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Utah Decontamination Protocols

To Minimize Risk for Introduction or Spread of Aquatic Invasive Species

(Revised 4-18-12)

- (1) For boaters and anglers.
- (2) For wildlife constituents seeking a Certificate of Registration:
 - (a) To conduct fishing tournaments;
 - (b) To collect, import or transport aquatic wildlife; and
 - (c) To conduct other allowed activities in aquatic environments.
- (3) For operators of construction and heavy equipment, vehicles, vessels, and other equipment working in or around lakes, streams, wetlands, riparian areas or other waterways.
- (4) For natural resource management personnel working in or near aquatic ecosystems:
 - (a) To conduct fish, wildlife & habitat management or waterway assessments;
 - (b) To conduct outdoor recreation management; and
 - (c) To conduct fire suppression or management.

Many aquatic invasive species (AIS) live in Utah, and they span fungus, algae, plants and animals; some of their life forms are microscopic. You can learn more about AIS in the Utah Aquatic Invasive Species Management Plan at <http://wildlife.utah.gov/dwr/invasive-mussel-plan.html>. Utah Division of Wildlife Resources needs your help to control the spread of AIS, since they will harm Utah's vast, complicated water distribution systems, world-class recreation areas, including economically and environmentally valuable fish resources. On a personal level AIS can damage your wetted equipment. Please don't arrive or move about in Utah with dirty (attached mud and attached vegetation) or wet equipment, or equipment holding raw water from a natural source. Unknowingly, dirty, wet equipment may harbor AIS; some species can live out of the water for 30 days. So, always clean, drain and dry your equipment.

- (1) All boaters must properly fill out and display in their launch vehicle a Decontamination Certification Form each time they launch a boat in Utah (Rule R657-60).
 - (a) An online Mussel-Aware Decontamination Certification Form (<https://dwrapps.utah.gov/wex/dbconnection.jsp?examnbr=505728>) is available to all boaters and can be used for multiple launches throughout the year in which it is issued.
 - (1) Boat operators participating in a fishing contest must successfully complete the online Mussel-Aware Boater orientation and certification course as per Rule R657-58.
 - (b) A single launch Decontamination Certification Form is also available to boaters at most boat launch sites or at http://wildlife.utah.gov/mussels/PDF/self_certify.pdf.
 - (c) Allowable boat decontamination procedures are specified in Rule R657-60 and herein.
- (2) Certificates of Registration can be issued by Utah Division of Wildlife Resources for a variety of reasons that extend beyond opportunities authorized by a hunting or fishing



license. Regarding activities governed by Certificates of Registration associated with aquatic environments, folks can seek opportunity to conduct fishing tournaments under authority of Rule R657-58 Fishing Contests and Clinics; and seek opportunity to handle aquatic wildlife under authority of Rule R657-3 Collection, Importation, Transportation, and Possession of Zoological Animals. Applicants can also seek opportunity under authority of a Certificate of Registration for other activities impacting aquatic environments and species, too. All such Certificates of Registration will stipulate compliance with Utah Decontamination Protocols contained herein, which are routinely revised for purposes of updating information.

- (3) Construction activity in or around lakes, streams, wetlands, riparian areas or other waterways are regulated as follows:
 - (a) In part by Rule R657-60 to the extent that associated equipment and vehicles can become a “conveyance,” potentially harboring or transporting AIS.
 - (b) Additionally, development activity in Utah is reviewed by the Resource Development Coordination Committee in the Governor’s Office of Public Lands Policy Coordination. They recommend stipulations to protect Utah’s environment. Land management agencies (federal and state) typically adhere to the recommended stipulations, which may include the AIS decontamination protocols contained herein.

- (4) Natural resource management personnel—federal, state, local and private--in Utah routinely conduct operations within or proximal to aquatic environments that could inadvertently spread AIS. Each agency should have a Hazard Analysis Critical Control Point plan (<http://www.HACCP-NRM.org>), aiding them to identify potential risks relative to AIS. The AIS decontamination protocol contained herein should become a part of each agency’s plans.

When recreation or work will occur proximal to a fish culture facility, or within lakes, streams, wetlands, riparian areas or other waterways, all previously wetted equipment should be decontaminated before arrival in Utah. Wetted equipment originating from within Utah should be decontaminated before leaving its last project site. All wetted equipment should again be decontaminated prior to leaving any project site within Utah.

AIS may live within one stream segment or body of water, but may not yet occur either upstream or downstream or even in another arm of the same lake. So, decontamination must occur on a site-by-site basis not drainage-by-drainage. Keep in mind that decontamination results in the kill of AIS, while cleaning alone, which is one of several steps in the decontamination process, simply removes undesirable material.

Wetted equipment to be decontaminated may include, but is not limited to footwear, gloves, personal flotation devices, and other wetted personal gear; angling, recreational and survey or sampling equipment to be used in the water, including fishing gear, water toys, traps, nets, live cages, holding boxes, coolers, scales, ropes, anchors, buoys, and other associated equipment; boats, barges, other watercraft, flotation platforms, floatplanes, including their trailers and any conveyances as defined by Rule R657-60; water haul equipment, including pumps, hoses, strainers, valves and tanks; vehicles (rubber tired or tracked), especially parts that become wetted; wetland crossing mats and shoring boxes; or any other wetted equipment having contact with raw water, the “green strip,” or aquatic animals.

