DON PEDRO HYDROELECTRIC PROJECT
FERC NO. 2299

AMENDMENT OF APPLICATION

EXHIBIT E – ENVIRONMENTAL REPORT

APPENDIX E-4
AQUATIC INVASIVE SPECIES MANAGEMENT PLAN



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September 2017

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List of Acronyms

ac .....acres
AFLA .....Amendment to the Final License Application
AIS .....Aquatic Invasive Species
BLM .....U.S. Department of the Interior, Bureau of Land Management
CCFS .....City and County of San Francisco
CDFG .....California Department of Fish and Game (as of January 2013, CDFW)
CDFW .....California Department of Fish and Wildlife
ft .....feet
FLA .....Final License Application
Districts .....Turlock Irrigation District and Modesto Irrigation District
DPRA .....Don Pedro Recreation Agency
FERC .....Federal Energy Regulatory Commission
MID .....Modesto Irrigation District
M&I .....Municipal and Industrial
NGVD .....National Geodetic Vertical Datum
NEPA .....National Environmental Policy Act
PM&E .....Protection, Mitigation, and Enhancement
TID .....Turlock Irrigation District

PREFACE

On April 28, 2014, the co-licensees of the Don Pedro Hydroelectric Project, Turlock Irrigation District (TID) and Modesto Irrigation District (MID) (collectively, the Districts), timely filed with the Federal Energy Regulatory Commission (Commission or FERC) the Final License Application (FLA) for the Don Pedro Hydroelectric Project, FERC No. 2299. As noted in the filing and acknowledged by FERC at the time, several studies were ongoing which were likely to inform the development of additional protection, mitigation, and enhancement (PM&E) measures. The Districts have now completed these studies and herein submit this Amendment of Application (Amendment to the Final License Application or AFLA). For ease of review and reference, this AFLA replaces the Districts' April 2014 filing in its entirety.

The Don Pedro Project provides water storage for irrigation and municipal and industrial (M&I) use, flood control, hydroelectric generation, recreation, and natural resource protection (hereinafter, the "Don Pedro Project"). The environmental analysis contained in this AFLA considers all the components, facilities, operations, and maintenance that make up the Don Pedro Project and certain facilities proposed to be included under the new license. The Don Pedro Project is operated to fulfill the following primary purposes and needs: (1) to provide water supply for the Districts for irrigation of over 200,000 acres of Central Valley farmland and M&I use, (2) to provide flood control benefits along the Tuolumne and San Joaquin rivers, and (3) to provide a water banking arrangement for the benefit of the City and County of San Francisco (CCSF) and the 2.6 million people CCSF supplies in the Bay Area. The original license was issued in 1966. In 1995, the Districts entered into an agreement with a number of parties, which resulted in greater flows to the lower Tuolumne River for the protection of aquatic resources.

Hydroelectric generation is a secondary purpose of the Don Pedro Project. Hereinafter, the hydroelectric generation facilities, recreational facilities, and related operations will be referred to as the "Don Pedro Hydroelectric Project," or the "Project". With this AFLA to FERC, the Districts are seeking a new license to continue generating hydroelectric power and implement the Districts' proposed PM&E measures. Based on the information contained in this AFLA, and other sources of information on the record, FERC will consider whether, and under what conditions, to issue a new license for the continued generation of hydropower at the Districts' Don Pedro Project. The Districts are providing a complete description of the facilities and operation of the Don Pedro Project so the effects of the operation and maintenance of the hydroelectric facilities can be distinguished from the effects of the operation and maintenance activities of the overall Don Pedro Project's flood control and water supply/consumptive use purposes.

Being able to differentiate the effects of the hydropower operations from the effects of the flood control and consumptive use purposes and needs of the Don Pedro Project will aid in defining the scope and substance of reasonable PM&E alternatives. As FERC states in Scoping Document 2 in a discussion related to alternative project operation scenarios: "…alternatives that address the consumptive use of water in the Tuolumne River through construction of new structures or methods designed to alter or reduce consumptive use of water are…alternative mitigation strategies that could not replace the Don Pedro *hydroelectric* [emphasis added] project. As such, these recommended alternatives do not satisfy the National Environmental

Policy Act (NEPA) purpose and need for the proposed action and are not reasonable alternatives for the NEPA analysis."

1.0 INTRODUCTION

Turlock Irrigation District and Modesto Irrigation District (collectively, the Districts) are the co-licensees of the 168-megawatt Don Pedro Hydroelectric Project (the Project) located on the Tuolumne River in western Tuolumne County in the Central Valley region of California. This document presents the Aquatic Invasive Species Management Plan (the Plan) for the Don Pedro Project, which is intended to provide guidance for preventing the introduction and establishment of aquatic invasive species in Don Pedro Reservoir.

1.1 General Description of the Don Pedro Project

Don Pedro Dam is located on the Tuolumne River at river mile 54.8 and the Don Pedro Reservoir, formed by the dam, extends 24 miles upstream at the normal maximum water surface elevation of 830 feet above mean sea level (NGVD 29). At elevation 830 feet, the reservoir stores over 2,000,000 acre-feet of water and has a surface area slightly less than 13,000 acre-feet. The watershed above Don Pedro Dam is approximately 1,533 square miles.

The current Project Boundary extends from approximately one mile downstream of the dam to approximately river mile 80.8 upstream of the dam. Upstream of the dam, the Project Boundary runs generally along the 845-foot contour interval. The top of the Don Pedro Dam is at elevation 855 feet. The current Project Boundary encompasses approximately 18,370 acres with 74 percent of the lands owned jointly by the Districts and the remaining 26 percent (approximately 4,802 acres) owned by the United States and administered as a part of the U.S. Bureau of Land Management Sierra Resource Management Area.

The primary Project facilities include the 580-foot-high Don Pedro Dam and Reservoir completed in 1971; a four-unit powerhouse situated at the base of the dam; related facilities including the Project spillway, outlet works, and switchyard; four dikes (Gasburg Creek Dike and Dikes A, B, and C); and three developed recreational facilities (Fleming Meadows, Blue Oaks, and Moccasin Point Recreation Areas). The location of the Project and its primary facilities is shown in Figure 1.1-1.

