

Guidelines for Prevention of Introduction and Spread of Aquatic Threats by Cleaning and
Disinfecting Fishing and Field Equipment
Last Revised August 13, 2009
(modified from Rocky Mtn NP and National Wildlife Health Center Standards)

Great Smoky Mountains National Park has known occurrences of the following aquatic diseases: *Batrachochytrium dendrobatidis* (Bd), a chytrid fungus, and ranavirus. Other invasive exotic species, such as the New Zealand Mudsnail and the diatom called “Dydimosira”, are outside the park but could easily be brought into park streams. Humans unwittingly assist the spread of these organisms by transferring them from one body of water to another on footwear, waders, nets, and other equipment. Help protect Smoky Mountain aquatic species by following the recommended prevention and disinfection procedures below. It is expected that park staff, cooperators and researchers working on approved projects will follow the guidelines below. Recreationalists (including park staff on their lieu days) are strongly encouraged to follow these guidelines.

Guidelines

1. Dedicate specific equipment to each separate site (stream or pond) (**optional**). This may be possible for researchers who only work at one site in the park. If equipment is specific to a site and has not been used elsewhere guidelines under number 4 do not need to be followed. If equipment will be used at only one site this year but have previously been used in other areas, follow the guidelines under number 4 to disinfect equipment prior to beginning work this season. Note: if a sampling site has a wider geographic reach follow the recommendations under number 4.
2. Do not use felt wading soles (**highly recommended**).
3. When conducting surveys within a drainage start at the top of the drainage and work downstream (**highly recommended**). Aquatic threats are typically located in lower elevation areas and this will minimize the risk of spreading organisms upstream.
4. **Prior** to working in park waters clean and disinfect any equipment that has been in contact with soil and water (**required**). Examples include boots, waders, nets, etc. Equipment **also** needs to be cleaned and disinfected in the following situations; a) after a visit to any area where aquatic diseases are known to exist. It is **recommended** that equipment be cleaned under the following situations: b) when moving within a drainage to sites that are >4 kilometers (2.5 miles) apart; and c) before visiting different drainages.

There are several steps and options to disinfect equipment. For either option each step is **required** to insure proper disinfection against all pathogens.

Disinfection options:

- a. **Required:** 1) Remove mud, snails, algae and other debris from nets, boots, waders and other equipment utilizing brushes, screwdrivers, or other tools, **and** 2) Wash all equipment and tools used to clean equipment with bleach solution. Soak equipment for 10 minutes in the 10% household bleach solution (5,000 ppm hypochlorite) **or** when sensitive equipment cannot be soaked disinfect equipment with a $\geq 50\%$ contact bleach solution; **and** 3) Freeze gear overnight **or** soak and/or agitate equipment for >10 minutes in 50% solutions of Formula 409 Antibacterial Version (household cleaner) **or** soak equipment for >one minute in >120°F water (dishwasher cycles will provide adequate heat). NOTE: Freezing gear overnight or longer is most effective.

- b. **Required:** 1) Remove mud, snails, algae and other debris from nets, boots, waders and other equipment utilizing brushes, screwdrivers, or other tools; **and** 2) Soak and or agitate gear and equipment in a solution of 4-6 oz. Sparquat per gallon for >10 minutes exposure. Sparquat is a quaternary ammonium disinfectant (benzalkonium chloride) that is also effective at inactivating whirling disease spores, **and (recommended)** 3) Freeze gear overnight **or** soak equipment for >one minute in >120°F water (dishwasher cycles will provide adequate heat). NOTE: Freezing gear overnight or longer is most effective.

- c. **Recommended:** Allow equipment to air dry, preferably in direct sunlight >84°F for >four hours.

NOTE: Don't dump the waste bleach in the field. The chlorine will volatilize within a few hours if you leave the bucket uncovered. Don't dump the bleach in or near water under any circumstances.

If you believe that you are working with equipment that cannot sustain the rigors of some of these treatments, contact Great Smoky Mountains National Park Resource Management and Science for alternative recommendations.