



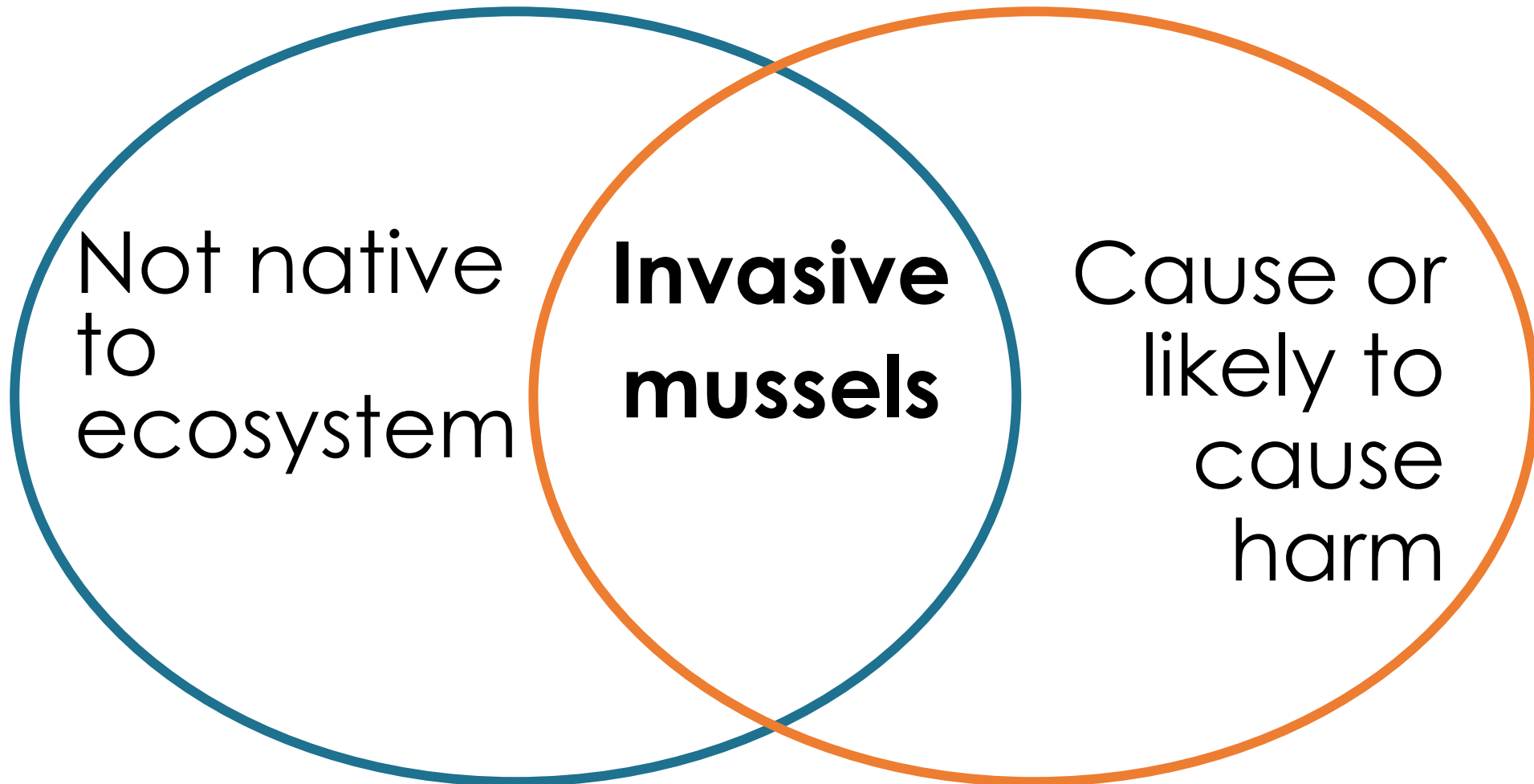
DWR

# SPOTLIGHT ON GOLDEN MUSSELS

**PRESENTED BY:**

Thomas Jensen, California Department of Fish and Wildlife  
October 29, 2025

# What makes a mussel species “invasive”?

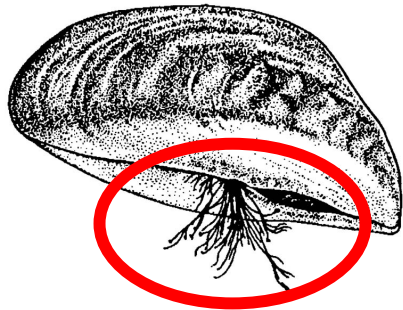




# Invasive Mussels

## Description

- Fresh/brackish water bivalves
- Byssal threads firmly attach
- Not larger than 2"
- Solid color or striped
- Wide environmental tolerances



