Standard Operating Procedures (SOP)

Protocols for Decontamination after Sampling Water Resources with AIS

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Forward

This document is specific to the lake, stream, wetland and groundwater chemistry and bacteria sampling conducted or supported by MPCA staff. Procedures outlined cover basic agency decontamination procedures for condition monitoring (Intensive Watershed Monitoring) activities on all lakes and stream reaches in Minnesota. For further information, please consult the Water Quality Programs Sampling and Monitoring Standard Operating Procedures (September 2006).

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Overview

Scope and Application

The following Standard Operation Procedure (SOP) describes procedures to be carried out by field personnel when monitoring lakes, rivers, streams, wetlands and ground water sites. The procedures described seek to reduce or prevent the transport of mature and immature life stages of invasive and/or harmful species or pathogens (hereafter called "invasives") including: eggs, veligers, pollen, seeds or vegetative propagules of invasive aquatic invertebrates, plants, and pathogens identified by the Minnesota Department of Natural Resources (MDNR).

Required Permit

Field Personnel must apply for a permit to transport water from designated infested waters, download and print the following application form or request that a form be sent to you by mail. Complete the form furnishing all requested information and supporting documents. Submit the application per the instruction on the form. There are no fees for this permit. Minnesota Rules allow up to 90 days for the Department of Natural Resources to act upon the permit application.

http://www.dnr.state.mn.us/waters/watermgmt_section/appropriations/permits.html#infested

Summary of Method

Sampling water resources infested with invasives entails pre-planning to attempt to sample infested waters last, and then carefully decontaminating equipment and field gear after sampling to remove seeds, veligers, and plant material. No single decontamination procedure can be applicable to all sampling situations, but thoroughly rinsing field clothing and gear after monitoring is a standard practice. Designated equipment should be purchased for sites infested with zebra mussels (*Dreissena polymorpha*) or spiny water flea (*Bythotrephes cederstroemi*). If designated equipment is unavailable, equipment should be decontaminated or dried per DNR recommendations before use on any additional lake sites.

Health and Safety

As stated in the MPCA's sampling SOPs, field staff should not sample during adverse conditions (presence of lightning, swift current/flooding, gusts/waves greater than the boat can safely navigate). If lightning is present, samplers should return to the field vehicle and wait a minimum of 20 minutes from the last visible lightning flash before returning to the water.

All MDNR boating safety rules and regulations must be followed when monitoring by boat. By law, personal flotation devices (PFDs) must be easily accessible (not in storage) when the boat is in operation and /or occupied, including throwable (Type IV) PFDs. MPCA policy requires MPCA staff to wear PFDs while on the water, and we strongly recommend this practice for other field sampling staff. The motor kill switch should be attached to the boat operator (clip to PDF or wrap around wrist) to prevent loss of control should the operator fall out of the boat.

Personnel Qualifications/Responsibilities

Field samplers must be familiar with proper basic sampling techniques, sample handling, safety procedures, and record keeping. New samplers must be trained and accompanied in the field by experienced staff until competence is assured. Refresher training events should be held each spring for permanent field staff. Student workers will be provided written SOPs/instruction and be trained in the field.

Field crew leader

The field crew leader is responsible for implementing the action steps of this protocol and ensuring that this and other protocols are followed during all sampling activities. It is primarily the field crew leader's responsibility to determine the proper level of concern, and the extent to which decontamination practices in accordance with this protocol must be used.

Field assistant/intern
The field assistant/intern is responsible for implementing the action steps of this procedure including the maintenance, stocking, and storage of sampling equipment; data collection; and data recording. The field assistant/intern is encouraged to use his/her judgment and discretion in recommending to the field crew leader whether decontamination following a site visit is warranted.

Equipment and Supplies

A variety of sampling equipment is needed for surface water sample collection. This basic equipment and monitoring procedures are covered in other MPCA SOPs. The general equipment needed for monitoring conducted on resources infested with aquatic invasive species is listed below:

AIS-designated integrated sampler*	AIS designated Secchi disk/tube*
AIS-designated weighted bucket*	Invasive species inventory field reporting form
AIS-designated plankton tow net*	Permanent green marker
AIS-designated Kemmerer sampler*	Water spray tank, hose

*Purchasing and maintaining a set of specially-designated monitoring equipment to be used only on infested sites is highly recommended, and is a necessity when monitoring sites infested with zebra mussels and spiny water flea. If monitoring sites infested with a variety of invasives, even designated equipment will need to be thoroughly decontaminated between sites to prevent cross-contamination.

