

Issue 1

Texas Parks and Wildlife Cannot Minimize Risk From Harmful Exotic Aquatic Plants Under Its Current Regulatory Approach.

Summary

Key Recommendations

- ◆ Require the Texas Parks and Wildlife Department to create a list of aquatic plants that may be imported and possessed within Texas without a permit.
- ◆ Direct the Department to provide greater information to the public on the harm caused by releasing exotic species.

Key Findings

- ◆ The Texas Parks and Wildlife Department regulates the importation, possession, sale, and introduction of harmful exotic aquatic plants into Texas waters.
- ◆ The importation of exotic aquatic plants poses unknown future risks to the Texas environment that cannot be prevented by TPWD's current efforts.
- ◆ Other states and other nations have implemented white list processes to allow only the importation of exotic species that are proven to not harm the environment.

Conclusion

The introduction of non-native species by humans has dramatically altered the landscape of Texas. While most of these new species brought positive changes to Texas' economy, some exotic species created extreme negative changes. The ability of some exotic species to rapidly reproduce, especially in aquatic environments, gives rise to the term, invasive species. Because the aquatic environment is easily affected by exotic species and in an effort to prevent infestations, the Legislature has granted the Texas Parks and Wildlife Department (TPWD) regulatory authority over harmful exotic fish, aquatic organisms, and plants. The Sunset review of the Department's efforts to regulate harmful exotic species examined the effectiveness of its current approach in creating a black list of species that cannot be imported or possessed in the state without a permit. Under this approach, the Department currently allows the free importation of all species not currently on the black list.

The Sunset review focused on the Department's efforts to control invasive aquatic plants and found that Texas' semi-tropical, aquatic environment is especially prone to negative effects by invasive plants which can crowd out native species, destroy habitats, deplete oxygen from water, and spread so rapidly as to render waterways unusable to boat traffic. Once established in the state's rivers and lakes, aquatic invasive plants are expensive to eradicate or control. In today's global economy, however, many new plant species can be imported even though no information is available about the potential harm that they could cause. Because new exotic plants can quickly invade rivers and lakes before the Department can research and add the species to the black list, the review concluded that the current black list approach is not adequate to prevent future infestations of previously unknown plants. Examining the experience of other states and nations, staff recommends extending the Department's authority to establish a list of approved plants and to require a permit for the importation of species not on the approved list.

Support

The introduction of exotic species has dramatically changed Texas' environment.

- ◆ Texas' environment has been dramatically changed by the introduction of exotic species, both beneficial and harmful. Many plants and animals that are now considered part of Texas' natural and agricultural environments are actually non-native species. For a look at the first introduction of beneficial exotic species to Texas, see the textbox, *The Columbian Exchange*.

The Columbian Exchange

The widespread transfer of plants and animals between the Eastern and Western hemispheres following Columbus' discovery of the New World in 1492 is known as the Columbian Exchange. Texas' agricultural landscape was particularly affected by exotic plants and animals brought by European settlers that are now standard features of the state's agriculture. For example, before the Columbian Exchange, there were no cattle, chickens, cotton, horses, onions, oranges, rice, sheep, soybeans, sugarcane, watermelons, or wheat in Texas.

Along with beneficial exotic species, people have also introduced many harmful species. By their nature, exotic species can be dangerous to their new environment because natural controls, such as predators and habitat constraints, are often not present. The capacity of exotic species to rapidly reproduce and supplant native species gives rise to their definition as invasive species. In 1999, the U.S. President thus defined invasive species in Executive Order 13112 as "alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health."¹

While estimates of the Texas cost of invasive species are difficult to quantify, their overall economic impact in the United States is estimated to be \$35 billion per year including losses and control costs associated with invasives in agriculture and rangeland.² The primary ways that invasive species are spread through the natural environment are detailed in the textbox, *Paths of Introduction*.

In Texas waters, exotic plants can crowd out native species, kill fish by depleting oxygen, and render waterways impassable to boats.

- ◆ Aquatic environments are prone to negative effects by exotic species, especially plant species. Because of its temperate semi-tropical climate, Texas' rivers and lakes are prone to the negative consequences, as harmful, invasive plants can crowd out native species, destroy natural habitats, kill fish and wildlife by removing oxygen from water, and render waterways unusable to boat traffic.³ In particular, Texas' lakes are at risk from invasive species as most of the state's lakes are man-made and recent evidence shows that man-made reservoirs are more prone to invasives than natural lakes.⁴

Paths of Introduction

Invasive species can be introduced into the natural environment by various pathways including deliberate introduction, accidental release, and small-scale releases.

