



Field Gear Disinfection

Waders, Boots, Equipment

1. Prepare appropriate disinfectant and put into a 3-5 gallon weed sprayer to carry in vehicle. *(Choose a disinfectant for species of concern.)*

<p>Chlorine Bleach Formula: 10 -30 minute contact time. Use as dip and must rinse from equipment. Remember to neutralize with sodium thiosulfate</p>	<p>$[\text{target conc(ppm)}] \times [\text{volume of water(gal)}] \times 0.00378 / \% \text{ active ingredient} = \text{mL of bleach to add}$ (assume 1 mL bleach weighs 1 g)</p>	<p>Hard on equipment but inexpensive and easy to find. With proper contact time will work on bacteria, viruses, and most aquatic nuisance species.</p>
<p>Quaternary Ammonium Compound Formula: Use at 400ppm 5-10 min. Use a spray on. No disposal if you make a dip.</p>	<p>$\# \text{ of gallons} \times 3785 = \text{total of ml}$ $\text{total ml} / 1,000,000\text{mL} \times \text{desired ppm} = \# \text{ ml needed}$ X [concentration of active ingredient]</p>	<p>Will work on Virus, bacteria, Whirling disease spores and TAMs, and Aquatic Nuisance Species like NZMS. Deactivated by organic debris.</p>
<p>Virkon Aquatic Formula: 5-10 minutes Use as a no rinse spray on. 1:200 dilution (0.5% solution and 5000ppm) 1:100 dilution (1.0% solution and 10,000ppm)</p>	<p>add 0.65 ounces of powder per gallon of water add 1.3 oz or 37g of powder per gal of water</p>	<p>Works on virus and bacteria. Will work on NZMS, at a 2% concentration with a long contact time of 20 minutes. Easy to dispose of. Safer for use.</p>

2. Remove visible organic debris by rinsing in water at site. *(Stream, Lake, or water pump is fine. This leaves critters that you may have picked up at their site of origin.)*

3. Spray equipment with sprayer when leaving site. *(Contact time is 5 minute minimum. This allows for disinfectant to work between sites)*

4. Clean hands with baby wipes or hand sanitizer. *(Aquatic virus, bacteria, and fungus can be transmitted via water on hands.)*

5. Repeat Steps 2- 4 as needed for each site visited.

6. On way back to office, use a high heat and pressure washer at car wash on large equipment to remove organic debris into sewer. *(You may cleanse and rinse here saving the need to do so at the office. This reduces possible transmission to office area.)*

7. Thoroughly disinfect upon returning to office.

- a. Remove any visible debris from items not rinsed at car wash.
- b. Cleanse with soap and water *(If you did not use cleanser at car wash).*
- c. Rinse all cleanser from equipment.
(Cleansers combining with disinfectants are BAD!)
- d. Spray or dip equipment with disinfectant for 5 minutes.
- e. Rinse with water. *(Depending on Disinfectant type)*
- f. Dry Completely. *(Warm moist areas are preferable to microorganisms.)*

Caution:

**Disinfectants must not be poured into surface waters. The Label is the Law! Dispose of according to label.*

Biosecurity for Aquatic Animal Field Workers.

Many aquatic nuisance species (ANS) and pathogens have been shown to be transferred between waters on fishing equipment, boats, nets, hands and feet of animals. (IHNV, MC, VHS, NZMS, Rana virus, chytrid fungus etc...)

Awareness, proper field gear hygiene and disinfection combined play an important role in preventing the spread of pathogens and ANS from one water body to another.

