



Eastern Sierra Golden Mussel Update

Outline

- Review of environmental constraints
- Potential impacts to Eastern Sierra
- Potential vectors for invasion
- Current distribution in California
- Proposed approach to lower the risk

Review: Golden Mussel

- 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



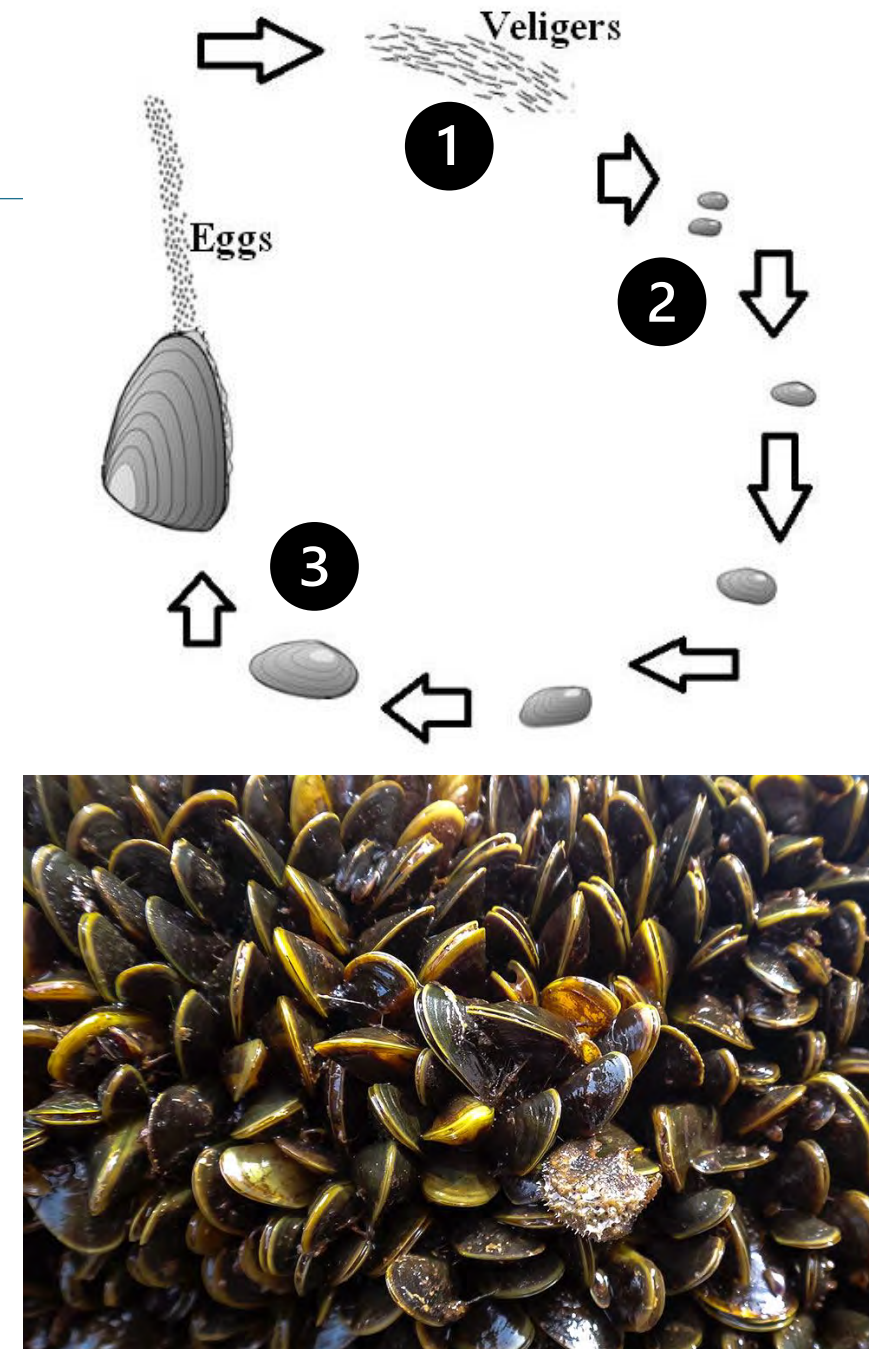