Deliberate Introduction – Many harmful exotics have been deliberately introduced, in some cases, as a means of controlling other invasive species. For example, in the 1930s, federal conservation officials planted water milfoil in Lake Austin and Lake Travis as forage for ducks and to prevent soil erosion.⁵ While milfoil did not attract ducks, the fast-growing, stringy plants clogged the lakes, negatively affecting fishing, boating, and swimming. Nutrias, a large hairy rodent, were then imported to eat the milfoil.⁶ Although Nutria did not prove to be a good control for milfoil, they also proved to not have any natural predators allowing their population to explode. Nutrias ultimately damaged the aquatic habitat by killing trees on river banks and leaving some areas as denuded mudflats.

Accidental Release – Although not an aquatic species, a commonly known example of accidental release is the red imported fire ant (*Solenopsis invicta*). A native of central South America, fire ants first arrived in Mobile, Alabama around 1930 in soil used for Brazilian cargo ship ballast.⁷ These aggressive ants spread widely and are now a common pest in Texas. Zebra mussels were similarly introduced into the United States in the ballast water of ocean-going ships traversing the St. Lawrence Seaway and were first detected in the Great Lakes in 1988. Zebra mussels rapidly spread and disrupt ecosystems, kill native species, and damage harbors, boats, power plants, and water treatment plants. The U.S. Coast Guard estimates that economic losses and control efforts cost about \$5 billion per year.⁸ Recreational watercraft also play a role in spreading exotics as species can travel from one water body to another by “hitching a ride” on boats that have not been properly cleaned of organic material.⁹

Small-scale Introductions – Invasive species are also deliberately released on a small scale, such as the release of bait fish or the dumping of unwanted aquarium plants into a waterway. For example, hydrilla, a plant from Asia now considered to be one of the world’s worst aquatic weeds, was a popular aquarium plant in the 1970s. Unlike most native aquatic plants, hydrilla forms dense mats of vegetation on a lake’s surface. In 1981, hydrilla covered about 40 percent of Lake Conroe, some 8,400 acres. A concerted effort to eliminate the plant by releasing grass carp reduced the infestation to three acres in 2002. However, the grass carp also eliminated native aquatic plants, and hydrilla rebounded to cover about 868 acres by 2005.¹⁰ Hydrilla is also a problem in Lake Austin and other Texas lakes.

As Texas’ ecosystems have developed natural checks and balances, invasive plants can eliminate the diversity that creates healthy habitats.¹¹ By their nature, aquatic invasive plants can rapidly spread. For example, giant salvinia is capable of doubling its population in as little as two to eight days.¹² The table on the following page, *Common Harmful Aquatic Invasive Plants in Texas*, lists some of the non-indigenous invasive plant species found in Texas waters.

The Texas Parks and Wildlife Department regulates the importation, possession, sale, and introduction of harmful exotic aquatic plants into Texas waters.

- ◆ In 1975, the Legislature first granted TPWD broad regulatory authority over potentially harmful aquatic life, including fish, aquatic organisms, and plants. Under this authority, no person may import, possess, sell, or introduce exotic fish, organisms, or plants into Texas waters without a permit issued by TPWD.¹³ The statute requires TPWD to publish a list of species for which a permit is required, referred to as a ‘black list.’ In practice, TPWD allows the importation, possession, sale, and release of everything not on the black list. The Department has used its

Aquatic invasive plants can rapidly spread, sometimes doubling in population within a week.


rulemaking authority under this statute to limit the issuance of permits only to aquaculturists, wastewater plant operators, researchers, or public aquariums, and TPWD issues about 145 permits per year.

Common Harmful Aquatic Invasive Plants in Texas

Species	Description
Water Hyacinth	Water hyacinth is a free floating aquatic plant that invades lakes, ponds, rivers, marshes, and other wetland habitats. It can quickly form dense floating mats of vegetation and can double in size in two weeks. These dense mats reduce light available for submerged plants and fish, and deplete oxygen levels. Water hyacinth is native to South America and was first introduced as an ornamental plant into the United States in 1884.
Hydrilla	Hydrilla is a submerged, rooted aquatic plant that can grow in water up to depths of 20 feet. Hydrilla forms dense mats at the surface of the water that can restrict native vegetation, irrigation practices, recreation, hydroelectric production, and water flow. Hydrilla was first introduced into North America as an aquarium plant in the 1950s.
Giant Salvinia (<i>Salvinia molesta</i>)	Giant salvinia is a free-floating aquatic fern, native to southeastern Brazil. Giant salvinia grows extremely quickly, and can double in population size every few days, resulting in ponds, reservoirs, and lakes covered by thick, floating mats. The plant’s growth blocks sunlight needed by other aquatic plants and algae to oxygenate the water.

The agency currently charges \$250 to apply for an exotic species permit and \$25 for annual renewals. First time violations of the statute are a Class B misdemeanor, and violators who have committed the offense three or more times may receive a felony punishment. In the past three fiscal years, TPWD game wardens issued seven citations for violations of this statute. To date, five of these cases resulted in convictions and two of the cases are pending.