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Subject: Utah Decontamination Protocols for AIS

Stage preparatory activities for recreation or field operations sufficiently away from the water body or its “green strip” to minimize unnecessary contact by equipment with potentially AIS affected areas. This will avoid inadvertent contamination of equipment. For example New Zealand mudsnail have been found in the “green strip” more than 40 feet from the water’s edge.

Accepted decontamination protocols for Utah follow:

The decontamination process is for the sole purpose of killing and removing AIS to avoid inadvertent transfer between one locale and another. Desiccation either by drying, scalding water wash (140⁰ F) that includes high and low pressure to remove attached AIS, or freezing (less than 32⁰ F for more than 72 consecutive hours) is effective at killing all life forms of AIS. And, in limited situations some chemicals are helpful. However, any use of decontamination chemicals must be limited to agencies/persons with pesticide applicator permits and Hazard Analysis Critical Control Point plans that address licensed application purpose and application rates, disposal concerns, and user safety issues.

Decontamination areas that involve draining of equipment, wash down or professional decontamination should not be sited in locales that would allow refuse water, even during a precipitation event, to reach lakes, streams, wetlands, riparian areas or other waterways. Always be cognizant of storm water drains and avoid them, too. Refuse water carrying potential contaminants (soil, seeds, animals, petroleum residue, cleaning chemicals, etc.) must be managed to either soak into the soil mantel, evaporate or be appropriately captured for disposal. Decontamination areas should be large enough to safely accommodate all vehicles and personnel before, during, and after decontamination operations. Additional detailed procedures and methods for decontaminating heavy equipment, vehicles, vessels, and other equipment can be found in Appendix B of “Inspection and Cleaning Manual for Equipment and Vehicles to Prevent the Spread of Invasive Species,” U.S. Dept. Interior, Bureau of Reclamation (2009), Technical Memorandum No. 86-68220-07-05. It is also available online at http://wildlife.utah.gov/mussels/PDF/tech_inspection_cleaning_manual.pdf.

Utah law (Rule R657-60) only recognizes two AIS decontamination protocols; self-decontamination or professional decontamination.

1. Self-Decontamination (Utah’s preferred method)

- a. **CLEAN** off (remove) all visible attached mud, debris, plants or animals from wetted equipment, then kill specimens that are alive, including fish bait, and properly dispose. Wipe down boats with a towel, and scrub other equipment with a stiff-bristled brush to dislodge anything that is stuck. Then visually inspect, since AIS (seeds, spores, plant shards or the animal itself) frequently collect in seams, crevices or cracks on equipment or between the laces and tongue of wading boots. Regarding wetted construction equipment, specifically inspect tires, rims, fender wells, bumpers, axles, shock absorbers, tensioners, support rollers, beneath rubber or gridded areas, beneath fenders, under casings, grills, and other places that could hide AIS. Follow the cleaning and inspection with a tap water rinse, where possible, or rinse with raw water from the project site. Then proceed to the drain and dry steps.

Use of felt-soled wading boots is discouraged in Utah. The felt is easily invaded by some AIS, particularly New Zealand mudsnail, and the felt does not easily dry making it ideal for inadvertent spread of AIS.

Although soaps and some chemicals can aid in the cleaning step for wetted equipment, care for the environment must be at the forefront of attention—follow label instructions to protect the aquatic environment! Equipment must be drained of raw water before using soaps and chemicals, so they don’t become diluted and ineffective. Disposal of soaps and chemicals or refuse water

containing them must not allow their entry into waterways or any water body, nor should chemicals be allowed to enter a municipal wastewater treatment plant. Chemicals may kill desirable biota in nature and at a wastewater treatment plant.

No chemicals are currently approved as a sole decontamination effort for boats or other wetted equipment in Utah as per Rule R657-60.

Bleach—sodium hypochlorite (e.g. Clorox^R): Generally, bleach requires a long exposure time in order to kill a wide spectrum of AIS; and bleach is damaging to the aquatic environment, equipment and its seals. So, bleach should not be used in the cleaning step for decontamination of equipment.

Copper ions: Copper ions, released by several copper compounds, are not known to kill a wide spectrum of AIS, generally requiring a long exposure time to kill limited target AIS. Copper ions also can be fatal to desired aquatic organisms. So, copper ions should not be used in the cleaning step for decontamination of equipment.

The following chemicals will kill whirling disease spores, didymo (AKA rock snot), New Zealand mudsnail, and invasive mussel veligers, but not adults, for quagga and zebra mussels during the cleaning process.