Golden Mussel Biology

Broadly tolerant and able to adapt to local waters

Complicated life history, with different tolerances

Rapid reproduction and growth rate

Filter feeders – consume large amounts of algae



Golden Mussel Biology

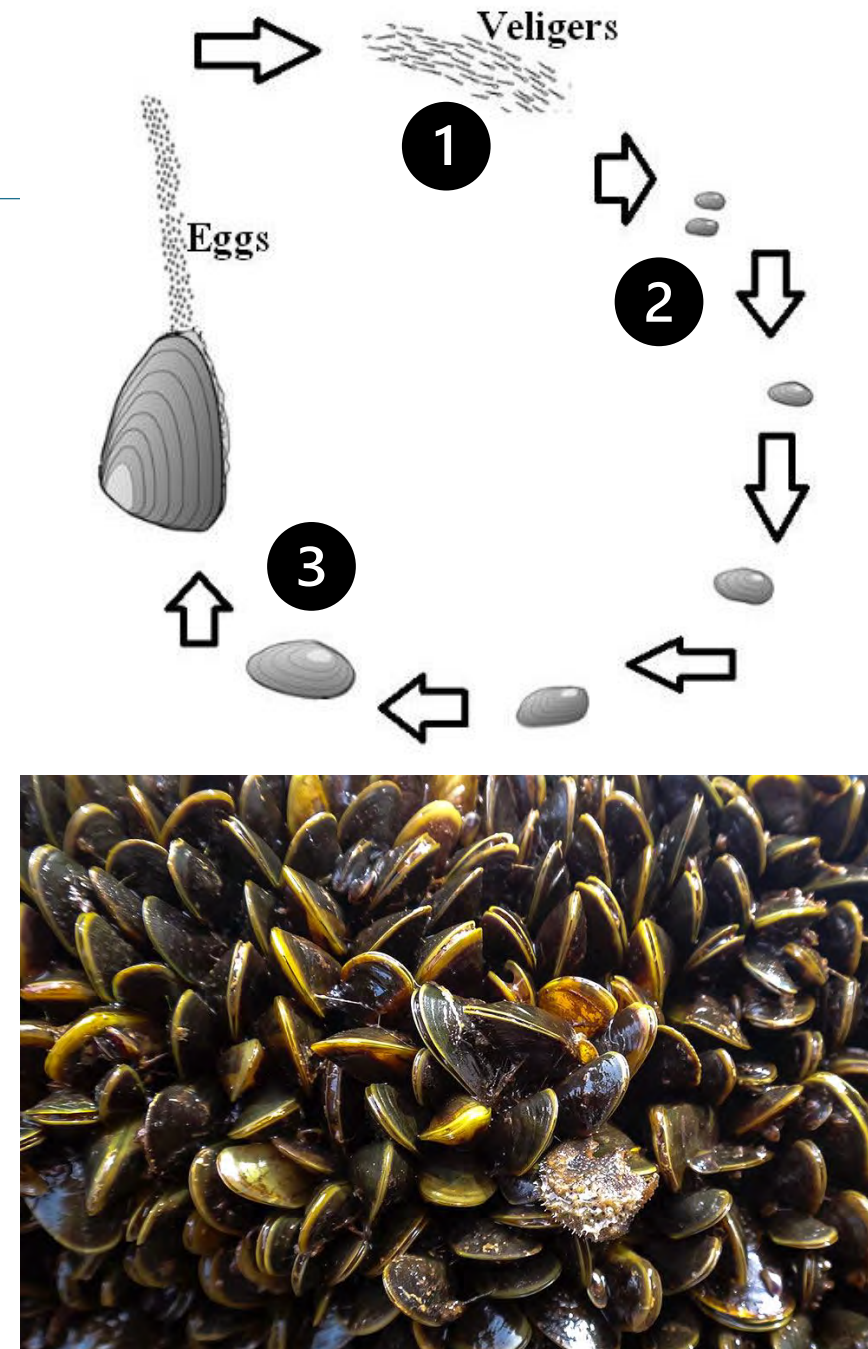
Veliger – In water column, not visible to naked eye