**GOLDEN MUSSEL**



**QUAGGA MUSSEL**



**ZEBRA MUSSEL**

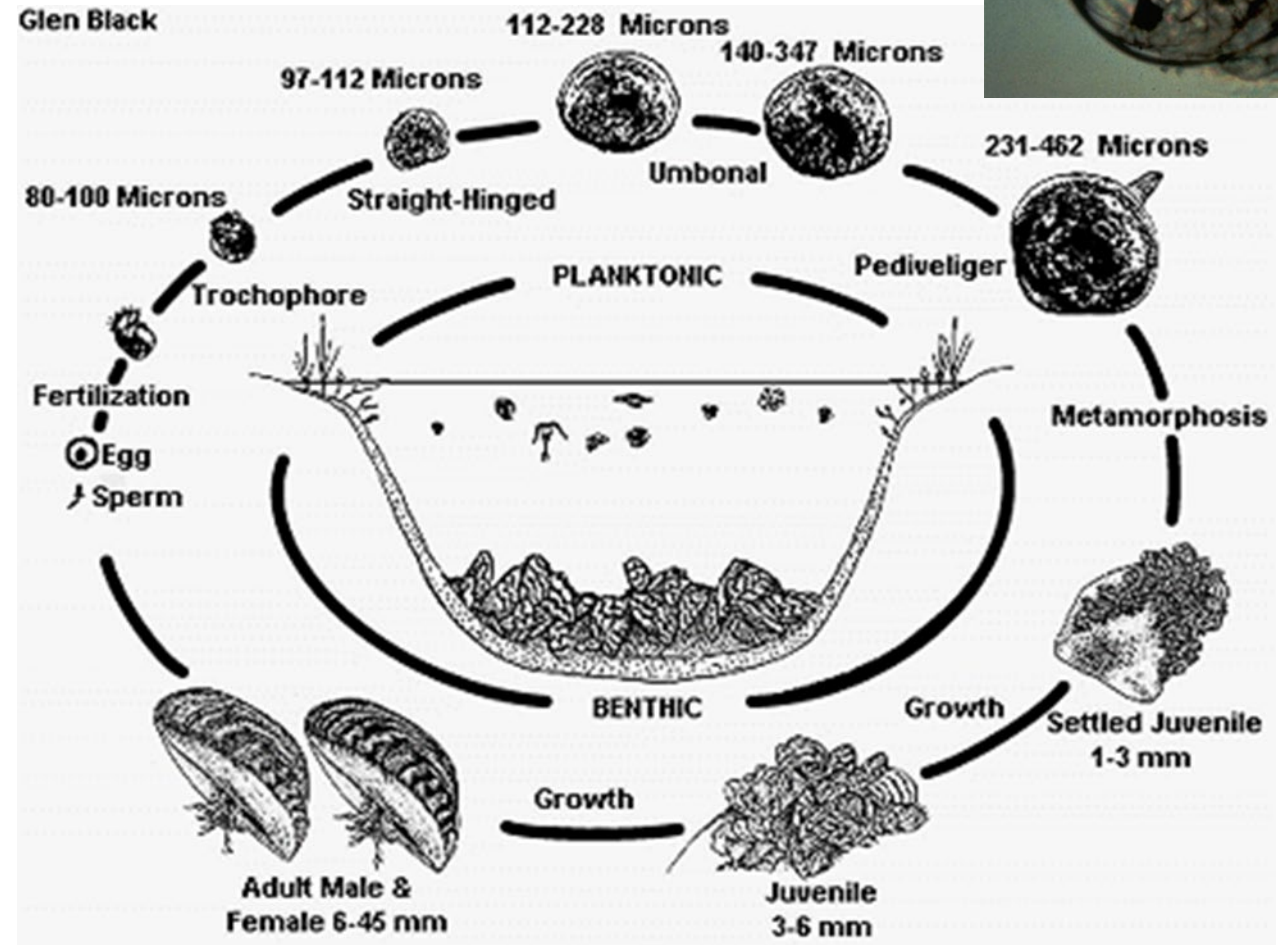
# Lifecycle

## Adult

- Lifespan 2-4 years
