

Manual of Fisheries Survey Methods II: with periodic updates

Chapter 24: Aquatic Nuisance Species Control Policy for Fisheries Division Field Surveys

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This document was derived from recommendations in various Sea Grant publications, research presented at the International Zebra Mussel and Other Aquatic Nuisance Species Conference in 1996, and the 1998 Coolwater Culture Workshop. Although these guidelines were written specifically for zebra mussels, following these guidelines will also reduce the spread of several other aquatic nuisance species such as Eurasian water milfoil, curlyleaf pondweed, purple loosestrife, and spiny water flea. It will be revised as new information becomes available.

Below are guidelines for disinfecting various types of equipment used in lakes and ponds contaminated with zebra mussels, guidelines for operating rearing ponds, and recommendations for disinfecting water used to transport fish. Keep in mind that:

- The primary factors limiting survival of zebra mussels are moisture and temperature. The maximum out-of-water survival time of zebra mussels in ideal conditions is about 10 days for adults and 3 days for newly settled juveniles. In most situations, we will be dealing with either juveniles or veligers in and on our equipment.
- The need for disinfecting can be reduced by scheduling surveys of non-infested waters before surveys of zebra mussel infested waters.

24.1 Small equipment such as scap nets, measure boards, buckets, rain gear, waders, anchors

- Dry completely and keep dry for 3 days.
- If the equipment is needed prior to 3 days, soak in a solution of 1 part chlorine bleach to 10 parts water (example: 1 gallon of bleach to 10 gallons of water) for a minimum of 30 minutes. Alternatives include thorough rinsing with hot water (> 110F) or freezing (< 0F) for a minimum of 24 hours.

24.2 Large equipment such as trap nets, gill nets, fyke nets, and holding crates

- Inspect all nets carefully. The degree of infestation will depend on how long the nets have been in the water. Look carefully for signs of adult zebra mussels attached to the netting, particularly if the nets have been in the water more than 1 night.
- Stretch nets outdoors until dry, then pack and bring inside to sit for 3 additional days if no mussels were found, 10 days if mussels were found. Bringing equipment inside is recommended because of the potential for rain or dew to keep mussels alive.
- Label each net with the ending day of the quarantine to avoid any confusion as to availability for use.
- If the nets are needed prior to the end of the quarantine period, fill a horse tank with a solution of 1 part chlorine bleach to 10 parts water and soak each net for a minimum of 30 minutes.

24.3 Boats and trailers

- Remove any vegetation clinging to boat, prop, trailer, and other equipment while still at the access site. Zebra mussels readily attach to aquatic vegetation, and Eurasian water milfoil and other exotics can also be transferred that way.
- After returning to the work station, thoroughly rinse the boat inside and out with tap water.
- Rinse off trailer, outboard, and even the truck if it was backed into the water.
- Flush the outboard to remove all lake water from inside the motor. Make sure all vegetation and debris are removed.
- Live wells on shocker boats should be given the chlorine bleach treatment described above. Make sure the intakes and outlets of the live wells are also treated. Chlorine should only be used when it can be completely rinsed away prior to going to another water body. Do not apply chlorine at a launch site.
- After rinsing and flushing, let the boat sit for 3 days in a dry location. If the boat was docked at the lake, the drying time should be increased to 10 days.
- If the boat is needed right away, rinse the boat as mentioned above, only with hot water instead of tap water. It requires a temperature of 110F to kill veligers and 140F to kill adults. Flush the outboard with hot water.
- A quick, easy method for flushing outboards is to use muffs, which can be purchased at any marine store. Hook it up to either a cold or hot water tap—depending on length of time before the outboard may be used again.

24.4 Rearing ponds

24.4.1 *Uncontaminated ponds:*

- To prevent contamination by boat, designate one boat for work (fertilizing, netting, etc.) in uncontaminated ponds.
- When harvesting fish, draw transport water from the rearing pond, not another water body.
- After stocking fish into infected water, disinfect any equipment that came in contact with the water.

24.4.2 *Contaminated ponds:*

- Whenever possible, stock fish from contaminated ponds into contaminated waters. Otherwise, use the transport disinfect recipes below.
- Research has shown that rotenone will kill all ages of zebra mussels at concentrations less than those normally used to treat our ponds. Therefore, if the source of contamination to a pond can be eliminated, the pond can be disinfected by the fall rotenone treatment.

24.5 Fish transport units

The chemical solutions below will kill zebra mussel veligers in water used to transport live fish. These recommendations were made by David A. Culver at the 1998 Coolwater Culture Workshop on January 26, 1998.

1. For brood and other adult fish, and trout and muskellunge greater than 150 mm in length:
 - Treat with 100 mg of 40% formalin per liter of rearing water for minimum of 2 hours.
 - 100 mg of 40% formalin/L = 378.5 mg/gal. = **37.85 g/100 gal.**

2. For hybrid striped bass (only):
 - Treat with 20,000 mg NaCl per liter for minimum of 2 hours during transport.
 - $20,000 \text{ mg NaCl/L} = 2\% = \mathbf{7.57 \text{ kg/100 gal.}} = 16.7 \text{ lb./100 gal.}$
3. For fingerlings walleye, saugeye, largemouth bass, hybrid striped bass and channel catfish:
 - Treat first with 750 mg KCl per liter of rearing water;
 - Then add 20 mg of 40% formalin per liter during transport for minimum of 2 hours.
 - $750 \text{ mg KCl/L} = 2,839 \text{ mg/gal.} = 284 \text{ g/100 gal.} = \mathbf{1 \text{ gal. stock solution/100 gal.}}$
 - $20 \text{ mg of 40\% formalin/L} = 75.7 \text{ mg/gal.} = \mathbf{7.57 \text{ g/100 gal.}}$

Preparation of KCl stock solution from water softener KCl:

Softener salt is 99% KCl and about 0.7% NaCl, so it will work well for us. It comes in a 40 lb. bag, which is enough to treat 6,400 gal. of pond water. To make up a stock solution in advance for future use, dissolve one 40 lb. bag in 64 gallons of water. (This is about 1/4 as concentrated as a saturated solution of KCl at 68F, so it should dissolve okay). Use 1 gal. of the stock solution/100 gal of pond water.

KCl Sources:

Water softener KCl from Dublin Pump, Dublin OH, costs \$8.95/40 lb. or \$0.50/kg.
Reagent grade KCl from Fisher Scientific (Cat. #P217-10) costs \$17.29/kg.