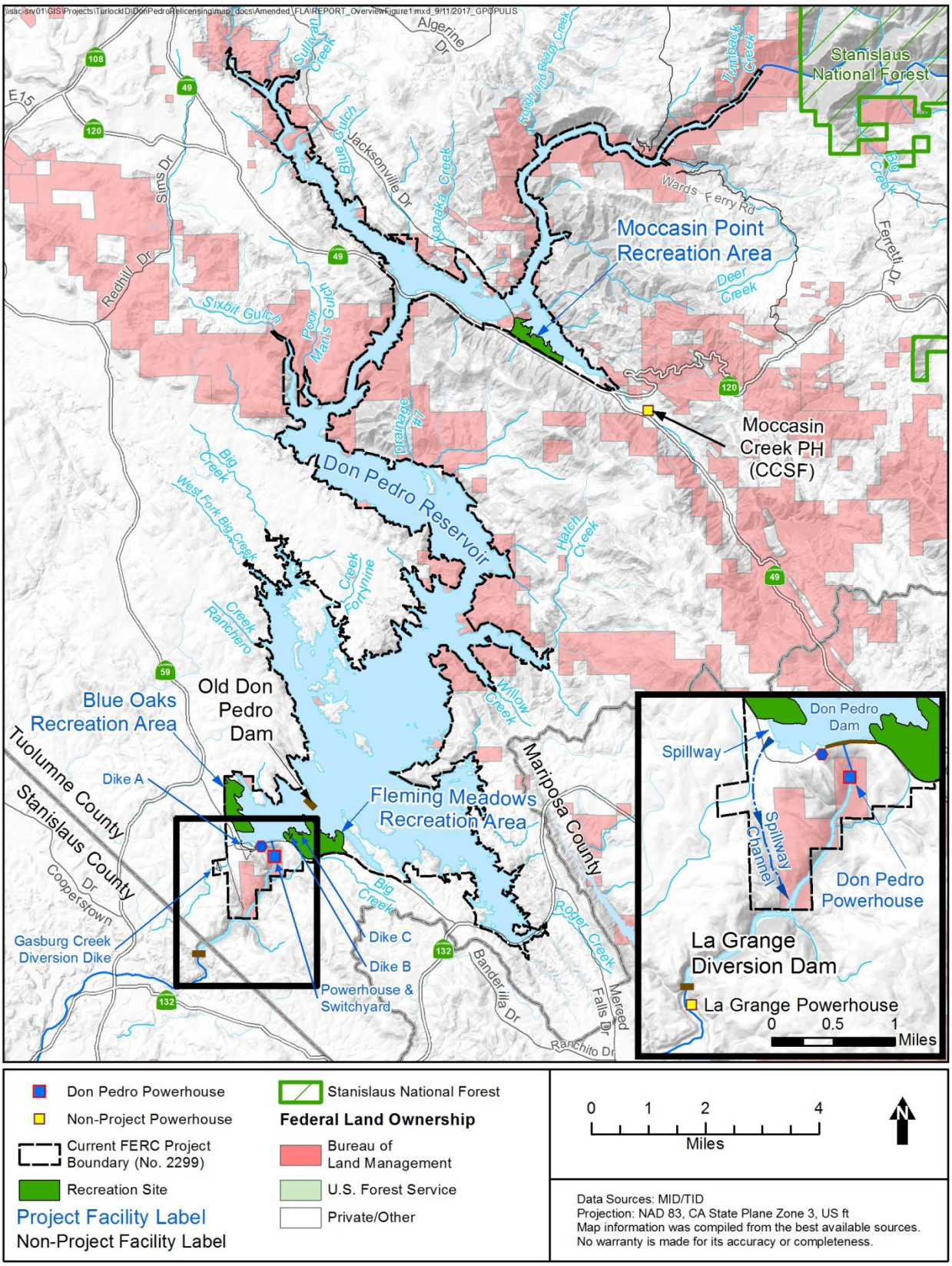

Figure 1.1-1. Don Pedro Project site location map.

2.0 AQUATIC INVASIVE SPECIES MANAGEMENT

2.1 AIS in the Central Valley

Invasive species are defined by the National Invasive Species Council as "species that are non-native to the ecosystem under consideration, and whose introduction causes, or is likely to cause, economic or environmental harm, or harm to human health." Eradication or control of aquatic invasive species (AIS), once they are established, is often difficult or impossible to achieve. As such, AIS are best addressed by preventing their introduction into vulnerable ecosystems and, if introductions occur, responding quickly before the species become established (CDFG 2008).

Based on current species distributions and vectors, and potential impact if established, the Districts conclude that AIS of greatest concern in the Central Valley are two species of dreissenid mussel, the quagga mussel (*Dreissena rostriformis bugensis*) and zebra mussel (*D. polymorpha*) (California Resources Agency 2008), and the New Zealand mudsnail (*Potamopyrgus antipodarum*). To date, none of these species have been documented in Don Pedro Reservoir or in the Tuolumne River watershed.

California Fish and Game Code 2302 states that "any person, agency, district, or authority that owns or manages a reservoir that is open for public recreation and not infested with dreissenid mussels (e.g. quagga and zebra mussels) must 1) assess the vulnerability of the reservoir to introduction of dreissenid mussels, and 2) develop and implement a program to prevent the introduction of dreissenid mussels." Based on low calcium concentrations, Cohen (2008) ranked sites on the Tuolumne River upstream and downstream of Don Pedro Reservoir as "not vulnerable to colonization" by zebra mussel and quagga mussel. As a result, the Districts conclude that the overall vulnerability of Don Pedro Reservoir to the introduction of dreissenid mussels is low. The Districts' program to prevent introductions is described below; these methods are consistent with prevention guidelines for dreissenid mussels (California Resources Agency 2008) and California's Aquatic Invasive Species Management Plan (CDFG 2008), and are also expected to assist in the prevention of other AIS, including New Zealand mudsnail.