Settlers – Settle on surfaces, feel like sandpaper



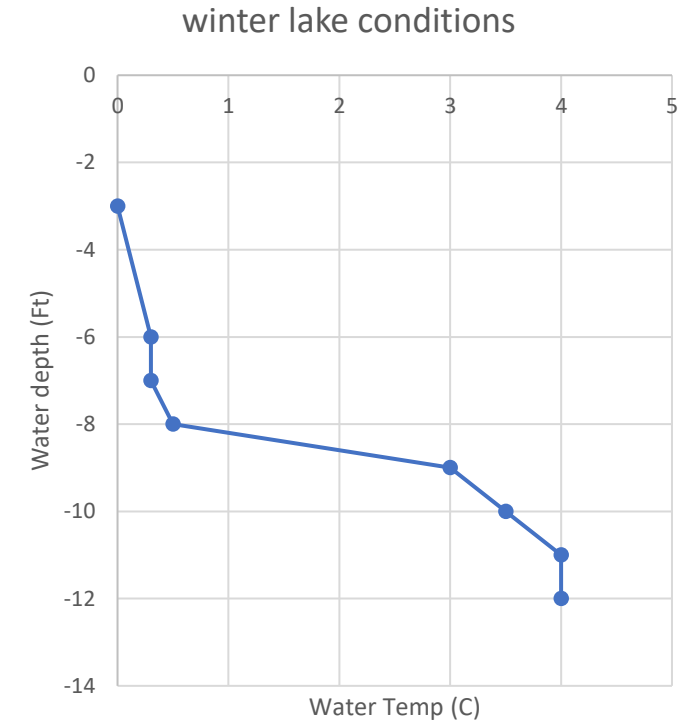
Adults – up to 1-2 inches in size



Golden Mussel Biology

Reproduction (veliger and settlers): 16-28 C (60-82 F); about 5 mg/L Calcium

Survival: 4-32 C (39- 90 F); around 3 mg/L Calcium



*USGS; CDFW; Oliveira, M.D et al. (2011)

Mussel potential

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

Issues & Concerns



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

Economic impacts

\$1 billion/year in the United States

Large cost increases for municipal water systems, power generation, irrigation system maintenance

