



## Aquatic Surveys, Introductions, and Relocations: Best Management Practices to Prevent or Minimize Aquatic Invasive Species (AIS) Transfer

### Introduction

All permitted aquatic surveys, aquatic species introductions, and aquatic resource relocations are required to comply with regulations regarding possession, transport, and introduction of controlled exotic species into public waters. These regulations apply even to small fragments or seeds of these species, regardless of whether transfer is intentional or accidental. Implementation of Best Management Practices (BMPs) is necessary to prevent or minimize the risk of accidentally possessing or transferring controlled exotic species or pathogens.

Aquatic invasive species (AIS) cause or are likely to cause harm to our native ecosystems, both directly by competition or predation on native species and indirectly by altering the environment (e.g., reducing dissolved oxygen, shading). Many AIS cause significant economic harm in a number of ways—by damaging water transfer and hydroelectric infrastructure and increasing maintenance costs, clogging waterways and costing millions of dollars each year to manage, increasing evaporative water loss from reservoirs, and even lowering property values. These AIS can also impact human health and quality of life by helping to cause harmful algal blooms, impeding boater access, fouling beaches, and creating hazards for swimmers.

Because of these potential impacts, the legislature delegated to the Texas Parks and Wildlife Commission [TPW 66.007 & 66.0072] the authority to develop a list of Exotic Harmful or Potentially Harmful Fish, Shellfish, and Aquatic Plants that may not be possessed, transported, or introduced into public waters except as authorized by rule or permit issued by the department [31 TAC§57.112]. A complete list of these species, hereafter referred to as controlled AIS, can be found on the department website at [http://tpwd.texas.gov/huntwild/wild/species/exotic/prohibited\\_aquatic.phtml](http://tpwd.texas.gov/huntwild/wild/species/exotic/prohibited_aquatic.phtml). Possession or transfer of controlled AIS—live or dead—or the eggs, seeds, or fragments thereof, is punishable as a Class C Misdemeanor (with a fine up to \$500); repeat violations can be elevated.

Examples of controlled AIS include zebra mussels (*Dreissena polymorpha*) and their microscopic larvae, tilapias (*Oreochromis* spp.), hydrilla (*Hydrilla verticillata*), giant and common salvinia (*Salvinia molesta*, *S. minima*), and Eurasian watermilfoil (*Myriophyllum spicatum*). Some controlled AIS are fairly widespread in Texas, but their prevalence increases, rather than negates, the risk of accidental transfers that could cause infestations in new areas. More information about most of the controlled AIS that have been found in Texas, including

#### Abbreviations:

*AIS*: Aquatic Invasive Species

*TAC* –Texas Administrative Code; numbers before refer to title and numbers after to specific regulations

*TPW* –Texas Parks and Wildlife Code; numbers after TPW refer to specific statutes

maps of where they have been found, is available on [www.TexasInvasives.org](http://www.TexasInvasives.org) and a few especially problematic species are described below.

It is your responsibility to ensure that you and your team are not possessing, transporting, or introducing controlled AIS. However, it is not always necessary for you to know how to identify each species. By implementing a few general BMPs, you can achieve a high degree of confidence that you aren't accidentally doing so. In addition, implementing these BMPs will help to prevent transfer of non-prohibited, yet potentially harmful, AIS as well as harmful algae or pathogens that could negatively impact native species.

## General BMPs

- **DURING** surveys, introductions, and relocations, do not transfer water from one site to another unless specifically approved by the department; minimize water transfer whenever possible, using nets to transfer fish. For questions about treating hauling water, see the section on fish hauling units below.
- **AFTER** work in the water is complete:
- **CLEAN:** Remove mud, plant fragments, and other debris from all equipment before leaving the site—this includes nets, mesh bags, buckets, boot tread, waders, snorkel/SCUBA gear, boats, trailers, vehicles, and ANY other equipment used in or adjacent to the water. Before leaving the site, you should also rinse equipment that may harbor plant fragments (e.g., boot tread)—a gallon jug of water and a scrub brush or scraper can help to get things clean. If a carwash is available, the high pressure spray can help to clean boats, trailers, vehicles, and equipment. Otherwise, you should use a spray nozzle and water hose to finish cleaning equipment before use in another water body.
- **DRAIN:** Drain all water from boats, fish hauling units, buckets, or other receptacles at a location where the water will not drain into any water body.
- Soaking equipment with 10% bleach solution (i.e., 1 part household bleach to 9 parts water) for 10 minutes followed by a thorough rinse before drying can help to prevent transfer of zebra mussel larvae, golden algae, and fish pathogens such as viruses and should neutralize any hidden snails or plant fragments. Milder disinfectants (e.g., 1% Virkon Aquatic® for 10 minutes) or a 20-30 minute soak in very hot tap water (at least 110°F) can help decontaminate nets or equipment that bleach could damage.
- **DRY:** Allow all equipment to dry completely before use in another water body.

