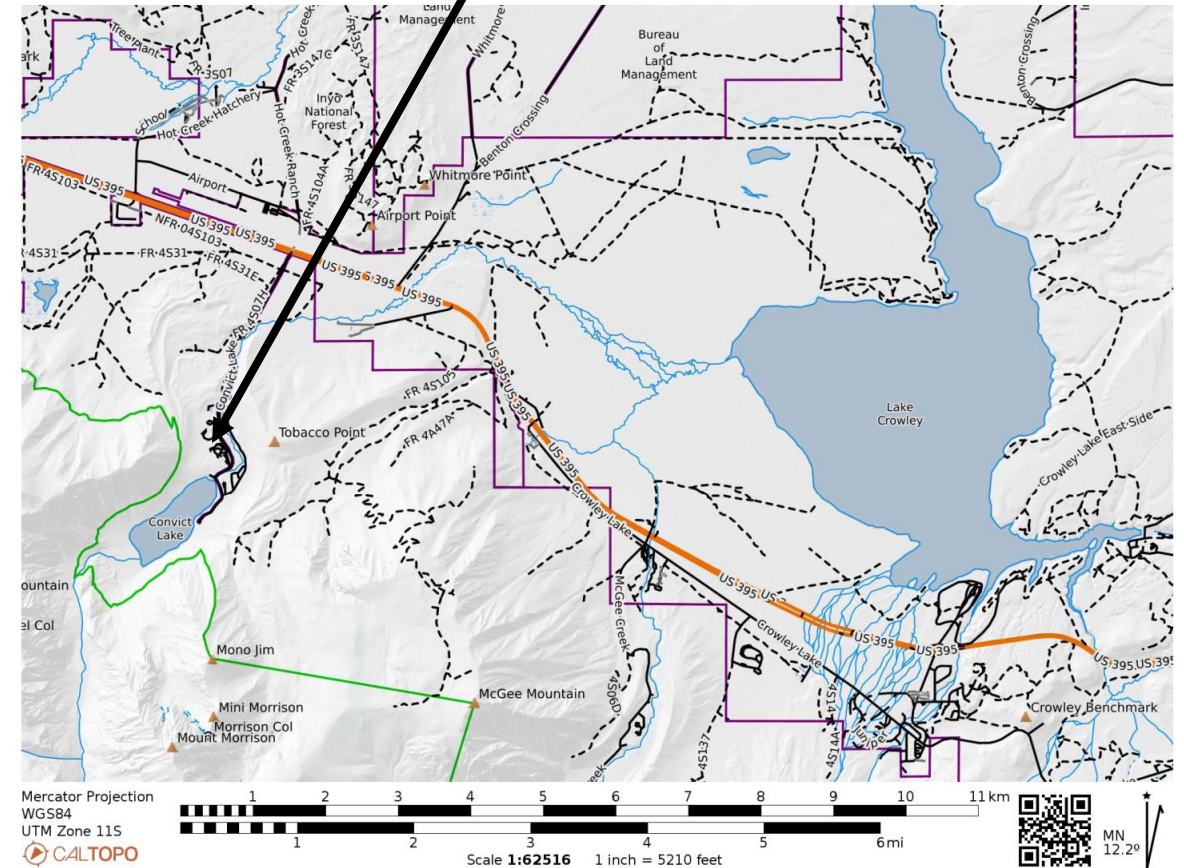
Current  
approach has a  
lot of problems