Because invasive plants spread easily, state law specifically requires boat operators to clean boats and trailers of aquatic plants when leaving public waters.¹⁴ The law also prohibits both deliberate and accidental introduction of any type of exotic aquatic life into Texas’ public waters without a TPWD permit. Violations of this statute are a Class C misdemeanor. In the past three fiscal years, TPWD game wardens have not issued any citations for violations of this statute.



The cost to control invasive aquatic plants is remarkably high – TPWD is currently spending \$120,000 per year just to clear boat lanes in Caddo Lake from giant salvinia.

- ◆ TPWD also has legislative direction to control noxious aquatic vegetation. The Legislature, in 2007, directed TPWD to spend \$120,000 per year to clear boat lanes in Caddo Lake that have become unnavigatable due to infestations of giant salvinia and other aquatic invasive species. To continue to combat similar infestations on public waters, TPWD has requested \$1.25 million per year in its 2010-2011 Legislative Appropriations Request. The requested funds are for control purposes, such as spraying herbicides and cutting plants in public waters. Political subdivisions and private individuals also spend considerable funds and energy fighting invasive species. The cost to completely eradicate an invasive species can be very high. The State of Indiana has put the cost of eradicating hydrilla at \$2,290 per acre.¹⁵

The Legislature has also required TPWD to develop and adopt the State Aquatic Vegetation Management Plan (Management Plan).¹⁶ An important element of the Management Plan is the requirement to ensure that the use of aquatic herbicides complies with uses approved by the U.S. Environmental Protection Agency. Because most of Texas' rivers and reservoirs are ultimately used as municipal water supplies, the use of aquatic herbicides to control invasive species pose a potential risk to public health. TPWD's current Management Plan emphasizes integrated pest management techniques using herbicides in conjunction with biological controls (such as the introduction of sterile carp to eat hydrilla) and mechanical strategies (such as the clearing of boat lanes with mechanical harvesters).

The importation of exotic aquatic plants poses unknown future risks to the Texas environment that cannot be prevented by TPWD's current efforts.

- ◆ While TPWD and landowners battle the current set of invasive plants in Texas, TPWD's black list approach allows importers to bring in new species with unknown dangers that may cause additional problems. TPWD biologists speak of the need for further regulation of species importation as based upon an inarguable scientific position: non-native species can be introduced into Texas that can cause great damage. Because the global economy permits their easy distribution, species that are unknown in Texas may be imported before their harm is completely understood. The assessment of the potential harm of exotics comes after the introduction of the species, and it may take several years to fully realize the impact of the species on the environment.¹⁷
- ◆ Because preventing the introduction and spread of non-native species is cheaper than controlling established invaders, TPWD's current black list approach is not a cost-effective approach to aquatic invasive plants.¹⁸ By the time that an aquatic plant species has been introduced into Texas' environment and been shown to have negative consequences, efforts to control or eradicate that species will be costly.

As new infestations may take place during the time it takes to fully understand the harm caused by a new species, the invasive plants may become so firmly rooted that it is too late to eradicate it. For example, the relatively pristine upper San Marcos River was recently invaded by the previously unknown, invasive water trumpet, cryptocoryne. Within months of its first sighting, the rapid spread of cryptocoryne threatened two endangered species and required TPWD to dredge two miles of river bed, an expensive undertaking.


- ◆ The current black list system also has problems with workability. The list of banned aquatic plant species includes some 20 aquatic plants. The process to add species to the list is cumbersome and time consuming. Adding to the list requires a full Commission rulemaking proceeding and takes a minimum of six months. During this time, the exotic plant


By the time an aquatic plant species has been introduced into Texas' environment and been shown to cause harm, efforts to control or eradicate that species will be costly.

species can gain a foothold in Texas' environment that makes eradication difficult and costly.

Other states and other nations have implemented white list processes to allow only the importation of exotic species that are proven to not harm the environment.

- ◆ As preventing future infestations is a far cheaper solution than fighting invasive species after introduction, other states have created white lists of aquatic species that are permitted to be imported and required permits for the importation of species not on the list. Persons wishing to obtain a permit or add a species to the white list are required to prove that species is not harmful before their large-scale importation.



White lists that only allow the importation of non-harmful plants are far more cost-effective than fighting invasive species after introduction.

