Standardized Protocols for Maintaining Biological Security During Biological and Water Quality Surveys

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Purpose: These protocols are to establish formal operating, reporting, and decontamination procedures to prevent the spread of invasive/alien plant or animal species, biological viruses, pathogens, fungi, contaminants, or other detrimental factors from one surveyed water body/sampling location to another during the course of performing biological and water quality surveys.

No protocol can comprehensively cover all of variations of the entities listed above, but these field procedures should minimize the probability of alien/invasive transfers or viral/bacterial infections most prevalent in the New England Region. Strict adherence to these protocols is required while conducting surveys.

Pre-survey Planning

In the process of pre-survey planning, considerations need to be made as to the present disposition of the water bodies to be surveyed. Preliminary inquiries should be made to determine if the water bodies presently contain invasive plant/animal species, or if viral/bacterial agents have been reported or are present. Surveys spanning separate water bodies, or encompassing large contiguous stream/river reaches, especially over consecutive days, should be conducted in a manner whereby the most "pristine" sites are completed first if possible, thereby minimizing possibilities of cross contamination/transfer among sites. This in most cases will mean working from an upstream to downstream direction whenever possible in order to avoid spreading invasives further up into a watershed. Decontamination procedures should take place in all waters where the habitat is suitable for invasives, with the presumption being that they may already exist in the waterbody but as yet have not been detected.

Equipment recommendations

The equipment choices made for surveys may have a large influence on the susceptibility of transfer of environmental contaminants. Avoid absorbent porous material whenever possible. Use of felt soled waders, wading boots, should be replaced with cleated or studded wading boots. Carpeted boat decking and trailer bunks should be replaced with impervious decking material or their use avoided. If use of these types of materials is unavoidable, then extra diligence and care will be necessary during the decontamination process. The use of vessels with hull designs containing thru hull fixtures or hardware that take on and retain water should be minimized.

Decontamination Personal Protection Equipment (PPE)

The PPE for decontaminating equipment should consist of rubber gloves and laboratory safety glasses at a minimum. Long sleeved shirts and pants should be worn when using corrosives (bleach) and a plastic/rubber apron to keep overspray off of the clothing. Avoid contact with skin and clothing.

Decontamination procedures

The decontamination/disinfection products listed have been selected based on their relevancy to known pathogens/contaminants of concern to fisheries in the region and the existence of invasive aquatic plant species presently found in New England. The proper use of these products, along with sound sampling plan designs and equipment choices, should provide a high degree of protection against the transfer and propagation of these environmental stressors/contaminants.

The level of decontamination employed is a hierarchical approach based on the level of perceived risk of transferring invasive or pathogenic entities. Visual inspections of all equipment are to be made at every site before and after the survey, regardless of the condition of the resource. Any survey sites known or suspected to have invasive plant/animal species or pathogens need to follow the procedures listed below. It is the responsibility of the project manager to know the sites and their current disposition, as well as to employ the appropriate decontamination procedure and ensure that field crews have been appropriately trained in these protocols. The procedures used at a site will be recorded in the field log book.

1. All organic matter, plant fragments, and miscellaneous debris should be removed from nets, traps, temporary holding pens, boots & waders, gloves, anchor lines & chains, boat trailers and vehicles, and all other surfaces that have come into contact with ambient water, potentially contaminated sediments, fish, or other aquatic biota. Any material found after leaving the site should be disposed of in the trash and not flushed down any drains.
2. One of two disinfectants may be used as described below. All appropriate small field gear (gloves, waders, nets, anode rings, rat tails, etc.) should be immersed in a large plastic waste barrel utilizing a 2% solution of chlorhexadine diacetate (i.e. Novalsan) for a period of 15 minutes, or one ounce of 65% available Chlorine powder to twenty three gallons of water to obtain a 200 ppm solution. The latter is an inexpensive alternative using a “wetted time” of 20-30 minutes. Equipment that cannot be immersed (i.e. boats and trailers) should be disinfected utilizing a portable hand sprayer.
3. Chlorine solution is corrosive and will deteriorate neoprene, cloth, rubber seals, and other materials. The materials should be thoroughly rinsed in fresh water after soaking. Rubber intake and discharge lines, pumps with rubberized components on vessels, should all be checked frequently for deterioration.
4. Vehicles, boats, and trailers should be power washed at a commercial car laundry in between sites if operating in consecutive days and disinfection procedures

applied. Live wells, holding tanks, thru hulls, intake lines and discharge lines should be thoroughly flushed with the prescribed chlorine disinfection solution and then subsequently rinsed with fresh water.

5. Outboard motor cooling systems should be flushed out with decontamination solution for the specified minimum of one minute's time then let stand for 15 minutes. It should be flushed again with clean fresh water that has come from a town water supply.

6. Flush the interior of your boat with the disinfecting solution and then use the bilge pump to expel residual water before opening the bungs if possible. Some residual decontamination solution may be left in the bilges to "slosh" and continue deconning during travel provided no below deck equipment will be damaged in the process and the bilge water is disposed of properly. Care must be taken to ensure that this material is not carried over to another water body.

7. Mats, deck carpeting, anchor lines and other absorbent and porous materials should be thoroughly soaked with decontamination solution, allowing extra time for the solution to fully saturate the item. If possible, avoid using equipment that has these materials on board as part of your surveys. Chlorinated disinfectants will bleach out carpeting and other fabrics.

<u>Invasive/Alien Species reporting</u>

- A comprehensive post survey report will be written describing the species and external disposition of individual fish, or the presence of other aquatic invasives. In most cases for fish this will include species, age class, length, weight, and any signs of physical or behavioral anomalies.
- Fish will be examined for deformities, fin erosions, fungi, lesions, and tumors, external parasites, and visible signs of viral/bacterial hemorrhagic infections. Fish will be retained for further pathological examination at the discretion of the survey fisheries biologist, or with consultation with the state agency biologist whose jurisdiction the survey has taken place. Photos may be taken to accompany voucher collections or pathology.
- All fish collected during a survey will be reported on and submitted to the appropriate state fish & wildlife agency and notations made as to their disposition.

To prevent the spread of viral/bacterial fish infections, the following guidelines should be adhered to:

- Do not transport fish from one body of water to another
- Only put fish back into the water body it was taken from
- Do not dispose of fish carcasses or by-products in any body of water.
- Remove all mud, aquatic plants and animals from all gear, boats, motors and trailers before leaving a body of water;

- Drain your live well, bilge and bait tanks before leaving the water you are fishing or boating on. Any water body known or suspected of being infected or having invasive plant/animal species need to follow the disinfection guidelines.

Resources:

New England Invasive Species:
http://www.epa.gov/ne/topics/ecosystems/invspecies.html

Didymosphenia geminata
http://www.issg.org/database/species/ecology.asp?si=775&fr=1&sts

USFWS Decontamination protocols
http://www.fws.gov/sacramento/es/documents/crf_survey_guidance_aug2005.pdf

Maine Department of Inland Fisheries and Wildlife. 2005. *Fisheries Staff Biosecurity and Disinfection Guidelines for Field Work (Draft).*

Maine Atlantic Salmon Commission. 2005. *Disinfection Procedures (Draft).*