Things you need to know:

1. Knowledge of water bodies you are working in.
2. Be aware of aquatic species in the water body (ESA? Special management? Fish and amphibians)
3. Be aware of State pathogen concerns and list of ANS.
4. Where ANS/pathogens are found in your state and where are potential introduction pathways

Things you should do:

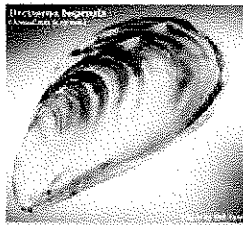
- ****Treat ALL unknown waters as if they are contaminated!**
 - Develop a HACCP Plan. (Hazardous Critical Control Point Plan)
 - If working in a known infested watershed use separate gear (if feasible) and store in separate containers.
 - Travel to pristine "Class A" waters first and "Class B" and "Class C" waters later in the day or week.
 - Rinse gear in water before leaving site, which leaves the mud, debris and critters at their original site.
 - Carry appropriate disinfectant in 3- 5 gallon weed sprayer and spray on disinfectant between sites. Know regulations on disposal and spills.
 - Dry Equipment thoroughly when possible.
 - On way home, run large equipment through car wash with high heat/ pressure to remove debris into sewer.
 - Full disinfection when returning to office.
- (Remove debris, wash, rinse, disinfect, rinse, complete dry)

High Priority Aquatic Nuisance and Invasive Species NOT currently found in Idaho. These species are defined as not currently in Idaho, and likely to have adverse impacts.



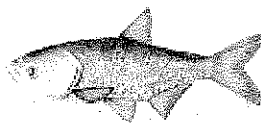
Zebra Mussel

Dreissena polymorpha



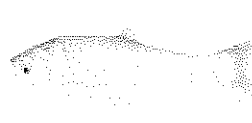
Quagga Mussel

Dreissena rostriformis bugensis



**Asian Carp:
Big Head Carp**

Hypophthalmichthys Nobilis



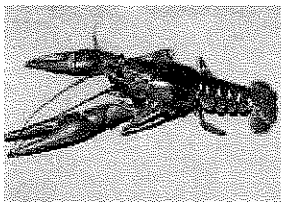
**Asian Carp:
Silver Carp**

H. molitrix



**Asian Carp:
Black Carp**

Mylopharyngodon piceus



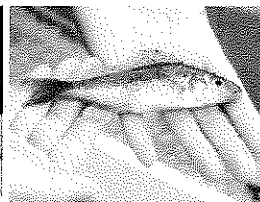
Rusty Crayfish

Orconectes rusticus



Round Goby

Neogobius meolanostomus



Eurasian Ruffe

Gymnocephalus cernuus



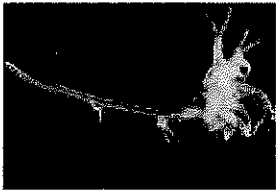
Amur Goby

Rhinogobius brunneus



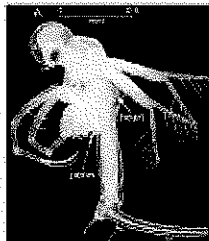
Snakehead fish spp

Canna argus, C. masculata, C. marulius, C. micropeltes



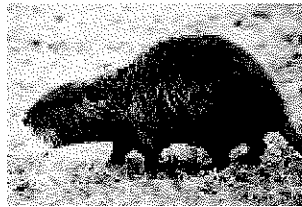
Spiney Water flea

Bythotrphe cederstroemii



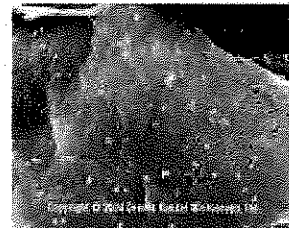
Fishhook water flea

B. longimanus



Nutria

Mycaster coypus

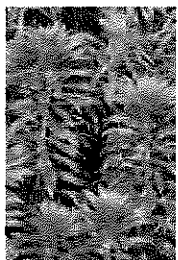


VHS Virus



Water Hyacinth

Eichhornia spp.



Hydrilla

Hydrilla verticillata



Brazillian elodea

Egeria spp.



