

PREVENTING THE SPREAD OF AQUATIC INVASIVE SPECIES – Best Management Practices for Boaters

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SALTWATER – Best Management Practices (BMPs) FOR BOATERS

- Follow the recommendations provided by the University of California Cooperative Extension - Sea Grant Extension Program (UCSEP) found in the bilingual fact sheet entitled: “Stop Aquatic Invaders on Our Coast! / ¡Detenga el Transporte de Especies Invasoras Acuáticas en Nuestras Costas!” To order copies visit: <http://seagrant.ucdavis.edu/publications.htm#posterfactsheet>
- In addition to the recommendations included in the fact sheet mentioned above, the UCSEP has developed other recommendations to prevent and control the spread of AIS for both boats that travel over and under 100 miles:
 - Boats that do not travel long distances are less likely to pick up invasive species that are new to the home harbor. About one-half of all boaters in California’s coastal counties take no trips over 100 miles from home. (CA Dept Boating and Waterways 2002) Because they are large in number and spend much time in the home marina, they likely contribute more to elevated copper levels than more active boats. Thus, the most reduction in pollution with a low risk of Aquatic Invasive Species (AIS) transport could likely be achieved if such boats used nontoxic hull coatings with companion strategies, such as slip liners or frequent, in-water hull cleaning.
 - Boats that travel long distances are more likely to acquire and transport invasive species that are new to the home harbor. From 2% to 7% of boats in California’s coastal counties make frequent trips over 100 miles from home. (Cal Boating, 2002). These boats may be better candidates for copper-based or less-toxic antifoulants, as opposed to nontoxic hull coatings. Because they are relatively few in number and spend more time at sea, they would discharge relatively less toxicant to confined, marina waters.

For more information about how to prevent the spread of Aquatic Invasive species in saltwater and to order publications developed by the University of California Cooperative Extension - Sea Grant Extension Program visit: <http://seagrant.ucdavis.edu/>

FRESHWATER – BMPs FOR BOATERS

New Zealand Mudsnaill (*Potamopyrgus antipodarum*)

The New Zealand mudsnail is a very small aquatic snail native to freshwaters of New Zealand. They were first discovered in North America in the late 1980's and in California in 2000 in the Owens River. These snails range in size from a grain of sand to 1/8 inch in length and are black or brown in color. Their rapid reproduction can lead to densities of 500,000 per squared meter 1 million per square yard. A single snail could result in the production of 40 million snails in one year.

Impacts could be significant if nothing is done to control its spread. They outcompete and replace native invertebrates. They can also reduce whole-stream algal production and cause drastic and harmful impacts in native plant and animal food web of streams and lakes. The mudsnail is not a good food source for trout. The snails have the ability to pass through trout intestine undigested and the snails contain very little food energy. New Zealand mudsnail can significantly impact trout fisheries, including federally threatened and endangered species.

There are occurrences of New Zealand mudsnail scattered throughout California. These animals spread very easily. To see a map of infestations in California, go to <http://www.dfg.ca.gov/invasives/mudsnaill/> and click on "Map of CA Infested Areas."

It is believed they are spread into new river systems primarily by humans. Recreationists such as anglers, boaters and others transporting contaminated gear can easily move mudsnails to new locations. Biological consultants and researchers are others who frequent rivers and streams and, therefore, should clean their gear carefully. It is also possible that wildlife could spread this invader.

Unfortunately, the New Zealand mudsnail can't be eradicated. Prevent the spread of New Zealand Mudsnails by implementing the following measures:

- If you wade, freeze waders and other gear overnight (at least 6 hours).
- Have extra waders and boots that are used only in infested waters. Store them separately.
- After leaving the water, inspect waders, boots, float tubes, boats/trailers—any gear used in the water.
- Remove visible snails with a stiff brush and follow with rinsing. If possible, freeze or completely dry out any wet gear and contact the Department of Fish and Game at 866-440-9530 or invasives@dfg.ca.gov
- Never transport live fish or other aquatic animals or plants from one water to another.
- If you think you have found a New Zealand mudsnail, send an e-mail reporting the location with your contact information to the Department of Fish & Game Invasives Species group: invasives@dfg.ca.gov

For more information about the New Zealand mudsnail check:

http://www.anstaskforce.gov/Documents/NZMS_MgmtControl_Final.pdf

QUAGGA AND ZEBRA MUSSELS

Dreissena bugensis (Quagga) and *Dreissena polymorpha* (Zebra) are destructive invasive aquatic species native to the Ukraine and Russia. These mussels 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.

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.