## **Special Rules and Recommendations**

### ***Boats***

Regulations require that all water be drained from vessels traveling to and from any public water body, except for travel between access points on the same water body within the same day [31 TAC §57.1001]. Texas law also specifically requires that all controlled aquatic plants be immediately removed from boats, trailers, and vehicles used to transport or launch them, and disposed lawfully [TPW 66.0071].

### ***Vehicles***

Vehicles used to launch boats or driven in the water or in mud adjacent to the water can easily harbor and transport AIS. It is especially important to check them thoroughly, remove all vegetation, rinse well with a spray nozzle, and allow them to dry completely before you visit another water body. Check the wheels, axle, bumper, and undercarriage carefully and be sure to rinse well everything well. Texas law specifically requires that all controlled aquatic plants be immediately removed from vehicles used to transport or launch boats and disposed lawfully.

### ***Fish Hauling Units***

For specific recommendations for decontaminating fish hauling units and treating hauling water to prevent transferring controlled AIS, golden alga, or fish pathogens, please see “A Biosecurity Manual for Inland Fisheries Division Hatcheries,” online at:

[http://tpwd.texas.gov/publications/pwdpubs/media/pwd\\_rp\\_t3200\\_1776.pdf](http://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_t3200_1776.pdf)

### ***Zebra Mussel Infested Water Bodies***

A current map and list of infested lakes can be found on the department website at:

<http://tpwd.texas.gov/huntwild/wild/species/exotic/zebramusselmap.phtml>. Zebra mussels are spread via both transfer of adults and microscopic larvae in water. When working at a site on a water body where zebra mussels or their larvae have been found, it is critical to ensure that no water is transferred and all equipment is allowed to dry thoroughly. You will also need to be very thorough in checking equipment for mud or debris that could harbor dislodged adults. For these projects, your methods should specify where decontamination will take place and identify and address any special equipment that could transfer zebra mussel larvae (e.g., bladder dam) and how it will be cleaned. **If zebra mussels are found at the site, you must report the finding to TPWD immediately by calling Monica McGarrity (512-552-3465), Brian Van Zee (254-495-8341), or your department contact. Native mussels with zebra mussels attached should never be relocated to another water body; if zebra mussels are attached, consult the department before proceeding.**

## ***Non-native Species and Aquatic Resource Relocations***

The aquatic resource relocation plan (ARRP) should stipulate that non-native species will not be relocated or specifically describe which species will (or will not be) relocated. In most cases, the department will not issue a permit for relocation of non-native species (i.e., not native at the watershed or sub-watershed level), regardless of whether or not they are designated as controlled AIS by TPWD regulations, because permitting their introduction would be inconsistent with department management goals. For example, suckermouth catfishes (genera *Hypostomus* and *Pterygoplichthys*) are highly invasive and their relocation will not be permitted, even though they are not controlled AIS. Asian Clams (*Corbicula fluminea*) are not native to Texas and should not be relocated. Rio Grande Cichlids (*Herichthys cyanoguttatum*) are native only to the lower Rio Grande drainage in Texas but may be found in other water bodies and can impact some native species; although they should not typically be relocated outside their native range, in some cases it may be permitted (e.g., park ponds or reservoirs). In some cases, relocation of Common Carp (*Cyprinus carpio*) may be permitted at the discretion of the Inland Fisheries district supervisor.