- Broadcast spawners
- High reproductive potential

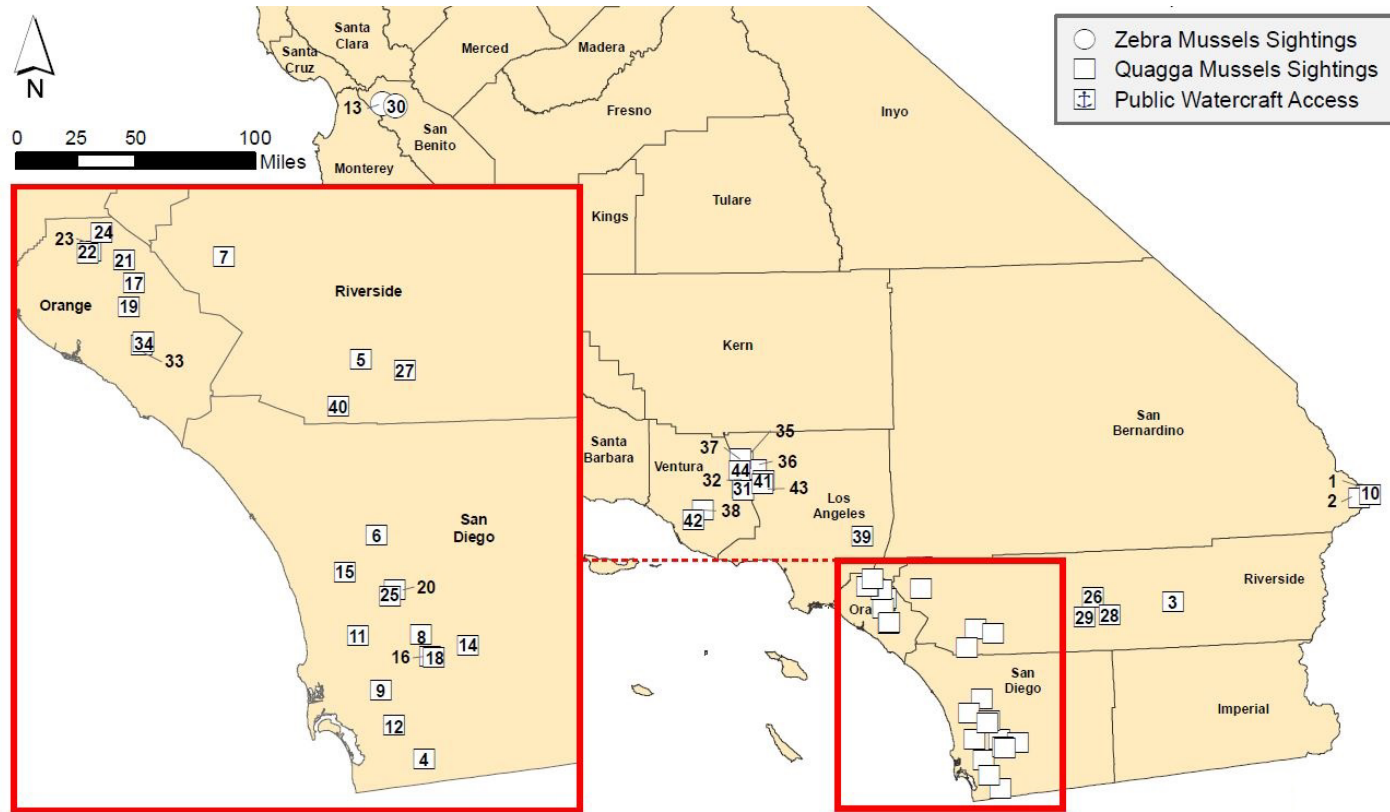
## Larvae (veliger)