Loss of property values to water-front homes

Loss of recreational availability and access

**Caveat- hard to quantify*



There is no way to 'undo' an introduction

'You can rebuild from wildfire, but you can't remove mussels.' —John Wentworth

Vectors for introduction

- Water management
- Boating



There is a way to prevent introduction

- Watercraft Inspection Programs
- Watercraft Decontamination

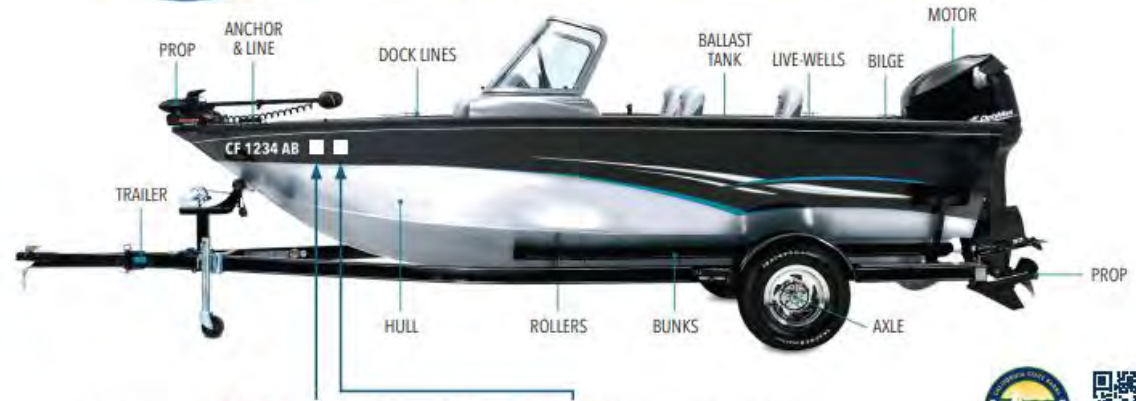
CLEAN | DRAIN | DRY

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



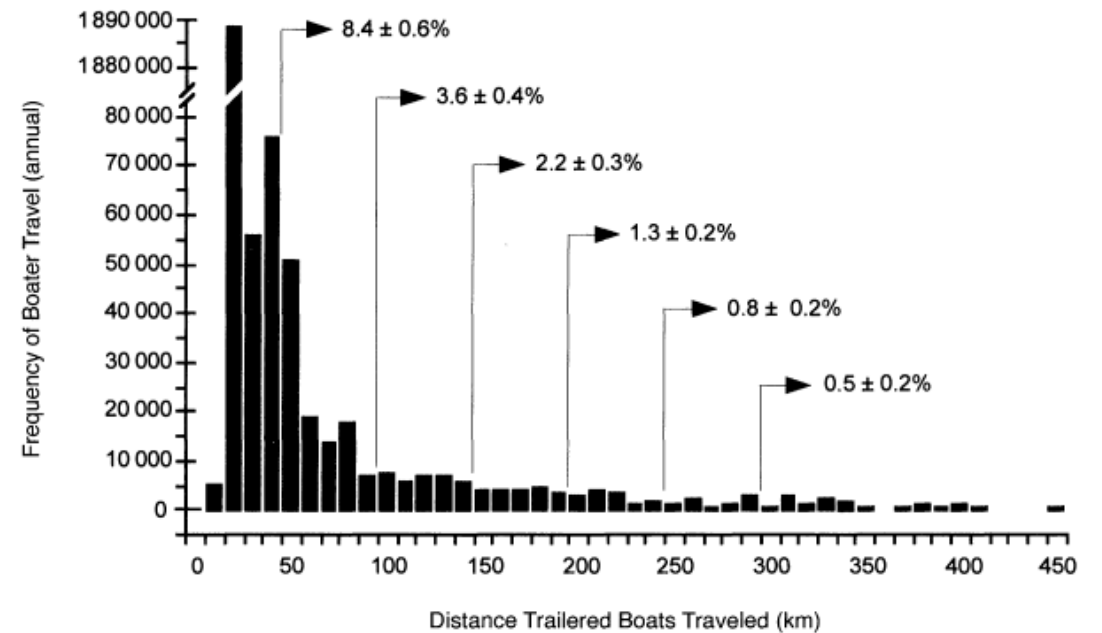
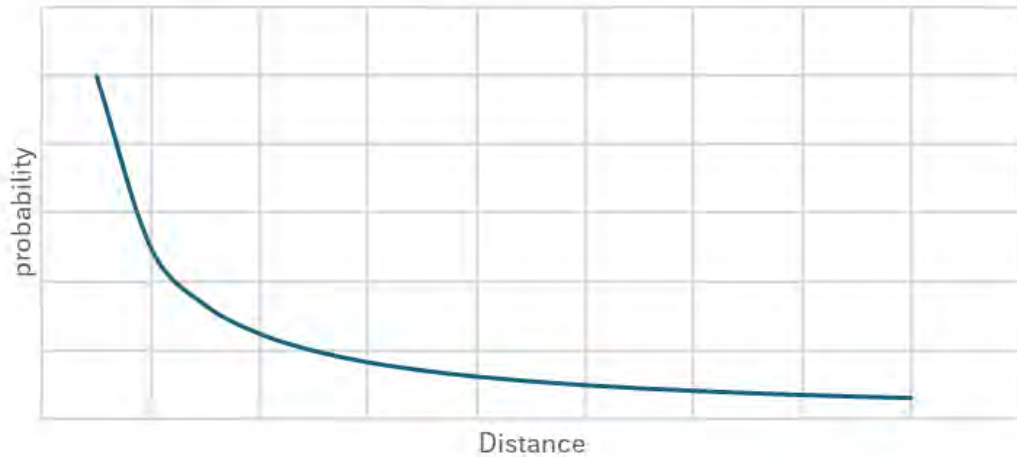
Mussel potential