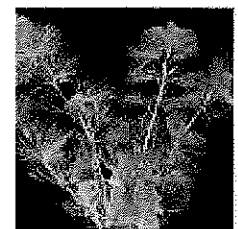
European frogbit

Hydrocharis morus-ranae



Water-chestnut

Trapa natans



Carolina fanwort

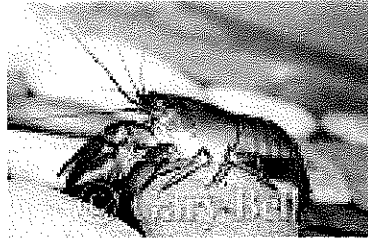
Cambomba spp.

Red Claw Crayfish



Cherax quadricarinatus

Yabby Crayfish



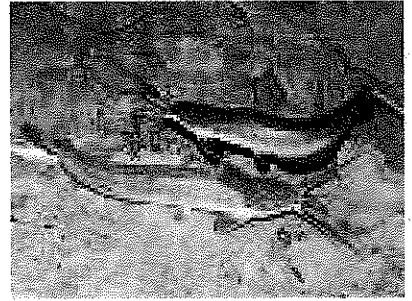
Cherax albidus destructor

Marone Crayfish



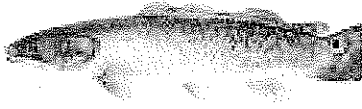
Cherax tenuimanus

Walking catfish



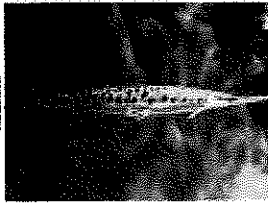
Claridae

Bowfin



Ania calva

Gar



Lepiostidae

Green Sturgeon



Acipenser Medirostris

Ido



Leuciscus idus

Diploid Grass carp



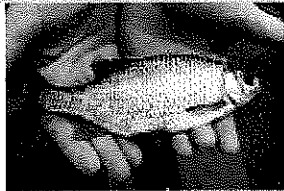
Ctenopharyngoden idella

Piranhas



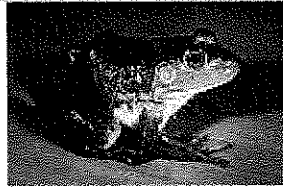
Serrasalmus spp
Rossevtiella spp
Pygocentrus spp.

Rudd



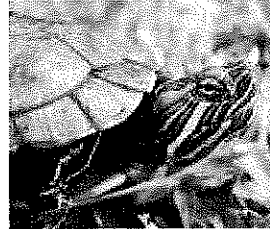
Scardinus erthroptalmus

Bullfrog



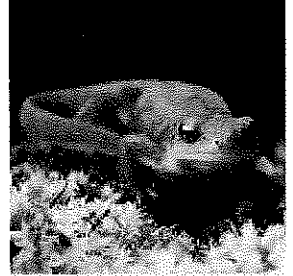
Lithobates catesbeinus

Red eared slider



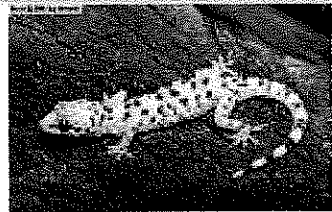
Trachemys scripta elegans

Rough Skinned Newt



Taricha granulose

Mediterranean gecko



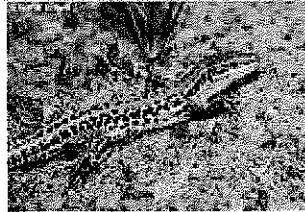
Hemidactylus turcicus

Common wall lizard



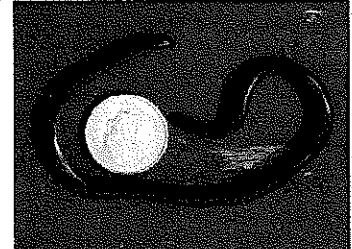
Podarcis muralis

Italian Wall Lizard



Podarcis sicula

Brahminy blindsnake



Ramphotyphlops braminus