Procedures

This section details the steps necessary to properly prepare for sampling an infested site, decontaminate field equipment and field gear after sampling, and to prepare samples from sites infested with invasives for delivery to the analyzing certified laboratory.

Pre-trip requirements

Field planning

Prior to leaving for the field, the field crew leader must consult available resources or GIS coverages of known invasive-infested locations to determine if the sites they will be monitoring are located in invasive-infested areas. All field study sites known or suspected of being infested with one or more invasive species or agents should be visited at the end of the field day, or week, where practicable.

During reconnaissance field visits, field crews should note whether sites to be monitored support known or newly-observed populations of invasives. The field crew leader is responsible for reporting any new populations of invasives to the MDNR using that Department's reporting form (Appendix C).

Equipment preparation

Before heading into the field, confirm that all equipment necessary to complete decontamination procedures is present and in proper working condition. Ensure that the spray tank is full of water prior to leaving the Field Operations Center (MPCA, St. Paul) or other daily base location. Also, assure that an adequate supply of disinfectant or ethyl alcohol is in the field equipment and supply inventory.

Onshore requirements

Because field staff conduct sampling in a variety of habitats (e.g. lakes, rivers, streams, wetlands, and land surveys) while using numerous sampling gear types, the action steps below are divided into arriving and leaving the site, activities that involve walking or wading through habitats, those activities that involve boats, and those that involve sampling from bridges.

Site approach procedures

All field crews shall take care when approaching sites through vegetated areas to avoid contact with the seeds and pollen of invasive terrestrial plants whenever possible. Stream banks should be carefully examined to determine if invasives are present, and to avoid stepping on them, if they are.

Sampling requirements

If the lake, stream or wetland to be sampled is known to have invasive species or to be located in close proximity to an infested site, it should be sampled at the end of a trip. Where possible, a separate set of equipment should be purchased and maintained solely for use on infested resources. This is especially important for sites infested with spiny water flea or zebra mussels. Store dedicated equipment separately in vehicle, spread designated equipment out after use to encourage drying between sites.

Post-sampling requirements

Decontamination should begin upon returning to the field vehicle after accessing/sampling a stream, river, lake or wetland, and should be completed before leaving for the next site to give gear and equipment a chance to dry.

Decontamination protocols following wader sampling

1. Before leaving the river, stream or wetland site, the field crew members must rinse off all field equipment and personal protective equipment that has been in contact with aquatic habitats including raingear, waders and wading boots, using the pressure spray equipment described in Appendix B or a similar semi-portable pressure spray equipment.
2. Raingear, waders and wading boots are best decontaminated while being worn. Field crew members should cooperatively spray each other's' waders and wading boots, including lug soles. Decontamination spraying is considered complete when all visible debris, mud, invertebrates, pollen, and seeds are removed from waders, wading boots and field equipment. Typically, this will take one - five minutes to fully decontaminate individual waders, boots and field equipment.
3. Whenever possible, waders and wading boots should be hung up in the field vehicle to allow water to run off during transit between study sites; ideally, they will dry between sites.
4. Trays and field equipment should be turned or positioned to allow them to drain during transit to the next study side, store dedicated equipment separately in vehicle

Decontamination protocols following bridge stream sampling

1. Rinse samplers thoroughly with sprayer, and open and invert between sites to drain them and allow them to dry out.
2. Visually check sondes (including cables) and remove foreign matter, spray or rinse with water, and wipe dry.
3. Visually check transparency tubes for any foreign matter rinse or spray with water, and invert during transport to drain and dry as much as possible between sites, store dedicated equipment separately in vehicle

Decontamination protocols following boat sampling

The following website lists (by county) AIS decontamination facilities approved by the Minnesota DNR. Check the box at the bottom of the screen to limit the search to 'only businesses offering AIS

decontamination services'. Or, follow the steps below to minimize the risk or transporting AIS from one water body to the next.

https://webapps11.dnr.state.mn.us/aquatic_invasive_species_training/lake_service_provider_permits/public_website_list