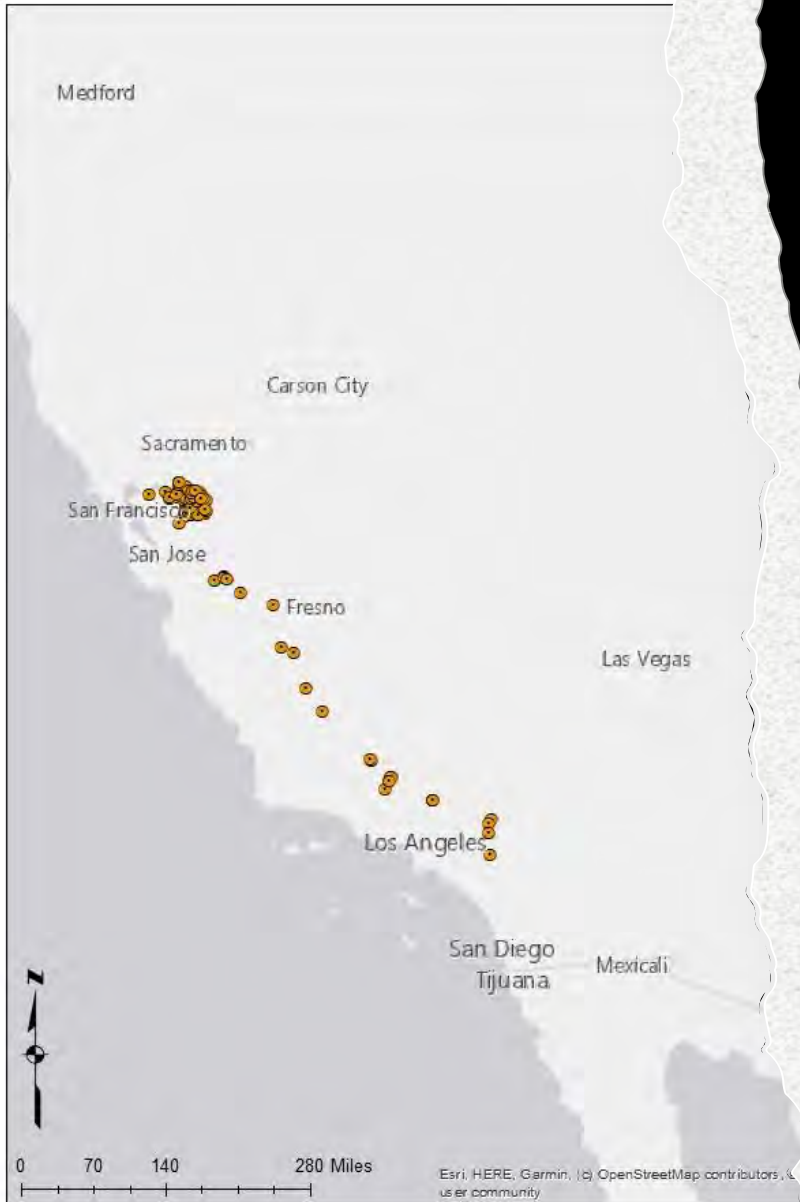


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Change in landscape risk

Conceptual probability of transporting invasive species

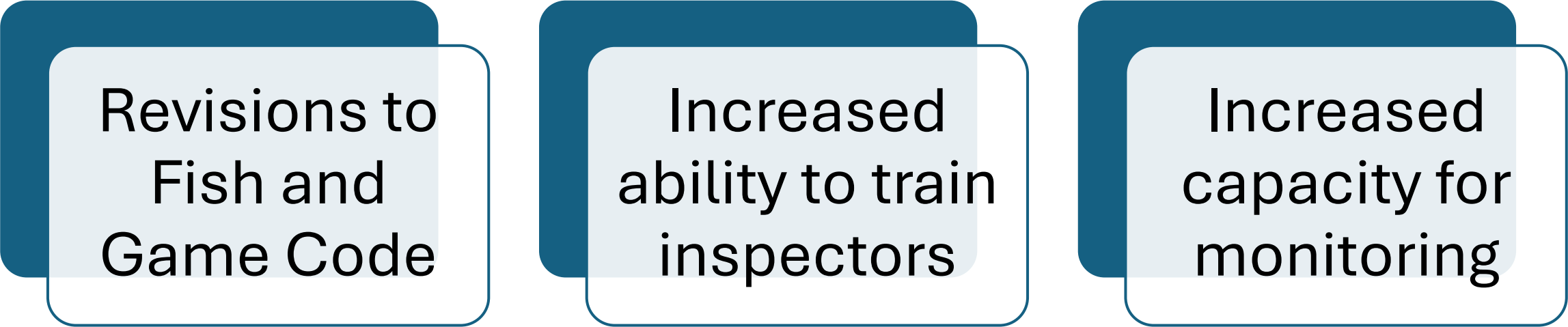




Current Distribution

(first detected in October 2024)

State of the state



Revisions to
Fish and
Game Code

Increased
ability to train
inspectors

Increased
capacity for
monitoring

State of the state

Not proposing
regional inspection
stations or check
points

No state push to
stop boating

Focus on
increasing local
capacity to
respond

Proposed approach



Proposed approach

- Engage counties on inspection requirements for trailered watercraft.
- Scope regional inspection program
- Develop budget
- Create outreach team to build support and voluntary compliance