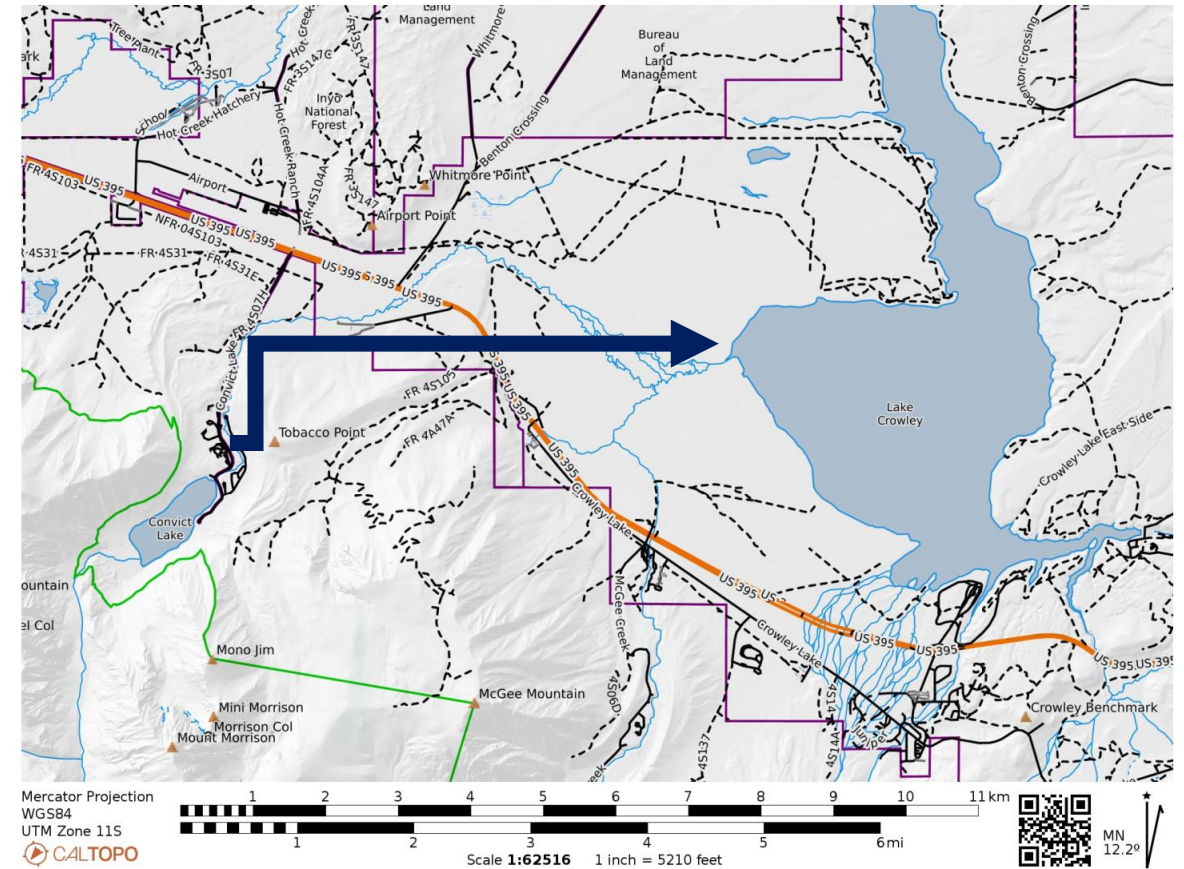
Current  
approach has a  
lot of problems