1. Upon completion of sampling, return the boat to the dock/launch. Be sure to raise the motor prior to loading the boat onto the trailer. All switches should be shut off and if any water was taken on, the bilge pump should be run to empty the boat.
2. Once trailered, move vehicle/boat away from access.
3. Inspect the entire boat (boat, motor, and trailer) and remove any visible aquatic plant material or animals.
4. Spray boats with a pressure washer, if plant residue remains after initial cleaning.
5. Drain water from the boat and the motor after each lake. The boat plug should be left out as you're traveling to the next lake to ensure complete draining.
6. Rinse samplers thoroughly with sprayer, and open and invert between sites to drain them and allow them to dry out.
7. Visually check sondes (including cables) and remove foreign matter, spray or rinse with water, and wipe dry.
8. Spread sampling equipment and leave Kemmerer open to dry as much as possible between lakes, store dedicated equipment separately in the vehicle
9. If necessary, stop at a car wash and spray down the boat to minimize the possibility of transferring species between lakes.
10. Thoroughly spray boats down at the home base after each week's sampling trip, using a hot water pressure washer capable of maintaining 140 ^{o}F water temperature. Follow manufacturer's guidelines for safe operation of any hot water pressure washer.

Sample processing

Chlorophyll-a

Follow the MPCA's Lake Water Quality Sampling SOP to process samples. For lakes infested with aquatic invasives, chlorophyll-a sample filtration should never be done at any boat landing or in the parking lot of any boat landing. Additionally, remaining sample water should not be discarded in or near stormwater drains. Samples should be filtered within the lab at the home base, and filtrate should be discarded in a grassy area to allow for filtration and to keep it out of the sanitary or storm sewer system.

Sample labeling

All sample bottles containing water from resources infested with invasives must be labeled with the letters AIS preferably in green permanent marker. Samples labeled 'AIS' are processed by the lab in ways that will ensure they will not be discarded after analysis without treatment.

Literature Cited

MDNR. 2007. Invasive species operational handbook, a resource for Operational Order #113. MDNR, St. Paul, MN. For further information contact Luke Skinner, Supervisor Invasive Species Program, 651-259-5140 or e-mail luke.skinner@dnr.state.mn.us.

Appendix A

Prohibited Minnesota and federal invasive species

Designation of Infested Waters: Minnesota DNR

Appendix B

Recommended water sprayer

Model 14011 features a multi-purpose #30L low-pressure Gunjet with nylon housing, trigger lock, and an 18" brass lance. Maximum spray throw is 17' to 20'. Dimensions 31"L x 14"W x 14"H tanks – 15 gallons or 25-gallon, 18"W x 17"H x 36"L

Additional power option - 12V DC Cigarette Lighter Plug Adapter

Approximate cost (04/2008) $245.

Appendix C

Minnesota Department of Natural Resources' Invasive Species Field Reporting Form

INVASIVE SPECIES INVENTORY FIELD REPORT FORM

Observation Date: _____

Name: _____ Association: _____

Address: _____ City: _____ State: _____ Zip: _____

Phone: ( ) _____ Email: _____

Species Information – Name & Location

Common Name: _____ Scientific (if known): _____

Locality Name (lake or twnsp): _____ County: _____

Site address (if any): _____ City: _____ Zip: _____

Property Ownership (i.e., Private, county, state, federal, etc.): _____

Provide one or more of the following location methods below:

PLS: ¼ ¼ Sec _____ ¼ Sec _____ Sec _____ Twp _____ Range _____

GPS: X Coordinate (Lat./Easting): _____

Y Coordinate (Long./Northing): _____

Number of individuals observed (Check one): ☐< 20 ☐ 20 – 99 ☐ 100 – 999 ☐ < 1000

Distribution of infestation: ☐ occurs singly ☐ scattered pockets ☐ continuous/extensive

Size of infested area (acres): ☐ < 1 ☐ 1 – 5 ☐ 5 – 10 ☐ 10 – 50 ☐ > 50

Diagram: Show roads, nearest intersections, distances, compass direction and rough outline of invasive species population.

Verbal directions (if PLS/GPS information unavailable): _____

_____

Mail form to:

Minnesota Department of Natural Resources
Division of Ecological Resources
Box 25, 500 Lafayette Road
St. Paul, MN 55155-4025