2.2 Current AIS Management Activities

The Districts participate in the State of California's program to reduce the spread of AIS by providing information to educate recreational users on ways to reduce the spread of invasive species. This information is provided at boat launches on the Don Pedro Reservoir, the Don Pedro Recreation Agency (DPRA) headquarters building[1] and the DPRA website, describing the DPRA mandatory boater self-inspection permit program. Under this program, all boaters are required to complete a Mussel Self-Inspection Launch Certification Permit form and certify that their boats are cleaned, drained, and dry prior to launching into Don Pedro Reservoir (Attachment A). In particular, the form requires boaters to certify that their boats and trailers have not been in AIS-infested waters (unless thoroughly washed and allowed to dry for 5-30

[1] The DPRA headquarters building overlooking Don Pedro Dam burned to the ground in 2016. The Districts are developing plans and designs for a new headquarters building located closer to Fleming Meadows Recreation Area.

days), are free of plants, animals and mud, and are completely dry, including engine, engine cooling system, live wells, and bilges.

2.3 Proposed AIS Management Activities

2.3.1 Prevention and Education

The Districts will continue their existing AIS prevention program of mandatory mussel self-inspection and associated signage at DPRA boat launches.

2.3.2 Best Management Practices

The Districts will conduct their routine operation and management activities consistent with the objective of minimizing the potential for the introduction and spread of AIS. Specifically, the Districts will develop and implement best management practices for Project-related activities including activities performed by the Districts or contractors that may have the potential to introduce or spread AIS. Examples of such activities include in-water repair or construction work. Best management practices will include the following:

- Identify AIS that may be introduced by the activity.
- Implement preventive measures for AIS with potential to be introduced by the Districts or the Districts' contractors.
- Identify critical control points for prevention of AIS with potential to be introduced or spread.
- Identify actions that will be taken if an introduction of AIS occurs during the activity.

2.4 Consultation

If AIS are detected within Don Pedro Reservoir, or if the Districts are informed by the U.S. Department of the Interior, Bureau of Land Management (BLM) or CDFW of significant AIS-related threats that are not currently addressed by the Districts' prevention and education program, the Districts will confer with these agencies as to appropriate actions and/or program modifications.

Additionally, if significant new information becomes available that changes current understandings on the water chemistry thresholds that support non-native dreissenid mussel species, the Districts will reassess the vulnerability of Don Pedro Reservoir for the introduction of these species, and develop and implement appropriate additional program modifications.

Beginning the second calendar year after license issuance, the Districts will provide CDFW and BLM with a memorandum describing all activities conducted under the Plan during the previous year. If requested by the agencies, the Districts will also convene a meeting or conference call to discuss the memo.

3.0 REFERENCES

California Department of Fish and Game Wildlife (CDFG). 2008. California Invasive Species Management Plan. Online at https://www.wildlife.ca.gov/Conservation/Invasives/Plan.

California Resources Agency. 2008. Invasive mussel guidebook for recreational water managers and users. Available online: http://resources.ca.gov/docs/quagga/081105_Quagga-Zebra_Guidebook.pdf.

Cohen, A.N. 2008. Potential Distribution of Zebra Mussels (*Dreissena polymorpha*) and Quagga Mussels (*Dreissena bugensis*) in California, Phase 1 Report. A Report for the California Department of Fish and Game. June, 2008.

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AQUATIC INVASIVE SPECIES MANAGEMENT PLAN

ATTACHMENT A

DPRA SELF INSPECTION PERMIT FORM

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Don Pedro Recreation Agency
Quagga & Zebra Mussel Prevention Program

MUSSEL SELF-INSPECTION LAUNCH CERTIFICATION PERMIT

Display Permit on Dashboard When Launching

CA Fish & Game Code Sections 2301 & 2302
DPRA Regulations and Ordinances Sections 2.2.1 & 2.2.3

Answer all questions below, complete, sign & date this Permit and place it on the dashboard of your vehicle before launching your vessel.

1. Is your vessel and all equipment **clean** of all mud, dirt, plants, fish or animals and **drained** of all water, including all bilge areas, fresh water cooling systems, lower outboard units, ballast tanks, live-wells, buckets, etc. and completely **dry**? **Yes** __ **No** __

If you answered **No** to question #1, you may not launch your vessel. Your vessel must be **cleaned**, **drained** and completely **dry** before it will be permitted to launch. Do not clean or drain your vessel by the lake or at the launch ramp.

2. If you answered **Yes** to question #1, has your vessel been in any of the infested waters listed on the back page of this form within the last 30 days? **Yes** __ **No** __

If you answered **No** to question #2, you are ready to launch, complete, sign and date this Launch Certification Permit and display it on the dashboard of your vehicle.

3. If you answered **Yes** to question #2, was your boat and trailer thoroughly cleaned and allowed to completely dry for at least 30 days since you last launched, or has it been professionally decontaminated? *(Thoroughly cleaned requires removal of all dirt and organic material from the boat, flushing and draining of all live wells, bilge areas, ballast tanks and fresh water cooling systems. Professional decontamination requires thorough cleaning and flushing with minimum 140° F water.)* **Yes** __ **No** __

If you answered **Yes** to question #3, you are ready to launch, complete, sign and date this Launch Certification Permit and display it on the dashboard of your vehicle.

If you answered **No** to question #3, you may not launch your vessel at Don Pedro Lake. Your vessel must be professionally decontaminated or thoroughly cleaned and allowed to dry for at least 30 days before it will be permitted to launch at Don Pedro Lake.

Quagga and Zebra Mussels Pose a Threat to Don Pedro Lake! Mussels in the lake could disrupt the food chain and fishing, foul docks and ramps, encrust vessels, clog engines, litter the shoreline with sharp and smelly shells, clog water distribution systems and could even result in complete closure of the lake.

I affirm that my vessel does not threaten Don Pedro Lake with Quagga or Zebra mussels.

Please check one: ☐ My vessel is clean, drained and dry and has not been in any infested waters within the last 30 days.

☐ My vessel has been thoroughly cleaned & completely dry for at least 30 days since last launched, or has been professionally decontaminated.

Vessel Registration Numbers: _____

Signature: _____ Date: _____

Thank You for helping to protect Don Pedro Lake!