**Controlled fish AIS, such as tilapia, that are removed from a water body cannot be relocated and also must be promptly beheaded or gutted prior to disposal or transport for disposal.** A complete list of controlled AIS can be found on the department website at:

[http://tpwd.texas.gov/huntwild/wild/species/exotic/prohibited\\_aquatic.phtml](http://tpwd.texas.gov/huntwild/wild/species/exotic/prohibited_aquatic.phtml)

Grass Carp (*Ctenopharyngodon idella*) is a controlled AIS for which relocation could be approved, but only if the relocation site is in the same water body. If triploid (sterile) Grass Carp were stocked for nuisance aquatic vegetation control, they must be relocated within the same water body unless otherwise approved by the department. The department website provides a current list of all public water bodies where triploid grass carp have been stocked:

([http://www.tpwd.state.tx.us/landwater/water/environconcerns/nuisance\\_plants/public\\_tgc\\_permits.phtml](http://www.tpwd.state.tx.us/landwater/water/environconcerns/nuisance_plants/public_tgc_permits.phtml)). If grass carp are encountered in other water bodies not on this list, they must be beheaded or gutted and disposed unless otherwise directed by the Inland Fisheries district supervisor.

## ***Disposal of Fish (Non-native or Native)***

Dead animals, including fish, are classified as municipal solid waste [30 TAC §330.3]. Although they are considered special waste [30 TAC §330.171], no special authorization is required for disposal at any Type I or Type IAE landfill. For government roadway maintenance projects by TxDOT or county or municipal agencies, fish may be disposed by burial on the highway right away as long as the disposal does not cause a nuisance or endanger public health or the environment and the carcasses are covered with at least two feet of soil [30 TAC §330.13; TCEQ communication]. Other individuals or entities should dispose of fish in a landfill.

## Some Controlled AIS to Know – Easily Transported by Accident

### ***Giant Salvinia (Salvinia molesta)***

[http://www.texasinvasives.org/plant\\_database/detail.php?symbol=SAMO5](http://www.texasinvasives.org/plant_database/detail.php?symbol=SAMO5)

### ***Common Salvinia (S. minima)***

[http://www.texasinvasives.org/plant\\_database/detail.php?symbol=SAMI7](http://www.texasinvasives.org/plant_database/detail.php?symbol=SAMI7)

### ***Hydrilla (Hydrilla verticillata)***

[http://www.texasinvasives.org/plant\\_database/detail.php?symbol=HYVE3](http://www.texasinvasives.org/plant_database/detail.php?symbol=HYVE3)

<http://aquaplant.tamu.edu/plant-identification/alphabetical-index/hydrilla/>

<http://plants.ifas.ufl.edu/node/183>

### ***Eurasian Watermilfoil (Myriophyllum spicatum)***

[http://www.texasinvasives.org/plant\\_database/detail.php?symbol=MYS2](http://www.texasinvasives.org/plant_database/detail.php?symbol=MYS2)

<http://aquaplant.tamu.edu/plant-identification/alphabetical-index/eurasian-watermilfoil/>

<http://plants.ifas.ufl.edu/node/278>

### ***Alligatorweed (Alternanthera philoxeroides)***

[http://www.texasinvasives.org/plant\\_database/detail.php?symbol=ALPH](http://www.texasinvasives.org/plant_database/detail.php?symbol=ALPH)

<http://aquaplant.tamu.edu/plant-identification/alphabetical-index/alligator-weed/>

### ***Torpedograss (Panicum repens)***

<http://aquaplant.tamu.edu/plant-identification/alphabetical-index/torpedograss/>

<http://plants.ifas.ufl.edu/node/308>

### ***Zebra mussels (Dreissena polymorpha)***

[http://texasinvasives.org/animal\\_database/detail.php?symbol=10](http://texasinvasives.org/animal_database/detail.php?symbol=10)

### ***Island applesnail (Pomacea insularum)***

[http://texasinvasives.org/animal\\_database/detail.php?symbol=15](http://texasinvasives.org/animal_database/detail.php?symbol=15)

A complete list of controlled AIS can be found on the department website at:

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To learn more about other AIS, how to identify them, and where they've been found in Texas, visit: [http://www.texasinvasives.org/invasives\\_database/](http://www.texasinvasives.org/invasives_database/)

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