

APPENDIX IX: DISINFECTION PROCEDURES FOR INVASIVE SPECIES IN VESSELS AND WATER WETTED EQUIPMENT

Definitions

Vessel-The word vessel includes every description of watercraft or other artificial contrivance used or capable of being used as a means of transportation on water.

Water wetted equipment-Water wetted equipment refers to water wetted resources being utilized between infected water and uninfected waters.

Purpose

Aquatic invasive species are waterborne, non-native organisms, including plants, animals, and pathogens, that can threaten ecosystems into which they spread or are introduced. Aquatic invasive species can compete with native species for food and habitat, prey on native species and kill them through disease processes, disrupt ecosystem stability, impact water quality, impact commercial and recreational activities, affect property values, and cost millions of dollars in prevention and control. The long term impacts of invasive species on an ecosystem can easily exceed those of an oil spill.

Aquatic invasive species may be introduced via vessels and water wetted equipment that are from waters outside of the region, as well as vessels that have been used in more local, but separate, waterways. For example, viral hemorrhagic septicemia is a fish virus that is present in the Great Lakes, but is not yet present in most inland lakes. The movement of vessels and water wetted equipment between infected waters and uninfected waters may spread the virus.

Process

For the purposes of this RCP/ACP, the term Disinfection Procedures should be considered distinct from Decontamination Plan. The purpose of disinfection is to prevent the spread of invasive organisms that may be present on vessels or water wetted equipment into or out of the spill area; whereas, the purpose of decontamination is to remove oil or other contaminants after use in the spill area. Thus, disinfection should occur **before** vessels and water wetted equipment are used in the spill area as well as **after**, when they are demobilized from the area.

The Disinfection Group, under the oversight of the appropriate state environmental agency, U.S. Fish and Wildlife Service (USFWS), or local water resource manager is responsible for the implementation of the Disinfection Procedures.

At a minimum, all vessels and water wetted equipment, coming from either 1) a distinctly separate water (salt vs fresh water, a different water shed, an isolated waterbody etc...), or 2) coming from downstream of a dam or falls, will need to pass an inspection for the need for disinfection prior to being allowed into the water. This could be coordinated with the vessel safety inspection. A sample checklist is attached to the Disinfection Procedures, but this checklist may need to be tailored to specific threats related to the expected source areas for vessels and water wetted equipment. Following inspection, boats and equipment that could be carrying invasive species in any form must go through disinfection.

Disinfection areas will be established onsite during a spill response. The disinfection areas may be co-located with decontamination areas, staging areas, or vessel inspection areas. Disinfection areas must be configured to contain all wastewater for proper disposal. Disinfection wastewater must not be allowed to drain onto unpaved surfaces or into sewers, ditches, or waterways.

DISINFECTION PROCEDURES

The following techniques are acceptable for disinfection of vessels and water wetted equipment. Contact time is crucial for complete disinfection. Contact time reflects exposure of air, water, or disinfectant to a specific area, and not the total amount of time spent disinfecting. For example, if you are using 70° C water to disinfect your vessel, you must apply 70° C water to each area for one minute or longer (see options and procedures below from USFWS, Region 3).

Methods	Procedures	Positives	Negatives
Heat + air (Drying in hot sun)	30C (86F) 24 hrs minimum (time at Temp contact period crucial) (Exposure to Hot sun/air while dry)	Follow MSDS directions for health risk and use Personal Protective Equipment (PPE).	Time consuming Weather/Temperature criteria critical to reliable results
Heat + water Spray &/or immerse	50C (122F) contact time for 10 minutes (time at temp contact period crucial) (Large source of hot water needed)	Follow MSDS directions for health risk and use PPE.	Must maintain high water/contact; hotter than average tap water
Heat + water Spray &/or immerse	70C (158F) contact time for 1 minute (time at temp contact period crucial) (Large source of hot water needed)	Follow MSDS directions for health risk and use PPE.	Must maintain very high water/contact; much hotter than average tap water. Risk of Burns. Requires additional logistical support for steady supply of fuel.
Virkon Aquatic	Follow Product directions for Proper mixture and minimum contact time. (immerse in solution, Apply directly, or Spray-on with pressure washer and rinse)	Follow MSDS directions for health risk and use PPE.	Follow MSDS directions for health risks and use PPE) when mixing concentrate form. Chemical based
Quarternary Ammonium+Water *(family of products)	Follow Product directions for Proper mixture and minimum contact time. (immerse in solution, Apply directly, or Spray-on with pressure washer and rinse)	Follow MSDS directions for health risk and use PPE.	Chemical Based Follow MSDS directions for health risk and use PPE.
Chlorine + water	Min. 200 mg/liter water for 20 minutes (immerse in solution, Apply directly, or Spray-on with pressure washer and rinse/neutralize thoroughly)	Follow MSDS directions for health risk and use PPE.	Follow MSDS directions for health risk and use PPE. Highly corrosive.

An example equipment list for the disinfection station follows:

- Four steam pressure sprayers or disinfectant sprayers, depending on method
- 200 gallon diesel storage with secondary containment
- 100 feet of caution tape
- Six free-standing guide posts
- Two 55-gallon drums – open top with lid
- Two 55-gallon drums – open top with bung opening lid
- Eight packs of sorbent wipers (minimum 50 pads each)
- Two plastic buckets and two scrub brushes
- Two child wading pools
- Labels for drummed waste
- Four 50-foot garden hoses with variable spray nozzles
- Four 20-gallon plastic trash cans
- PPE for a minimum 4 person team (Face shields, Tyvek suits, PVC Gloves, booties, and respirators depending on cleaning chemicals)
- Vacuum truck for waste water recovery
- Absorbent boom
- Portable containment pad or other containment system
- One or more frac tanks or other storage containers to contain wastewater

Sample Checklist

The procedures in this document will focus on expectations of inspection criteria of vessels, vehicles and their trailers, as well as, equipment entering Regional Response Team 5 waters. The recommended inspections procedure is being implemented to ensure that invasive species do not enter the waterways of Region 5 and impact treatment infrastructure and threaten the ecosystem.