Mussel-Infested Waters in the US

List last updated 12/5/2011 – Source USGS Website:
http://fl.biology.usgs.gov/Nonindigenous_Species/Zebra_mussel_distribution/Lakes_by_county/lakes_by_county.html

California

Anaheim Lake - Orange Co.
Irvine Lake - Orange Co.
Kraemer Basin - Orange Co.
Rattlesnake Reservoir - Orange Co.
Walnut Canyon Reservoir - Orange Co.
Lake Matthews - Riverside Co.
Lake Skinner - Riverside Co.
San Justo Reservoir - San Benito Co.
Cooper Basin Reservoir - San Bernadino Co.
Lake Havasu - San Bernadino Co.
Dixon Lake - San Diego Co.
El Capitan Reservoir - San Diego Co.
Lake Jennings - San Diego Co.
Lake Miramar - San Diego Co.
Lake Poway - San Diego Co.
Lake Ramona - San Diego Co.
Lower Otay Lake - San Diego Co.
Murray Reservoir - San Diego Co.
Olivenhain Reservoir - San Diego Co.
San Vicente Reservoir - San Diego Co.
Sweetwater Reservoir - San Diego Co.
Colorado River & Aqueduct

Arizona

Lake Havasu - Mohave Co.
Lake Mead - Mohave Co.
Lake Mohave - Mohave Co.
Topcock Marsh - Mohave Co.
Mittry Lake - Yuma Co
Colorado River
Salt River

Nevada

Lahontan Reservoir - Churchill/Lyon Co
Lake Mead - Clark Co.
Rye Patch Reservoir - Pershing Co.
Colorado River

Utah

Electric Lake - Emery Co.
Red Fleet Reservoir - Uintah Co.
Sand Hollow Reservoir - Washington Co.

Colorado

Grand Lake - Grand Co.
Lake Granby - Grand Co.
Shadow Mountain Reservoir - Grand Co.
Willow Creek Reservoir - Grand Co.
Jumbo Lake - Logan Co.
Tarryall Reservoir - Park Co.
Pueblo Reservoir - Pueblo Co.

New Mexico

Lake Sumner - De Baca Co.

Texas

Lake Texoma - Grayson Co.
Lake Ray Hubbard - Rockwall Co

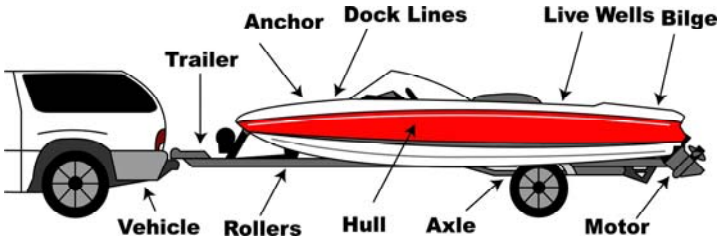
Infested River & Lake Systems

Colorado River
Mississippi River
Missouri River
Ohio River
The Great Lakes

Other States with Infested Waters

Alabama
Arkansas
Connecticut
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Nebraska
New York
North Dakota
Ohio
Oklahoma
Pennsylvania
Tennessee
Vermont
Virginia
West Virginia
Wisconsin

Trailered boats are the primary way that Quagga/Zebra mussels are introduced to unconnected water bodies.



Whenever you leave freshwater, take the following actions:

1. Inspect and clean vessel & trailer away from water body and launch ramp.
2. Inspect all exposed surfaces of vessel and trailer. Feel your boat's hull for any rough or gritty spots. Young microscopic mussels that have settled on your vessel will feel like sandpaper. If you find any mussels, alert the Department of Fish and Game at 866-440-9530.
3. Wash your vessel's hull, trailer, equipment, bilge, and any other exposed surfaces with high-pressure, 140° F hot water which will kill the mussels then dry the boat as much as possible.
4. Thoroughly clean and dry all fishing and recreational equipment.
5. Keep your vessel dry for at least five days in warm, dry weather or 30 days in cool, moist weather before launching into freshwater again.

For more information, visit: http://www.dfg.ca.gov/invasives/quaggamussel/
www.protectyourwaters.net http://www.100thmeridian.org

Thank you for your cooperation!
The Don Pedro Recreation Agency (209) 852-2396, www.donpedrolake.com

AQUATIC INVASIVE SPECIES MANAGEMENT PLAN

ATTACHMENT B

CDFW BOAT CLEANING AND AIS PREVENTION GUIDANCE

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PROTECT YOUR BOAT!
FIGHT QUAGGA AND ZEBRA MUSSELS

A GUIDE TO CLEANING BOATS

AND PREVENTING MUSSEL DAMAGE

DON'T MOVE A MUSSEL
2009

What is being done to contain the Quagga/Zebra?

State and federal agencies have joined forces to avert further infestations of Quagga/Zebra mussels and are urging boaters to help stop the spread of Quagga/Zebra mussels in California.

A multi-agency taskforce, including the California Departments of Fish and Game, Boating and Waterways, Water Resources, Parks and Recreation, and Food and Agriculture as well as the U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, National Park Services, and many local governments and water agencies, has launched a statewide outreach campaign to alert the public – and particularly boat owners – about the Quagga/Zebra mussel threat.

Boaters should be aware that laws now make it illegal to transport Quagga/Zebra mussels. Boats found with evidence of the mussels may be quarantined and boat owners may face fines in some states. Many local authorities have instituted mandatory inspection programs at their lakes and reservoirs. Contaminated or suspect boats are being turned away.

California Department of Fish and Game
1416 9th Street, 12th Floor
Sacramento, CA 95814
(866) 440-9530

www.dfg.ca.gov/invasives/quaggamussel

Thanks to Utah State Parks for their photographic contributions.

Protect Your Boat!
Keep Freshwaters Open to Boating and Fishing!

How can you help fight the Quagga/Zebra mussel invasion?

Boater and watercraft users can stop the mussels from spreading.

This guide was compiled specifically for boat owners and watercraft users. The information contains general guidelines for all boaters and a basic checklist for inspecting and cleaning boats and recreational equipment for Quagga/Zebra mussels. There are also additional inspection and cleaning checklists for specific types of boats and equipment. By taking the time to inspect and clean your boat, you can:

- Protect your boat, the aquatic environment, and the boating facilities you use (marinas, gas docks, piers).
- Keep waterways open for recreational boating and fishing.
- Prevent an economic disaster resulting in millions of dollars in damage to water transport facilities.
- Comply with state and federal laws regarding the spread of Quagga/Zebra mussels.

Quagga/Zebra mussels have invaded the West!