- Free-floating plankton
- Rate of development depends on water temperature (2-4 weeks)





# Dreissenid Mussels



Dreissenid mussel distribution in CA,  
10/16/2025



Quagga mussel (top)  
Zebra mussel (bottom)



# Golden Mussels

- Native to China and SE Asia
- Nonindigenous to Hong Kong, Japan, South America
- Wider calcium, temperature, salinity, and substrate tolerances
- Nearly all California fresh and brackish waters are suitable for establishment



*DWR monitoring equipment, Oct 2024*

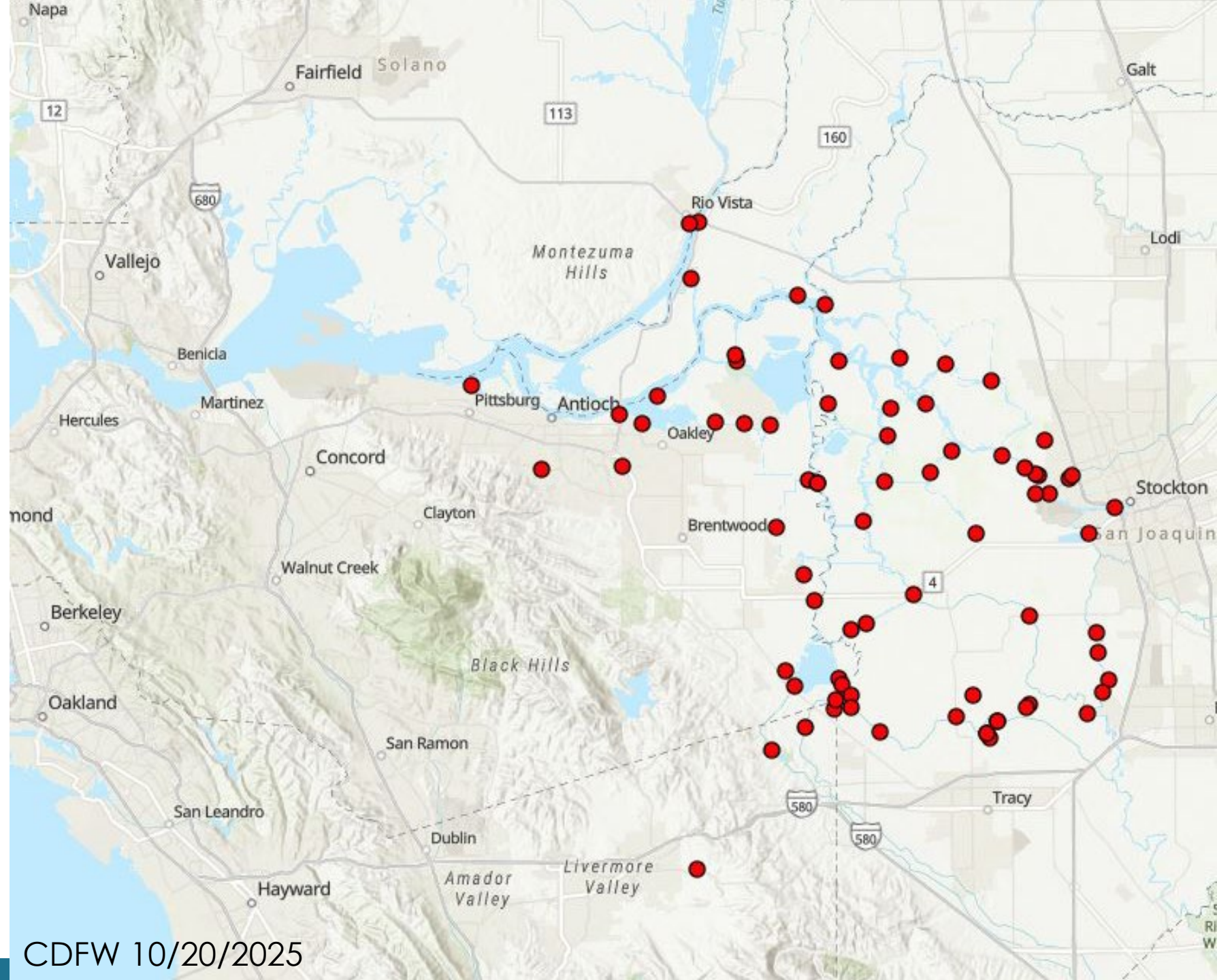


# Statewide Golden Mussel Detections

- Sacramento-San Joaquin Delta
- State Water Project



# Golden Mussel Delta Detections



CDFW 10/20/2025



# Impacts

- Environment
  - Species, communities, system-wide health
  - Recreation
- Infrastructure
  - Dams
  - Pumping Plants
  - Hydropower
- Public Safety
  - Flood control
  - Fire protection
  - Water quality and security
- Economic



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# DWR Acoustic Doppler Current Profiler

Stockton  
Deepwater  
Shipping  
Channel



Mussel-free Oct 2024; encrusted Aug 2025



After golden mussels removed (DWR)



# Louver's at DWR's Skinner Fish Facility



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# Delta Watercraft



California State Parks, DBW



California State Parks, DBW



# Aquatic Plants



California State Parks, DBW



California State Parks, DBW

# Pathways of Introduction

- Water Flow
- Motorized Watercraft (adults or veligers)
- Non-motorized Watercraft (adults or veligers)
- Construction Activities
- Commercial Activities
- Recreationalists
- Fish production and stocking
- Professionals working in aquatic environments

\*Not an exhaustive list



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# Golden Mussel Task Force & Priorities

- Steering Committee
- Teams
- Response Framework
- Coordination
- Prevention at uninfested waters
- Delineation in Delta
- Statewide monitoring
- Outreach and education