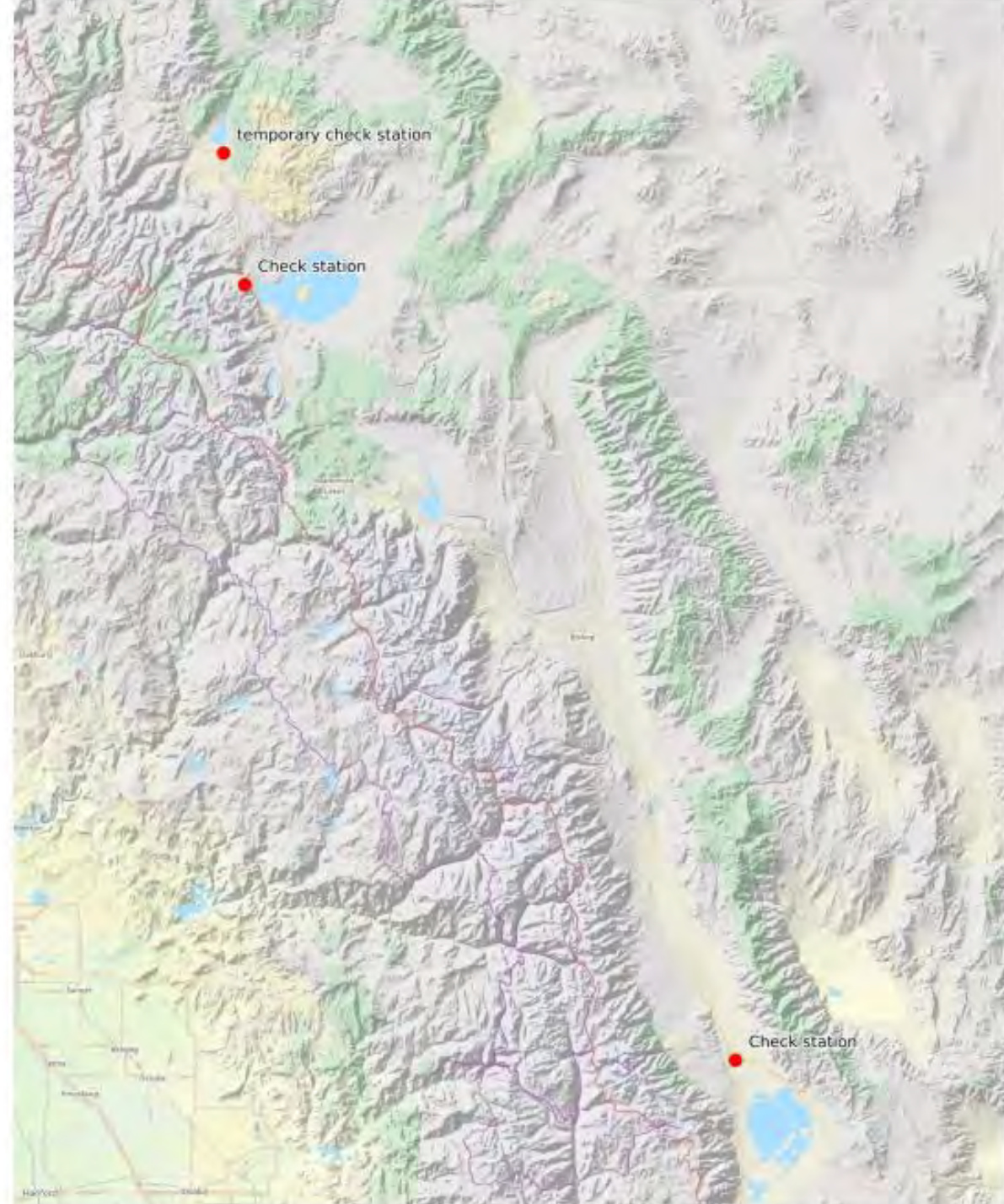
Proposed approach

- **Engage counties to move forward to inspection requirements for trailered watercraft.**
 - **Looking into ‘stickering’ program similar to Tahoe and Lake Counties**
 - **Color-coded sticker (changed monthly) affixed to trailers on all watercraft**
 - **Risk management/mandatory education**
- Scope regional inspection program
 - Establish collaborative approach with land managers
 - Determine appropriate places for inspection stations
- Develop budget
 - Propose staffing and implementation contract with ESF
 - Secure start up funds for decontamination units
- Create outreach team to build support and voluntary compliance



Proposed approach

- Engage counties to move forward to inspection requirements for trailered watercraft.
- **Scope regional inspection program**
 - **Establish collaborative approach with land managers**
 - INF and DWP supportive
 - **Determine appropriate places for inspection stations**
 - **3 proposed**
- Develop budget
 - Propose staffing and implementation contract with ESF
 - Secure start up funds for decontamination units
- Create outreach team to build support and voluntary compliance



Proposed approach

- Engage counties to move forward to inspection requirements for trailered watercraft.
- Scope regional inspection program
 - Establish collaborative approach with land managers
 - Determine appropriate places for inspection stations
- **Develop budget**
 - **Propose staffing and implementation contract with ESF**
 - **\$60,000 Annual labor and operating budget (staff and environmental DNA monitoring)**
 - **Secure start up funds for decontamination units
~\$500,000 in grant funds applied for**
- Create outreach team to build support and voluntary compliance



Proposed approach

- Engage counties to move forward to inspection requirements for trailered watercraft.
- Scope regional inspection program
 - Establish collaborative approach with land managers
 - Determine appropriate places for inspection stations
- Develop budget
 - Propose staffing and implementation contract with ESF
 - Secure start up funds for decontamination units
- **Create outreach team to build support and voluntary compliance**
 - **Caltrout, TU, MLTPA, Bishop Piute Tribe**
 - **Focus on voluntary compliance as opposed to threat of enforcement**



WRID ask

- Assistance with restricting access points
- Assistance with funding
- Assistance with education



Questions