California's waterways currently face an enormous challenge: an invasion by Quagga mussels (*Dreissena rostriformis bugensis*) and Zebra mussels (*Dreissena polymorpha*). Zebra mussels, a native species of Eastern Europe, were first introduced in the United States through ballast water released into the Great Lakes in the late-1980s. Quagga mussels soon followed.

Great efforts were made to prevent the spread of these fresh water mollusks west of the 100th Meridian. In January 2007, Quagga mussels were discovered in Lake Mead and later in other reservoirs of the Lower Colorado River. Now they infest water bodies in Riverside, San Diego, Imperial and Orange counties. In January 2008, Zebra mussels were discovered in San Justo Reservoir in San Benito County. The spread of these mussels to additional California waters will seriously impact the state's aquatic environment and water delivery systems, endangering recreational boating and fishing.

What do they look like?

Quagga/Zebra mussels vary in color and often have dark and light stripes on their shells. They differ in size, from microscopic young to adults an inch or two in length. These invasive mussels cluster in huge colonies.

Zebra mussels next to dime.

Zebra mussels at San Justo Reservoir (right/below)

Photos San Benito County Water District

Various sizes of Quagga/Zebra mussels.

Quagga/Zebra mussels could severely reduce recreational boating and fishing activities if more waters become infested.

Quagga/Zebra mussels pose serious threats

Quagga/Zebra mussels may be tiny, but are highly destructive in freshwater systems because they can:

- Reproduce quickly and in very large numbers, up to 1 million larvae per spawning season.
- Colonize on both hard and soft surfaces, from the water's surface to more than 400 feet down, including boat hulls, propellers, anchors, docks, and boat trailers.
- Coat submerged surfaces such as piers, pilings, rocks, cables, boat ramps, docks, lines, pipes and fish screens, increasing maintenance costs.
- Infiltrate and damage boat engines, bilges, live wells, and steering components.
- Threaten the state's water treatment plants, hydroelectric plants, and reservoirs.
- Clog municipal water intake structures and obstruct the flow of drinking water.
- Cost taxpayers millions of dollars to repair damaged pipes and water transport facilities.
- Wreak havoc on the environment by disrupting the food chain by filtering the water column of phytoplankton and out-competing other species, including sport fish and endangered species.
- Change water conditions, causing heavier aquatic plant growth, oxygen loss, and fish kills.
- Result in infested waters being closed to boating and fishing altogether.

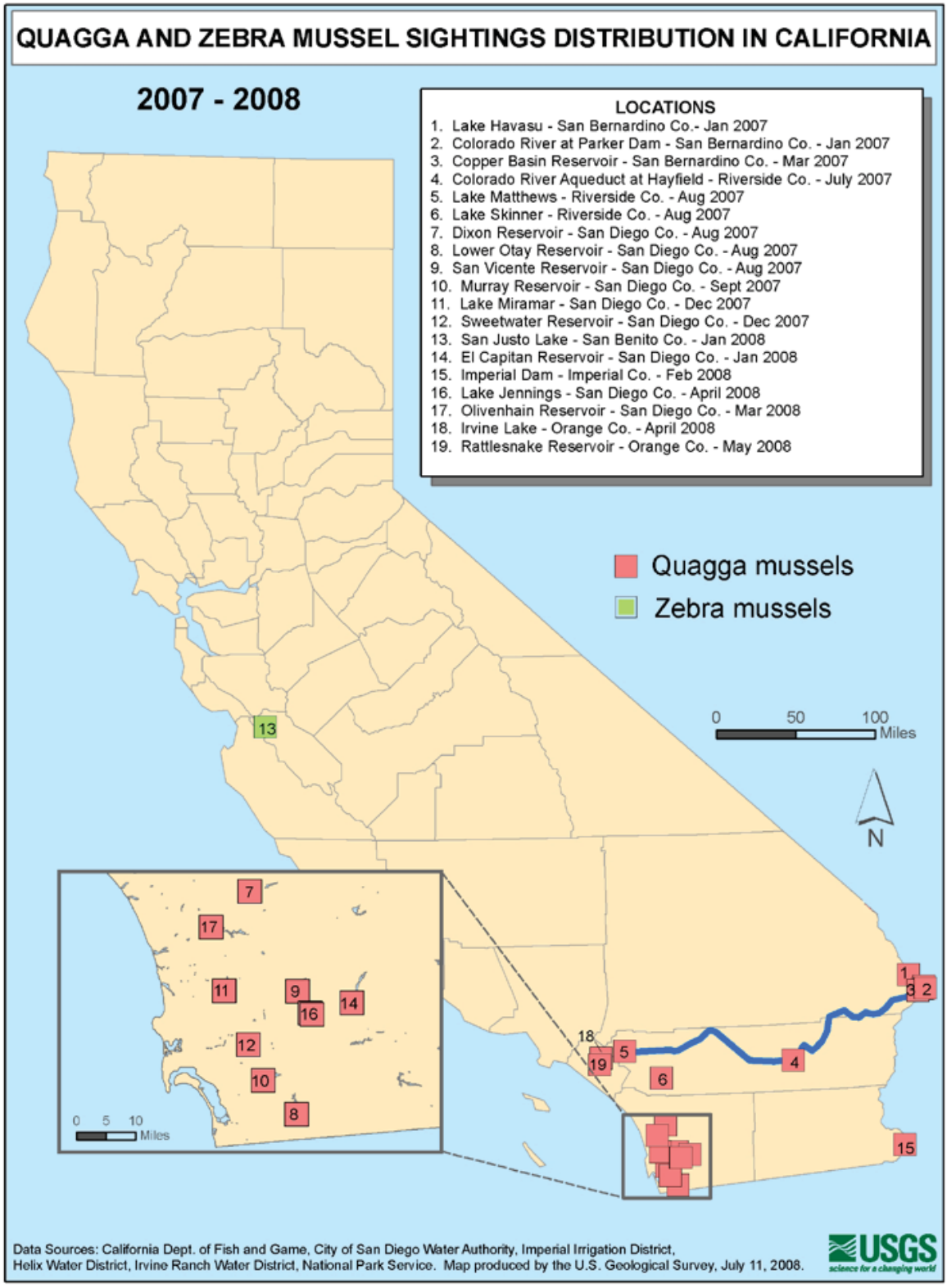
Once Quagga/Zebra mussels are established, in most cases it is impossible to eradicate them with current techologies.