Unstaffed, signed





Current  
approach has a  
lot of problems



# This is not inevitable in the Eastern Sierra

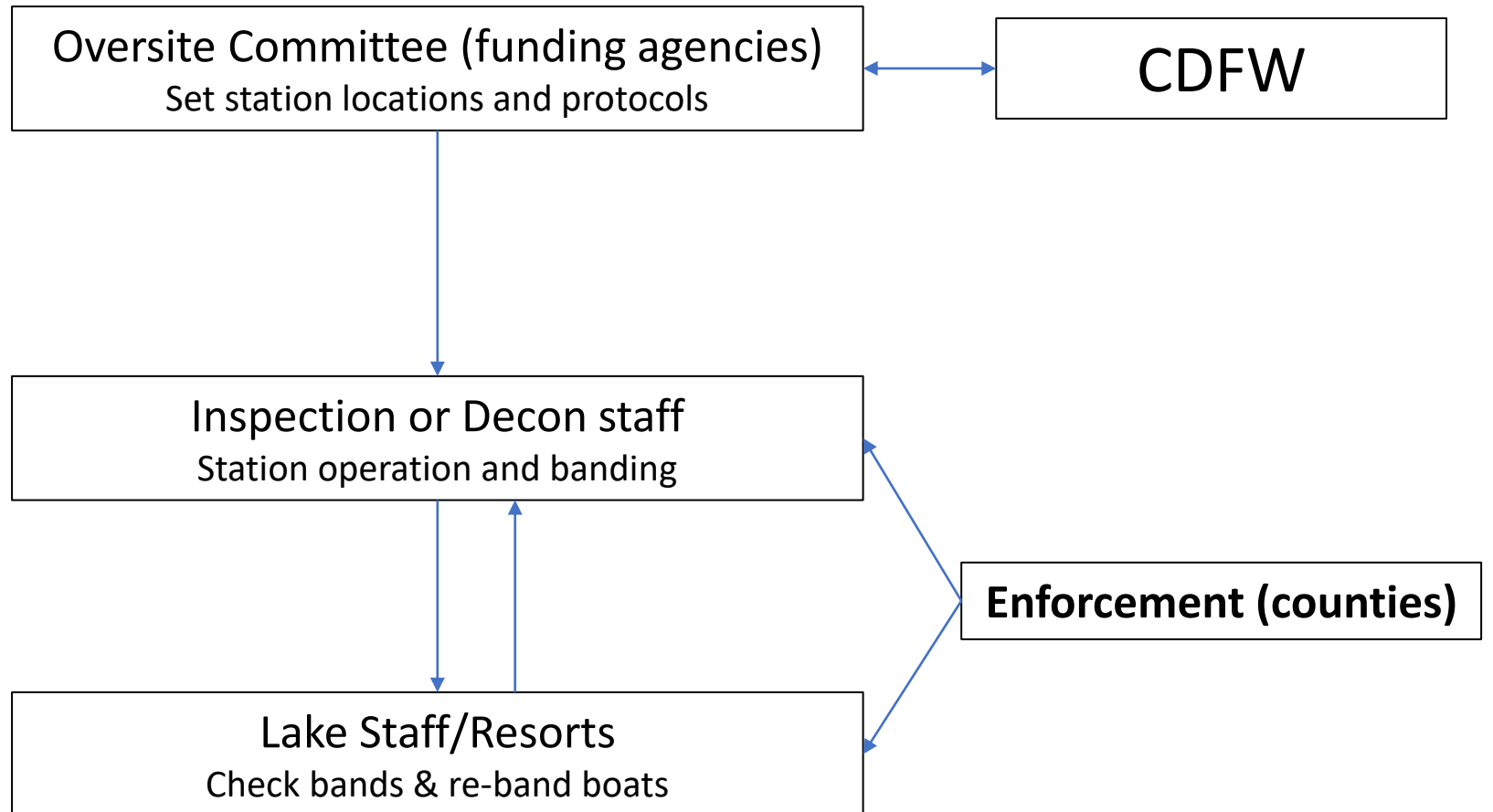
- We have not detected them yet
- There is no hydrologic connection





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# Proposed approach





# Labor Day

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- Pilot inspections
- Funded by DWP and INF, with support from Inyo County and Mono County.
  - ESF staff



# We are asking counties to require banding

- State Code doesn't address GM's, but provides authority to mussel inspections, quarantines and closures
- Interim approach needed by local agencies
  - Federal managers can't make up rules to enforce



Questions



Los Angeles  
Department of  
Water & Power



# Dreissenid Mussel Prevention Plans

- Quagga and Zebra Mussels
- Fish and Game Code 2302
- 14 CCR §672.1 (b)
- Who is required to have a prevention plan?
  - Reservoir (Water Code §6004.5)
  - Open for public recreation
  - Not infested with Dreissenid mussels
- For waters not required to have a prevention plan, CDFW supports any education and outreach efforts to prevent the introduction of invasive mussels.



*CDFW, Surface Survey, 2024*

# Golden Mussel Parameters for Survival/Reproduction

Golden Mussels	Survive		Reproduce	
Reported Values	Lowest	Highest	Lowest	Highest
Calcium (mg/L)	< 3	-	5	-
Salinity (ppt)	0	> 15	0	5
Temperature (°F)	41	95	61	82