

Reducing Accidental Introductions of Invasive Species State Agency Field Work Protocols

Invasive species often are spread accidentally by humans. The Washington State Invasive Species Council has developed protocols recommended for use by agency staff when working in the field to prevent the inadvertent spread of invasive species. These protocols represent the most basic steps agency staff should take both before and after working outside and should serve as a starting point for all agencies.

When working in the field, there are numerous ways that invasive species can be spread unintentionally. For example:

- Driving a car or truck to a field site and moving soil embedded with seeds or fragments of invasive plants in the vehicle's tires to another site. New infestations can begin miles away as the seeds and fragments drop off the tires and the undercarriage of the vehicle.
- Sampling streams and moving water or sediment infested with invasive plants, animals, or pathogens via your boots, nets, sampling equipment, or boats from one stream to another.
- Moving weed-infested gravel or dirt to a new site, carrying the weed seeds along with it, during restoration and construction activities. Before long, the seeds germinate, and the new site is infested.

Following are two sets of protocols, which should be conducted during and after all field visits. Considerations for construction projects also are provided. The first set of protocols pertains to field operations occurring on land; the other set is for work in the water. The major difference between them is the decontamination step in the aquatic protocol. This step becomes necessary to completely remove immature stages of invasive animals as well as pathogens such as VHS fish disease that are spread much more readily in water.

Individual agencies may decide to develop their own prevention protocols, tailored specifically to their operations. If those agency-specific protocols provide a level of prevention that goes above and beyond this one, then it is entirely appropriate for an agency to use its own.

One method for tailoring prevention protocols to an agency's operations is through the use of Hazard Analysis and Critical Control Points (HACCP) planning. This planning focuses attention on critical control points where invasive species can be prevented or removed and builds a step-by-step process to weigh risks for species spread against management benefits.

The key to ensuring implementation of these prevention measures is the development of policies and procedures to require compliance by field staff. Training and education of staff also will be needed. The Washington State Invasive Species Council will continue to work with and coordinate among the individual agencies to develop such policies and training materials.

Much credit for this work goes to the Department of Ecology's Environmental Assessment Program, which developed a comprehensive decontamination protocol for working in aquatic ecosystems. That protocol was expanded upon here to include terrestrial ecosystems. www.ecy.wa.gov/programs/eap/qa/docs/ECY_EAP_SOP_071PreventSpreadOfAIS-ModConcern_v1_0.pdf

Protocol for Working Outdoors on Land

1. Bring backups.

Use equipment that can be inspected and cleaned easily to both avoid spreading invasive species and reduce impacts to planned field schedules. If possible, bring extra sets of “backup” field equipment in case inspection and cleaning can’t be done in the field before arriving at a new site. Where feasible, dedicated gear and apparel used only in infested sites offers the best protection.

2. Minimize contact.

In general, conduct field activities to minimize contact between equipment and potential sources of invasive species, particularly mud and weeds. This can include the following:

- Avoid walking, driving, or mowing through weed patches when seeds are present.
- Stay on trails and avoid walking through areas of tall grass or brush.

Seek out basic information about where high-priority invasive species are known to occur, and pay particular attention to minimizing contact with them. Location information is found on the following Web sites:

- www.invasivespecies.wa.gov/documents/BAP_Maps.pdf
- www.ecy.wa.gov/programs/eap/lakes/aquaticplants/index.html#classa

3. Inspect and clean.

After working outdoors, inspect and clean all equipment and clothing that touched soil or vegetation.

- Remove any visible vertebrates, invertebrates, plants, plant fragments, seeds, algae, and dirt. If necessary, use a scrub brush and rinse with clean water either from the site or brought for that purpose. Continue this process until the equipment and apparel are clean. If on-site cleaning is not an option, clean equipment at a commercial car wash facility.
- For vehicles and other large equipment, pay particular attention to the undercarriage and treads of tracks and tires (see Figure 1). Brushing and using a high-pressure wash (with or without hot water) are effective options.

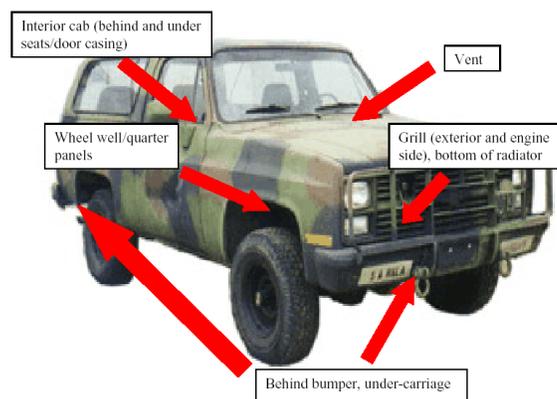


Figure 1. Recommended inspection sites for large equipment (USACE, 2006).

Protocol for Working in the Water

1. Bring backups.

Use equipment that can be inspected and cleaned easily to both avoid spreading invasive species and reduce impacts to planned field schedules. If possible, bring extra sets of “backup” field equipment in case decontamination can’t be done in the field before arriving at a new site. Where feasible, dedicated gear and apparel used only in infested sites offers the best protection.