How do Quagga/Zebra mussels ruin boats?

Quagga/Zebra mussels produce larvae (called veligers) too small to see with the naked eye. Newly settled young feel like sandpaper on smooth surfaces. As they quickly grow larger, Quagga/Zebra can be seen on boat hulls, especially around trim tabs and transducers along keels, and on trailers, anchors, and propellers. The mussels can also be found in or on boat bilges, ballast water, live wells, motors, fenders, life jackets, ropes – basically anything that comes into contact with infested water and can serve as a reservoir or "pocket" in which they can survive.

Quagga/Zebra mussels pose serious risks and costs to you as a boat owner because they can:

- Ruin your engine by blocking the cooling system and causing overheating.
- Increase drag on the bottom of your boat, reducing speed, and wasting fuel.
- Jam your boat's steering equipment.
- Require you to scrape and repaint your boat's hull.



The California Department of Fish and Game coordinates with the U.S. Geological Survey to generate a map of known locations of Quagga/Zebra mussels in the state. New locations are posted as soon as samples are positively identified. View the most current map:
http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel/maps/CaliforniaDreissenaMap.jpg

General Guidelines: All Boaters

It is important for all boaters to cooperate with vessel inspections conducted at California Department of Food and Agriculture Border Protection Stations and on waterways around the state. Remember, you do not want to transport any Quagga/Zebra mussels from an infested water body to another location currently free of Quagga/Zebra mussels. In addition, California law makes it illegal to transport these aquatic species, even if done so unintentionally.

Trailered boats are the primary way that Quagga/Zebra mussels are introduced to unconnected water bodies.

After boating in any freshwater system:

- Carefully inspect, clean, and drain your boat when you leave the water, using the checklists provided in this guide.
- All areas must be dry (including live wells) and clear of debris, and no standing water should be on board your boat in any manner (including bait cans or buckets).

Before traveling to any freshwater for boating:

- Inspect your boat for Quagga/Zebra mussels, which can survive five days out of water in California's hot summer and up to 30 days in cool, wet weather.
- If any residual water or mussels are discovered upon an inspection, clean your boat and all equipment using the same checklist procedures and let the vessel dry for five to 30 days, depending on the weather, before you enter the water.

Calculate your drying time at:
http://www.100thmeridian.org/Emersion.asp

Failure to clean your vessel can result in it being quarantined.

Quagga mussels on boat hull found at California Border Protection Station.

Photo California Dept. of Fish and Game

Basic Inspection and Cleaning Checklist: All Watercraft

Whenever you leave freshwater, take the following actions:

1. **Remove the boat from the water** and **away from the launch ramp** for vessel inspection and cleaning.
2. **Thoroughly inspect all exposed surfaces on your vessel and trailer**. If you find any mussels, scrape them off and kill them by crushing them. Dispose of the remains in the trash. Alert the Department of Fish and Game at 866-440-9530.
3. **Remove all plants and mud** from your boat, trailer, and all equipment. Dispose of all material in the trash.
4. **Carefully feel your boat's hull** for any rough or gritty spots, which may be young mussels that have settled on your vessel and cannot be seen. Microscopic Quagga/Zebra mussels will feel like sandpaper.
5. **Away from the waterway, wash your boat's hull**, trailer, equipment, bilge, and any other exposed surfaces with high-pressure, hot water. When possible use water at a temperature of 140° F (60° C) at the hull – or about 155° (68° C) at the nozzle – which will kill the mussels. Dry the boat as much as possible.
6. **Drain all water from your boat** (pull all plugs) and **dry all areas**, including the motor, motor cooling system, live wells, ballast tanks, bladders, bilges, and lower outboard units. Make sure that all life jackets, water skis or other items that have been in the water, including anchors, ropes, etc., are inspected, cleaned, and dried.
7. **Empty and dry all buckets** and **dispose of all bait** in trash receptacles before you leave. Do not take bait home, or leave it on the ground or dump it in any waterway.
8. **Thoroughly clean all fishing and recreational equipment** (fishing nets, etc).
9. **Clean and dry personal belongings, clothing, and footwear** that have come in contact with the water.
10. **Wash, dry, and brush pets** that have been in the water.
11. **Keep your watercraft dry for at least five days in warm, dry weather and up to 30 days in cool, moist weather** before launching into a freshwater.

Day boats or those that "come and go" and spend only a few hours in the water are still at risk for picking up and transporting mussels that may be attached to aquatic weeds. The basic cleaning steps apply to any and all watercraft.

Additional steps for specific boats follow.

Vessels that are slipped and moored at infested waters run greater risk of having settlers and adult mussels.