Quaternary Ammonium Compounds: An array of small to large wetted equipment (e.g., sampling equipment, wading boots, water toys, seaplane pontoon compartments, water-haul tanks, crane water weight bags, fire suppression equipment, etc.) can be cleaned with Quaternary Ammonium compounds--alkyl dimethyl benzyl ammonium chloride (ADBAC) or diethyl dimethyl ammonium chloride (DDAC) as a cleaning step in the decontamination process. It should be expected that a 100% kill for whirling disease spores, didymo (AKA rock snot), New Zealand mudsnail, and veligers, but not adults, for quagga and zebra mussels can be achieved. None of the chemicals specify kill of aquatic invasive species as an accepted use on their labels, but research has shown that the aforementioned AIS die after varying concentrations of chemical and exposure times as follows:

- *Quat 128, sold in bulk as a 7.7% solution, will kill at 4.6% achieved by mixing 6.4 oz Quat per gallon of water or 5 gallons Quat per 100 gallons of water;
- *Sparquat 256, sold in bulk as a 12.5% solution, will kill at 3.1% achieved by mixing 4.1 oz Sparquat per gallon of water or 3.2 gallons Sparquat per 100 gallons of water;
- T-San, sold in bulk as a 10% solution, is equivalent to Sparquat 256, and is manufactured & sold in Salt Lake City by Thatcher Chemical.

*When using T-San, Quat 128 or Sparquat 256, equipment needs to be immersed or repeatedly sprayed, keeping it damp for 10 minutes, followed by drying in the sun for one hour before re-use. Both chemicals can be purchased at local chemical or swimming pool supply outlets.

- Clorox^R brand's Formula 409 "All Purpose Cleaner Antibacterial Kitchen Lemon Fresh" and "Antibacterial All Purpose Cleaner" are only sold in small quantities as a 0.3 to 0.6% solution of [dimethyl benzyl ammonium chloride](#). When using Clorox^R Formula 409, equipment needs to be immersed or repeatedly sprayed, keeping it damp for 30 minutes, followed by drying in the sun for one hour before re-use. Clorox^R Formula 409, which does not contain bleach, can be purchased at most neighborhood markets.
- b. **DRAIN** all raw water from boats, construction equipment or other wetted equipment to prepare it for drying. Make sure raw water circulation systems (pumps & hoses) or containers (coolers and sample containers) holding raw water are drained, including cooling systems,

live wells, ballasts, bilge, and boat motors. Regarding boat motors, let the lower unit down for 1 minute, so water in it drains out (raise the lower unit before driving away to avoid damage), since its operating temperature is suitable internally for survival of some AIS. Typically water temperature in the motor's upper unit is hot enough to kill AIS.

Keep in mind that when a boat is launched and the motor started, it discharges retained water into the new water body, so draining is critically important. For example, water (1.5 liters) collected pre-launch from the lower unit of a boat at Lake Powell in the Glen Canyon National Recreation Area on March 24, 2011 (the boat had been in Lake Mead the previous day) evidenced 19 alive quagga mussel veligers.

- c. **DRY** boats, construction equipment and other wetted equipment as a final step to kill undetected AIS, some of which can live out of the water for as long as 30 days. Temperature and humidity affect drying time, so in Utah in the areas where most people live dry time is 7 days in summer (June, July & August); 18 days in Spring (March, April & May) and Fall (September, October & November); and 30 days in Winter (December, January & February). Due to occasional extended freezing temperatures in winter, properly winterized equipment can be exposed for 72 consecutive hours of subfreezing temperature to kill AIS.

Exact dry time per month for specific locations in the United States can be determined by using the 100th Meridian Initiative's "Quarantine Estimator for Zebra-Mussel Contaminated Boats" at <http://www.100thmeridian.org/emersion.asp>. Although the estimator was designed for zebra mussels, which survive for as long as 30 days out of the water and likely survive longer than the other AIS, it is believed to be suitable for determining dry time for all AIS.

2. Professional Decontamination (Utah's alternative to Self-Decontamination)

The first step in preparing for a professional decontamination is to drain all raw water from the boat, construction equipment or other equipment. Then use a professional decontamination service to apply low and high pressure (3,000 psi) scalding water (140⁰ F) to wash the inside and outside areas of boats and other equipment exposed to raw water (e.g., trailers, truck wheels, sampling equipment, etc.). Then flush raw water circulation systems with the same low and high pressure scalding water. Application of the scalding hot water must last at least 10 seconds to kill AIS, particularly adult sized quagga and zebra mussels.

If invasive mussels or other AIS were **dead** prior to professional decontamination, the boat or other equipment is immediately ready for re-use, once all AIS are removed and properly disposed. If invasive mussels or other AIS are present, and **alive**, the boat should be quarantined after the initial professional decontamination for a sufficient length of time depending on the season to kill any undetected invasive mussels or other AIS via desiccation. The length of time for quarantine equates to dry time for the aforementioned self-decontamination process. After quarantine, the boat or other equipment should be again professionally decontaminated.

Locations for professional decontamination service can be determined at www.wildlife.utah.gov/mussels/decon_units.php.

Additional information about AIS in Utah can be learned at <http://wildlife.utah.gov/dwr/invasive-mussels.html>. Everyone's help in keeping AIS from either arriving in Utah or contained to areas already infested is appreciated.