2. Minimize contact.

Conduct field activities to minimize contact between equipment and potential sources of invasive species, particularly aquatic plants, sediment, and weeds. This may include the following:

- Sample from least to most invasive species-contaminated areas within the waterbody, for example, sample upstream to downstream or from areas of less weed growth to dense weed growth.
- Minimize wading and avoid running boats onto sediment. For example, use bank sampling poles instead of wading.
- Avoid getting plants, sediment, and fish inside boats or other sampling gear.
- Use a catch pan underneath dredges, etc., to keep potential invasive species off boat decks and out of bilges.

Seek out basic information about where high-priority invasive species are known to occur, and pay particular attention to minimizing contact with them. Location information is found on the following Web sites:

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3. Clean, Drain, Dry.

After working in the water, inspect and clean all equipment (see Figure 2 for boat example) and clothing that touched the water, dirt, and vegetation.

- **CLEAN** – Remove any visible vertebrates, invertebrates, plants, plant fragments, seeds, algae, and dirt. If necessary, use a scrub brush and rinse with clean water either from the site or brought for that purpose. Continue this process until the equipment is clean.
- **DRAIN** all water in bilges, samplers, and other equipment that could hold water before leaving the site.
- **DRY** – Fully wiped down all equipment until dry.

Before Leaving & Before Launching...
Inspect Everything!

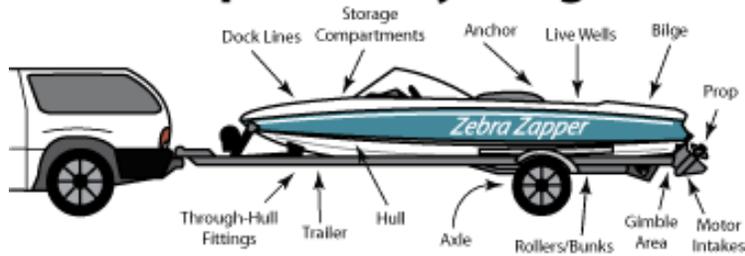


Figure 2. Recommended inspection sites for boats (www.100thmeridian.org).

4. If possible, decontaminate.

The treatment options listed in the table below use temperature (heat or cold) or chemicals to ensure that any species or pathogens that may have been missed during the initial treatment will be killed. **At this time, hot water and drying are the recommended treatments for large equipment such as boats and boat trailers.**

Decontamination treatments should take place where the procedure can be carried out effectively and safely. For all chemicals, follow the pesticide label and read the material safety and data sheet. Keep in mind that wash and rinse water must not drain to surface water, and all chemicals must be disposed of according to applicable regulations.

Decontamination Options for Aquatic Invasive Species

| Treatment | Concentration or Temperature | Exposure Time | Comments |
|--|-----------------------------------|--|---|
| Hot water wash or soak | 60° C (140° F) | 5 minutes for felt-soled boots and nets; 10 seconds for all other equipment | Ensure all parts of the equipment reach temperature for the full exposure time. |
| Cold/Freezing | -4° C | 4 hours minimum | Time starts after the equipment reaches -4° C. |
| Drying | low humidity, in sunlight is best | 48 hours on average (temperature and humidity dependent: see dry time calculator link below) | Time starts after the equipment is thoroughly dry. |
| Formula 409 All-Purpose Cleaner ¹ | 100 percent (full strength) | 10 minutes | Follow proper procedures for storage and handling. |
| Sparquat 256 | 3.1 percent or higher | 10 minutes | Follow proper procedures for storage and handling. |
| Quat 128 | 4.60 percent | 10 minutes | Follow proper procedures for storage and handling. |
| Hydrogen peroxide | 30,000 ppm (3 percent) | 15 minutes | Spray on until soaked, then keep damp for contact time (cover or place gear in a dry bag) |

(Decontamination protocols developed by the Washington Department of Ecology, Environmental Assessment Program)

¹ Must be antibacterial. (Make sure it has quaternary ammonia, otherwise it is ineffective.)

Specialized Considerations for Construction and Restoration Projects

- Avoid moving weed-infested gravel, rock, and other fill materials to relatively weed-free locations. Gravel and fill should come from weed-free sources. Inspect gravel pits and fill sources to identify weed-free sources.
- Identify existing noxious weeds along access roads and control them before equipment moves into relatively weed-free areas.
- Minimize the removal of roadside vegetation during construction, maintenance, and other ground-disturbing activities.
- Use only certified, weed-free straw and mulch for erosion control projects. Consider the use of weed-free fiber roll barriers or sediment logs.
- Keep construction sites that are in relatively weed-free areas closed to vehicles that are not involved with construction.
- Provide training to management and workers on the identification of noxious weeds, the importance of noxious weed control, and measures to minimize their spread.

Additional Information:

- Dry Time Calculator, www.100thmeridian.org/emersion.asp
- Stop Aquatic Hitchhikers, www.protectyourwaters.net
- Hazard Analysis and Critical Control Points planning, www.haccp-nrm.org
- U.S. Forest Service Noxious Weed Prevention, www.fs.fed.us/invasivespecies/documents/FS_WeedBMP_2001.pdf
- U.S. Bureau of Reclamation Equipment Inspection and Cleaning Manual, www.usbr.gov/mussels/prevention/docs/EquipmentInspectionandCleaningManual2010.pdf