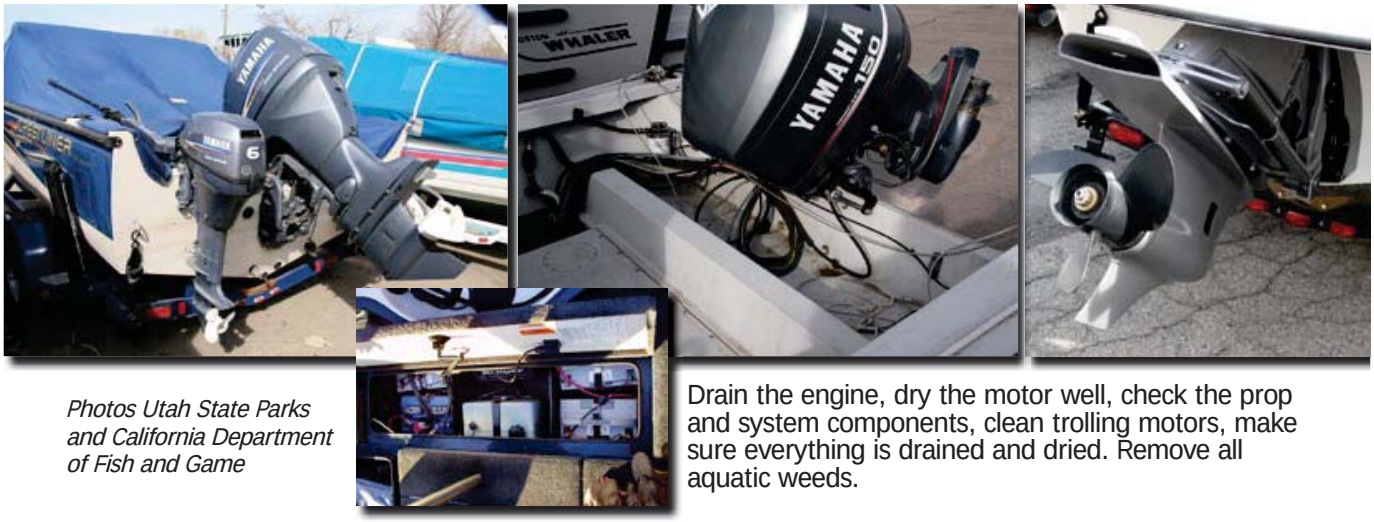
General Inspection and Cleaning

Boat Exterior: Entire hull, floor, transom wall, ballast tanks, ropes and lines, anchors, lights, pitot tube, depth sounders, trim tabs, cavitation plates, thru-hull fittings, depth transducers, water intakes and outlets

Motor: Entire exterior housing, propeller, propeller shaft, propeller shaft support, propeller guards, propulsion units, lower unit, gimbal area, water intakes and outlets

Boat Equipment and Contents: All fishing nets and other fishing equipment, lines and ropes, float belts, life jackets, float cushions, water skis and tow ropes, ski gloves, equipment lockers, waterfowl decoys and camouflage blinds, clothing and footwear, floats, fenders, dock guards inner tubes and other inflatable items, downriggers and other fishing equipment, bait containers/buckets and live wells, trolling motors, and internal ballast tanks

Trailer: Trailer frame, axles, license plate and holders, lights and wiring, fenders, hangers, trailer tires and wheels, rollers and bunks, wiring, springs, pockets and hollow spaces



Photos Utah State Parks and California Department of Fish and Game

Drain the engine, dry the motor well, check the prop and system components, clean trolling motors, make sure everything is drained and dried. Remove all aquatic weeds.

Be sure to check the trailer for aquatic weeds and other areas on the boat like bow lights.

All vessels should be cleaned, drained, and dried!

Photos Utah State Parks

Check all areas listed under general inspection and cleaning. Feel the hull and check the trim tabs to ensure no standing water (veligers) or adults have taken hold. Check for weeds and other material as well.

Vessels should be thoroughly cleaned. Those contaminated with mussels should be scraped, washed, drained and dried. Dry time may be between five days in hot, dry California summers and up to 30 days in cool moist weather.

Photos California Department of Fish and Game

Check, clean, drain and dry live wells, all drains, and any other area where water might collect.

Remember: Most storm drains flow directly into rivers and other waters. Do not wash your vessel or drain it near a storm drain.

To prevent illegal discharge of oil when draining or flushing the bilge, use oil absorbents where possible. Oil absorbents should be disposed of as hazardous waste in California. Call 800-253-2687 for drop off locations.

Water Ski Boats

1. **After completing the basic checklist, drain water** from every internal ballast tank system as much as possible.

2. **Resume normal ballast system operation** when you go boating again. Be sure to winterize the vessel when boating season ends.

Southern California Marine Association

Ski boat covers open.

California Department of Fish and Game

Ski boat ballast water lines.

Ballast system water pump, water lines, and caps should all be flushed and cleaned.

Trim tabs on transom.

Follow these actions to stop mussels from growing inside the entire system. Failure to do so could result in restriction of water lines, overheating and pump damage, as well as the increased likelihood of needing to replace expensive system components.

Houseboats, Pontoon Boats, and Other Large Vessels

1. **After completing the basic checklist**, **completely drain and dry all water systems that use lake water** including air conditioning, personal sanitation, and washdown systems. Note: Vessel sewage must be disposed of at a pump-out facility or dump station. The longer the boat has been in the water, the higher the chance these systems have been contaminated.

2. **Take special care to protect system components** including water supply and discharge lines, filter screens, pumps, valves, and associated parts. Small passages in the air conditioning radiator core are highly susceptible to being plugged by mussels.

Southern California Marine Association

All areas that can hold water should be drained and dried. Pontoons should be inspected for mussels, settlers, and aquatic weeds that may have mussels attached.

Photos Utah State Parks

Vessels should be thoroughly cleaned. Those contaminated with mussels should be washed, scraped, drained and dried. Dry time may be between five days in hot, dry California summers and up to 30 days in cool moist weather.

Vessels that are slipped and moored at infested waters run greater risk of having settlers and adult mussels.

Hulls should be inspected; all motors, intakes and any equipment that comes into contact with the water should be flushed, washed, drained and dried whether the equipment is attached to the boat (like a slide) or unattached like skis or floatation devices.

Since large vessel water systems are located deep within the hull, they require extra effort to access, clean, and dry to protect them. Failure to properly clean could result in costly replacement of system components if infestation occurs.

Large Vessels continued *Sailboats (over)*

Sailboats

1. **After completing the basic checklist**, **completely drain and dry all water systems that use lake water**, including your air conditioning, personal sanitation, and washdown systems. Note: Vessel sewage must be disposed of at a pump-out facility or dump station. The longer your boat has been in the water, the more likely the chance these systems have been contaminated.

2. **Take special care to protect system components** including water supply and discharge lines, filter screens, pumps, valves, and associated parts. Small passages in the air conditioning radiator core are highly susceptible to being plugged by mussels.

3. **Give special attention to the centerboard trunk**, including the rudder and transom, keel and fittings, which is a major concern.

4. **Of special concern on sailboats is the removal of aquatic weeds.** Remove all vegetation from the vessel.

Vessels that are slipped and moored at infested waters run greater risk of having settlers and adult mussels. Boaters should check their vessels for mussels and vegetation that could carry mussels. Some vegetation is an invasive species as well, like water hyacinth.

California Department of Fish and Game

High Performance Speed Boats

1. **After completing the basic checklist, make sure that you flush your 'external' cooling system.** Flushing your system when retrieving your boat with fresh water supplied by the marina or boat ramp you use may help eliminate the Quagga/Zebra Mussel invasion.