Quagga mussels have been detected in the Colorado River system. Any facility, reservoir, lake or stream receiving raw Colorado River water has been exposed to the Quagga mussel. Quagga mussels are currently found in waters from the Nevada border to San Diego County. Zebra mussels were found in San Justo Reservoir, San Benito County, in January 2008. They are currently the only known population of Zebra mussels in the state. For the most up-to-date listing of confirmed mussel finds, go to:

<http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel/maps/CaliforniaDreissenaMap.jpg>

To prevent dreissenid mussels spread to uninfested waters, the single, most useful practice is to carefully inspect, clean, drain, and dry your boat and equipment when you leave the water. Useful checklists are provided in the [Boat cleaning guide book](#) found at <http://www.dfg.ca.gov/invasives/quaggamussel/> (Click on Boat cleaning guide book (PDF)).

- Vessels slipped and moored in infested waters run the greatest risk of becoming infested with adult mussels.
- Day boats, or watercraft that “come and go”, and spend only a few hours in water, still pose considerable risk for transporting larval mussels and mussels attached to aquatic weeds. The basic cleaning steps apply to all watercraft.
- Generally, the following precautionary steps are useful in handling other AIS in both fresh and salt water environments.

AFTER BOATING IN ANY FRESHWATER SYSTEM:

INSPECT AND CLEAN

- Remove the boat from the water and away from the launch ramp for vessel inspection and cleaning.
- Remove all debris, plants and mud from your boat, trailer, and all equipment. Dispose of all this material in the trash.
- 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.
- Thoroughly inspect all exposed surfaces on your vessel and trailer. If you find any mussels, scrape them off and immediately contact your local Department of Fish and Game office (contacts are listed at the bottom of this document).
- Encourage your marina operator to hold a mussel sample so it can be mailed to a regional Fish and Game office for mussel identification. Specific Fish and Game offices information contacts are listed at the bottom of this document.
- Away from the waterway and storm water drains, wash your boat’s hull, trailer, equipment, internal systems, the bilge area, and any other exposed surfaces with high-pressure, hot water (140° F (60° C) at the hull – or about 155° (68° C) at the nozzle) for a minimum of 10 seconds to kill the mussels.

DRAIN

- Away from the waterway, drain all water from all areas that can hold water, including your boat (pull all plugs), the motor and its cooling system, livewell, transom and bilge wells, ballast tanks and bladders, and lower outboard units. Inspect life jackets, water skis, and all other equipment that has been in the water, including anchors, ropes, etc., and ensure that they’re clean and dry. To prevent illegal discharge of oil when draining or flushing the bilge, use oil absorbents. Dispose of used oil absorbents as hazardous wastes. Call 1-800-CLEANUP (253-2687) or visit www.earth911.org for drop off locations.

DRY

- Allow all areas to dry.
- Empty and dry all buckets and dispose of all bait in trash receptacles before you leave. Do not take bait home, leave on the ground, or dump it in a waterway.
- Keep your watercraft, motors, trailers, and equipment thoroughly dry for at least five days in warm, dry weather and up to 30 days in cool, moist weather, before launching into a freshwater. An estimated dry time can be calculated at <http://www.100thmeridian.org/Emersion.asp>
- Consult the [Boat Cleaning Guide Book](#) (reference above) for additional steps for specific boats.

BEFORE TRAVELING TO ANY FRESHWATER SYSTEM FOR BOATING:

- In addition to being sure to clean, drain and dry watercraft, the Department of Boating and Waterways urges boaters to plan for possible launch restrictions and inspections by calling water bodies before leaving home (<http://www.dbw.ca.gov/BoaterInfo/QuaggaLoc.aspx>). Programs and requirements vary and are subject to change.
- Inspect your boat for Quagga/Zebra mussels, which can survive five days out of the water in California's hot summer and up to 30 days in cool, wet weather.
- If any residual water or mussels are found upon inspection, clean your boat and all equipment using the [Boat Cleaning Guide Book](#) checklist (reference above) and let the vessel dry for five to 30 days, depending on the weather, before you enter the water. Recheck your drying time by checking <http://www.100thmeridian.org/Emersion.asp>

Note: Quagga and zebra mussels are found only in fresh water. If a boat is only used in saltwater it is at little to no risk of exposure to freshwater mussels, though it may be exposed to other invasive species such as false dark mussels (*Mytilopsis leucophaeata*).

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

- Stop and inspect conveyances before ingress to and after egress from any California water body. A conveyance is defined as any water-exposed part of watercraft and associated boat equipment, including vehicles, trailers, motors or engines, bilges, pontoons ballast bladders, containers, fishing gear, live wells, bait containers, etc.;
- Order conveyances that contain water to be decontaminated, drained, and dried;
- Impound or quarantine conveyances until non-viability of mussels is certain; and
- Revoke or deny permits for failure to comply.

For More information contact the Department of Fish and Game at 866-440-9530 or visit <http://www.dfg.ca.gov/invasives/quaggamussel/>