

**EXCERPT FROM AN EMAP BASED QUALITY ASSURANCE PROJECT PLAN
DEVELOPED BY THE CALIFORNIA DEPARTMENT OF FISH AND GAME AQUATIC
BIOASSESSMENT LABORATORY (2008)**

3.2.3 Equipment Cleanup and Check

All equipment and gear used at a stream site must be cleaned and disinfected between sites to reduce the risk of transferring nuisance species and pathogens. Organisms of primary concern in the U.S. include Eurasian watermilfoil (*Myriophyllum spicatum*), New Zealand mud snails (*Potamopyrgus antipodarum*), zebra mussels (*Dreissena polymorpha*), *Myxobolus cerebralis* (the sporozoan parasite that causes salmonid whirling disease), and *Batrachochytrium dendrobatidis* (a chytrid fungus that threatens amphibian populations). Field crews must be aware of regional species of concern, and take appropriate precautions to avoid *National Rivers and Streams Assessment Revision No. 1 Field Operations Manual Date: 18 January 2008* transfer of these species. There are several online sources of information regarding invasive species, including information on cleaning and disinfecting gear, such as the Whirling Disease Foundation (www.whirling-disease.org), the USDA Forest Service (*Preventing Accidental Introductions of Freshwater Invasive Species*, available from http://www.fs.fed.us/invasivespecies/documents/Aquatic_is_prevention.pdf), and the California Department of Fish and Game (Hosea and Finlayson 2005). General information about freshwater invasive species is available from the U.S. Geological Survey Nonindigenous Aquatic Species website (<http://nas.er.usgs.gov>), the *Protect Your Waters* website (<http://www.protectyourwaters.net/hitchhikers>) that is co-sponsored by the U.S. Fish and Wildlife Service, and the Sea Grant Program (<http://www.sgnis.org>).

Note that many organizations now recommend **against** using felt-soled wading boots in affected areas due to the difficulty in removing myxospores and mudsnails. Handle and dispose of disinfectant solutions properly, and take care to avoid damage to lawns or other property.

Table 3-2 describes postsampling equipment care. Inspect all equipment, including nets, boat, and trailer, and clean off any plant and animal material. Prior to leaving a site, drain all bilge water and live wells in the boat. Inspect, clean, and handpick plant and animal remains from vehicle, boat, motor, and trailer. Before moving to the next site, if a commercial car wash facility is available, wash vehicle, boat, and trailer and thoroughly clean (hot water pressurized rinse--no soap). Rinse equipment and boat with 1% bleach solution to prevent the spread of exotics.

Table 3-2. Postsampling equipment care.

1. Clean for biological contaminants.
 - Prior to departing site, drain all water from live wells and buckets used to hold and process fish, and drain all bilge water from the boat.
 - Inspect motor, boat, trailer, sampling gear, waders, boots, etc. for evidence of mud, snails, plant fragments, algae, animal remains, or debris, and remove using brushes or other tools.
 - At the base location, inspect and rinse seines, dip nets, kick nets, waders, and boots with water and dry. Use one of the procedures below to disinfect gear if necessary.

Additional precautions to prevent transfer of Whirling Disease spores, New Zealand mudsnails, and amphibian chytrid fungus.^a

- Before visiting the site, consult the site dossier and determine if it is in an area where whirling disease, New Zealand mud snails, or chytrid fungus are known to exist. Contact the local State fishery biologist to confirm the existence or absence of these organisms.

- If the stream is listed as “positive” for any of the organisms, or no information is available, *avoid using felt-soled wading boots*, and, after sampling, disinfect **all** fish and benthos sampling gear and other equipment that came into contact with water or sediments (i.e., waders, boots, etc.) by one of the following procedures:

Option A:

1. Soak gear in a 10% household bleach solution for at least 10 minutes, **or** wipe or spray on a 50% household bleach solution and let stand for 5 minutes
2. Rinse with clean water (**do not** use stream water), and remove remaining debris
3. Place gear in a freezer overnight **or** soak in a 50% solution of Formula 409[®] antibacterial cleaner for at least 10 minutes **or** soak gear in 120°F (49°C) water for at least 1 minute.
4. Dry gear in direct sunlight (at least 84 °F) for at least 4 hours.

Option B:

1. Soak gear in a solution of Sparquat[®] (4-6 oz. per gallon of water) for at least 10 minutes (Sparquat is especially effective at inactivating whirling disease spores).
2. Place gear in a freezer overnight **or** soak in 120°F (49°C) water for at least 1 min.
3. Dry gear in direct sunlight (at least 84 °F) for at least 4 hours.

2. Clean and dry other equipment prior to storage.

- Rinse coolers with water to clean off any dirt or debris on the outside and inside.
- Rinse periphyton sampling equipment with tap water at the base location.
- Rinse coolers with water to clean off any dirt or debris on the outside and inside.
- Make sure conductivity meter probes are rinsed with deionized water and stored moist.
- Rinse all beakers used to collect water chemistry samples three times with deionized water. Place beakers in a 1-gallon sealable plastic bag with a cubitainer for use at the next stream.
- Check nets for holes and repair or locate replacements.

3. Inventory equipment and supply needs and relay orders to the Field Logistics Coordinator.

4. Remove GPS, multi-probe meter, and electrofishing unit from carrying cases and set up for predeparture checks and calibration. Examine the oxygen membranes for cracks, wrinkles, or bubbles. Replace if necessary, allowing sufficient time for equilibration.

5. Recharge/replace batteries as necessary.

6. Replenish fuel and oil; if a commercial car wash facility is available, thoroughly clean vehicle and boat (hot water pressurized rinse --no soap).