2. **If your boat is not currently equipped with a 'flush kit' visit your local marine service center for details.** It is important for boat owners to recognize that the 'external' system for cooling is the problem area and although many engine suppliers equip new boats with a 'flush system', not all do. Having a 'flush kit' installed correctly (typically by a marine engine service center) would address the problem. Many older boats likely do not have a 'flush kit', but could have one installed.

Closed cooling system.

Photo Mercury Marine

Photos Southern California Marine Association

Personal Watercraft

1. **Avoid running craft through aquatic plants** because this may damage the craft, plug water intakes, and increase mussel contamination.

2. **Stop the engine** when water activities cease**.**

3. **Push or winch craft** onto the trailer, without running the engine.

4. **Remove the craft from the water** and **away from the launch ramp** for vessel inspection and cleaning.

5. **After completing the basic checklist**, **inspect and clean** all of the systems and components that apply specifically to the craft.

6. **Start and run the engine** for five to 10 seconds to blow out water and contaminants from the underbody jet drive system.

7. **Stop the engine** and **remove all plants, mud, and other contaminants** from the steering nozzle and the rest of the hull.

8. **Check underneath the craft for Quagga/Zebra mussels**, especially the water intake area (including the edges of the intake grate).

9. **Dry any pockets** that may be wet or holding water.

10. **Drain any ballasts** on the craft, **rinse with hot water,** and **allow to dry**.

Photos Utah State Parks

Personal watercraft should be drained of all water, washed, and dried.

The steering nozzle should be inspected for aquatic weeds that might have mussels.

Kayaks, Canoes, and Inflatable Rafts

1. **After completing the basic checklist, inspect and clean** any components that apply specifically to the craft.

2. **Allow the craft to dry thoroughly** before using it in any other water body.

3. **Take special care to dry inflatables** before rolling them up.

Photo California State Parks

Photo Utah State Parks

Kayaks, canoes and all inflatables need to be cleaned, drained, and dried.

Any equipment that goes into the water needs to be inspected and cleaned.

Photo California Department of Fish and Game

Dive Gear

1. **Check all gear that could potentially hide any water (veligers)** (include regulators, buoyancy compensation device, wetsuits, masks, gloves, boots, snorkels, and any other dive gear).

2. **Thoroughly clean all regulators, BCDs, wetsuits, masks, snorkels, and any other dive gear,** making sure to clean both the inside and outside of the BCD to ensure that no mud or organic matter is present – use a brush to scrub if necessary.

3. **After cleaning, rinse your suit, equipment and inside of BCD with hot (<40° C or 104°F) or salt water (1/2 cup salt/gallon)**. Note, if you use the salt-water solution, it is very important to thoroughly rinse the equipment in freshwater after your cleaning because the salt crystals can harm your equipment. Divers can also use potassium at 100mg/liter at a temperature of >30° C, or using commercially available dive equipment cleaning compound that contains ammonia, vinegar, or chlorine. Dispose of cleaning solution properly.

4. **Allow gear, suit, and other equipment to dry** before diving in different waters. Veligers can survive on a wetsuit if left damp.

5. **If feasible, consider freezing** your equipment overnight to kill any veligers.

Remember: Most storm drains flow directly into rivers and other waters. Do not wash your vessel, equipment or gear or drain it near a storm drain. Stop the spread of mussels!

Additional Resources

For more information:

- General information on Quagga/Zebra mussels:
  http://www.dfg.ca.gov/invasives/quaggamussel/
- Boat cleaning tips: http://100thmeridian.org/
- General invasive species information:
  http://www.fws.gov/contaminants/Issues/InvasiveSpecies.cfm

You may also contact the following state departments for additional information or assistance:

- Department of Fish and Game: 866-440-9530
- Department of Boating and Waterways: 888-326-2822
- Department of Water Resources: 916-653-9712
- Department of Parks and Recreation: 916-654-7538

If you discover mussels in a new location, report it to the Quagga/Zebra hotline 866-440-9530

California Codes that Apply to Quagga/Zebra Mussels

- Fish and Game Code § 2301
  - Specific to Dreissenid Mussels
  - Includes both adults and water that may contain them
- Title 14 CCR § 671 (F&G Code § 2118)
  - Places restrictions on Importation, Possession and Transportation of Live Animals
- Title 14 CCR §230 (f) and (h)
  - Special conditions on tournaments to provide for welfare of fish

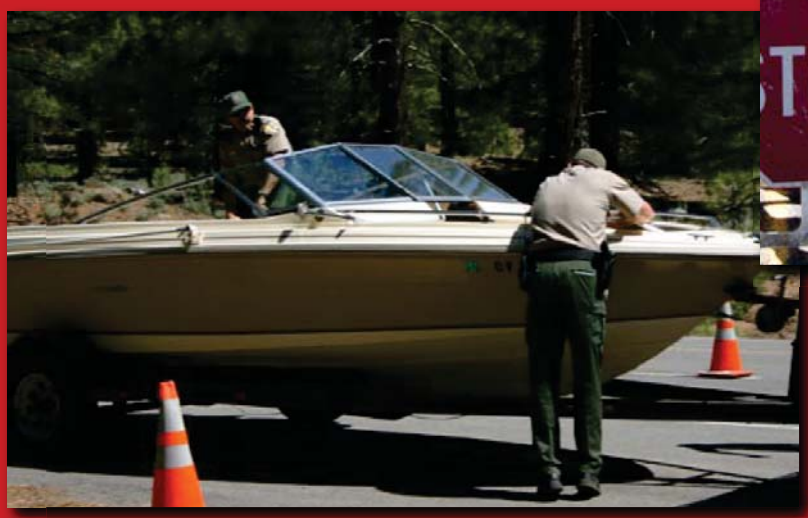
The law gives the California Department of Fish and Game the authority to:

- Stop and inspect conveyances
  - vehicles
  - boats and other watercraft
  - containers
  - trailers
- Order conveyances that contain water be drained, dried, or decontaminated
- Impound or quarantine conveyances
- Revoke or deny permits for failure to comply

DON'T MOVE A MUSSEL

Enjoy the water and the fishing!

Support checkpoints!



STOP AQUATIC HITCHIKERS!

Prevent the transport of nuisance species.
Clean all recreational equipment.

www.ProtectYourWaters.net

Help keep our waters clean!