The vessel, trailer/vehicle and equipment inspection will include looking for water, debris or growth on or in any inspected area. Surfaces will also be touched to see if growth or mussels may be attached. The inspection should be completed the same way each time starting at one side and ending up at the other side.

Below are the recommended procedures for what to inspect.

Inspection Checklist

The following list of items comes from the Vessel Inspection Checklist and states what the Disinfectant team should be looking for:

- (a) **Vehicle Rear:** The vehicle bumper, tailgate or spare tire may have mud, grass, weeds or other debris on it.
- (b) **Trailer Structure, Railings and Spare Tire:** The trailer, railings and spare tire may have mud, grass, weeds, debris or standing water.
- (c) **Vessel Hull:** The vessel hull should be inspected for growth and debris. Growth may be visible if it has recently come from being in the water for an extended period of time. Small mussels attached to a boat can feel like sandpaper or sesame seeds.
- (d) **Transom:** The transom is at the back of the vessel that the engine is attached to. The transom may have several items of importance to inspection that mussels can attach to including the outdrive, trim tabs, transducers, bilge plug area and through hull fittings. Check the transom to make sure the surface is smooth and visibly clear of all debris and growth.
- (e) **Outdrive:** The outdrive is attached to the transom on stern drive vessels and the lower unit on outboard vessels. It has intricate parts that make it easy for mussels to attach, hide and grow. The inspector should feel and look for any signs of growth, debris or texture of sandpaper.
- (f) **Propeller/Shafts:** Mussels can attach and live on or around where the propeller attaches to the lower unit of drive shaft. Mussels can also attach to the shaft or connecting points of the vessel. These can be hard to see and should be inspected with a flashlight to verify if any mussels, debris or water is present.
- (g) **Trim Tabs:** Trim tabs are located on the lower portion of the transom and are usually metal plates that help stabilize the vessel while underway. The inspector should feel the corners, edges and look on the underside of the trim tabs for debris and growth.
- (h) **Transducers:** These are located on the transom or bottom of the hull near the stern of the vessel. They are used in conjunction with a computer to determine depth, speed and water temperature. Growth or debris can appear on them.
- (i) **Bilge Plug:** If the bilge plug is pulled when the vessel arrives at the lake, there should be no fluid or debris coming from it. By carefully putting your finger in the plug hole, it can be determined if debris is blocking water from exiting. If the bilge plug is not pulled, have the owner/operator pull the plug. If water exits, place the plug back it to prevent it from coming out.
- (j) **Through Hull Fittings:** Through hull fitting in all boats have the potential to store mussels in the right conditions. To check these fittings, look with a flashlight inside them and feel for irregularities.
- (k) **Bait Tank/Live Well/Compartments:** Bait tanks, live wells and compartments should be dry and clear of all water and debris. Some compartments do not drain completely due

to the way they are manufactured. Any debris in compartments is not acceptable. Common debris often found includes; fish scales, weeds, small pebbles and trash.

- (l) **Bilge:** The bilge is at the bottom of the inside stern of the vessel. It may not be visible in all boats due to various boat designs. The bilge should be clean from all water and debris.
- (m) **Anchor/Fenders and Line:** Anchors can have mud or debris on them. If an anchor, fender and lines attached have been in infested water for an extended period of time then mussels and debris can attach. Check these items for mud, growth and debris.
- (n) **Trolling Motor:** Trolling motors can pick up plants and debris while being used and must be inspected. Check these items for mud, growth and debris.

The Disinfectant Team will determine if vessel has been used locally or non-locally. If the vessel is local and there are no visible signs of mussels, plants, mud or other type of species, approve for launch, otherwise, disinfect.

Disinfectant Team will conduct a complete inspection for non-local vessels. If vessel passes inspection, approve for launch, otherwise, disinfect.

If Disinfectant Team determines vessel is a viable threat to the Great Lakes ecosystem and is not confident that disinfecting the vessel would protect the water quality, quarantining the vessel for 28 days is another option.

Sample Checklist:

Inspection: Check for **WATER, MUD, DEBRIS** or **GROWTH** and check all smooth surfaces for **“SANDPAPER”** feel.

Clear of Water, Debris and/or Growth: Check appropriate box below.

Yes No

- Vehicle rear
 - Trailer structure, railings, spare tire
 - Vessel hull
 - Transom
 - Outdrive
 - Prop/shafts (propeller on the engine)
 - Trim tabs (located on back of hull near engine. Not all vessels have them)
 - Transducers
 - Bilge plug pulled – no fluid or debris
 - Through hull fittings
 - Bait tank/live wells/compartments
 - Bilge (may not be visible)
 - Anchor/fenders and line
 - Boom
 - Skimmers
 - Other Response equipment
- Your vessel has not cleared the inspection due to water and or debris in one or more areas. Your vessel will not be allowed on Region 5 waters for a minimum of 28 days and will be placed on a vessel quarantine list as of today. This zero tolerance has been established to ensure the safety of the water quality and its ecosystem.
- Your vessel will need to be disinfected before it can be cleared to enter Region 5 waters.
- OK to enter Region 5 waters.

Date

Staff (Print Name)