- Research supporting management actions and facility protection

State of California

## GOLDEN MUSSEL RESPONSE FRAMEWORK

California Department of Fish and Wildlife  
California State Parks  
California Department of Water Resources  
California State Lands Commission  
California Department of Food and Agriculture  
California State Water Resources Control Board  
United States Bureau of Reclamation  
United States Fish and Wildlife Service

April 14, 2025

# Science and Capacity Building

- Maintaining a list of research needs
- Work in progress:
  - Veliger identification
  - Veliger survival in entrapped water
  - Lethal conditions (hot water and drying; temps and duration)
  - Salinity tolerance
  - Copper toxicity
  - Zequanox toxicity



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# Outreach Material

**DON'T MOVE A MUSSEL**

Clean, Drain, and Dry  
to Protect California Waters

**GOLDEN MUSSEL**

**QUAGGA MUSSEL**

**ZEBRA MUSSEL**

[www.wildlife.ca.gov/Invasives](http://www.wildlife.ca.gov/Invasives) | 866-440-9530

**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

Labels: TRAILER, HULL, ROLLERS, BUNKS, AXLE, ANCHOR & LINE, DOCK LINES, BALLAST TANK, LIVE WELLS, BILGE, MOTOR, PROP.

**CLEAN DRAIN DRY**

Invasive mussels are a threat to our waters, recreational opportunities, and the health of the environment.

You could unknowingly be carrying them on your watercraft and gear. Take action to protect California waters.

**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

To learn more about invasive mussels and other species, visit [www.wildlife.ca.gov/Invasives](http://www.wildlife.ca.gov/Invasives)

**INVASIVE MUSSEL INFESTED WATER**

**CLEAN, DRAIN, DRY YOUR WATERCRAFT AND GEAR**

Boater “Rack card” and Signs

# A New Reality

- Understand environmental impacts
- Prevent further spread
- Contain/control existing populations
- Assess vulnerable infrastructure





# Questions | Contact

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