For example, Oregon, in 1996, adopted Wildlife Integrity Rules (WIR) that protect native wildlife from the potential harms of non-native species. The WIR classify exotic species into one of three categories based on their risk to native wildlife: prohibited, controlled, and non-controlled. As of 2002, Oregon's scientific review panel had assessed the risk of more than 16,000 non-native species.¹⁹ Hawaii and Minnesota have also implemented strong white list legislation, while Florida, Georgia, Idaho, and Kentucky have implemented partial white list approaches to invasive species.²⁰

- ◆ The nations of Israel, South Africa, Australia, and New Zealand have each established a form of the white list system, banning imports of species that are not on the approved list.^{21,22} For example, Australia, in 1997, instituted a white list for both plant and animal imports. The nation found that the change in regulation was successful when prefaced by awareness of the risks of importing new agricultural pests and diseases.²³

Recommendations

Change in Statute

1.1 **Require the Texas Parks and Wildlife Department to create a list of aquatic plants that may be imported and possessed within Texas without a permit.**

This recommendation would establish a process where TPWD would evaluate the potential harm represented by the importation of previously unknown aquatic plants into Texas before those plants can be brought in and potentially cause harm by being released into the environment. Building upon TPWD's current authority over harmful aquatic species, the agency would establish a list of approved plants that are allowed to be imported and propagated in Texas. Exotic plant species not appearing on the white list would require a permit before being imported and TPWD should use its current process in permitting individuals to possess species on the black list for this purpose. This white list for aquatic plants would supplant the current requirement that TPWD publish a black list of aquatic plants, but the statutory requirement to publish a list of aquatic fish and other organisms for which a permit is required would remain. TPWD's current rules provide exceptions to importation and possession of banned species – primarily for public aquariums and zoos, and scientific or medical research. Clear statutory authority for these exceptions would ensure their continuance.

In compiling the list of approved aquatic plants, TPWD should use a risk assessment model to determine the potential harm of the species to the aquatic environment. The process should include peer review, published scientific research, findings from other regulatory agencies, and scientific analysis from third-party labs. Exotic plants that are determined to be already widespread in Texas and not causing economic, environmental, or health problems would be automatically approved on the white list. TPWD should strive to ensure that regulations are as permissive as possible without allowing the importation of plants that pose environmental, economic, or health problems.

TPWD would create a process by which persons may request that previously unknown plants be added to the approved list following the same risk assessment model as used in establishing the original list. While final approval should rest with the Parks and Wildlife Commission, the Commission should delegate authority to the Executive Director to create a fast-track approval process to lessen the burdens upon affected industries. TPWD should strive to speed the processing of requests by maximizing the use of available scientific data so as to reduce the information required from requestors.

Management Action

1.2 Direct the Department to provide greater information to the public on the harm caused by releasing exotic species.

To aid the voluntary compliance of the public with exotic species issues, TPWD should expand its educational efforts to inform the public about the harm that can be caused by accidental and small-scale intentional releases of aquatic species into the environment. Although these releases are prohibited by current law, they are difficult to police as the agency cannot patrol every stretch of water. An educational program that provides information on proper disposal of unwanted aquatic species, distributed through the agency’s normal avenues of information dissemination as well as through pet and aquarium stores, could cost-effectively reduce an important route of introduction.

Fiscal Implication

While these recommendations would ultimately serve to reduce the future cost of eradicating and controlling harmful invasive plants, in the short term they would result in a fiscal impact to the State. TPWD will have a one-time cost of an estimated \$50,000 to hire a consultant to help compile the list of approved aquatic plants. The Legislature could consider funding this cost from the Game, Fish and Water Safety Account (Fund 009) as it will benefit Texas’ anglers and boaters. Alternatively, the Legislature could consider using the General Revenue Fund for all or some costs, since this recommendation also generally protects natural resources. The Department’s costs to manage and enforce the aquatic plant white list in future years, and approve permits to import or possess plants not on the list, should not be an additional cost over current expenditures for managing and enforcing its black list for aquatic plants.

<i>Fiscal Year</i>	<i>Cost to the Game, Fish, and Water Safety Fund (Fund 009)</i>	<i>Change in FTEs From FY 2009</i>
2010	\$50,000	0
2011	\$0	0
2012	\$0	0
2013	\$0	0
2014	\$0	0

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 - 2 The Nature Conservancy, *The Nature Conservancy, Suffolk County Parks Partner to Remove "Invasive" Plants From Natural Areas*, <http://www.nature.org/wherewework/northamerica/states/newyork/press/press3701.html>. Accessed: September 23, 2008.
 - 3 Texas Parks and Wildlife, "Nuisance Aquatic Vegetation," http://www.tpwd.state.tx.us/landwater/water/enviroconcerns/nuisance_plants/. Accessed: October 31, 2008.
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 - 7 U.S. Department of Agriculture, Animal and Plant Health Inspection Service, *Program Aid 1665*.
 - 8 U.S. Department of Transportation, "Measures Announced to Prevent Environmental Damage From Harmful Aquatic Plants and Animals," <http://www.dot.gov/affairs/1999/dot7299.htm>. Accessed: September 24, 2008.
 - 9 Texas Parks and Wildlife, "Protect Our Waters, Stop Aquatic Hitchhikers," http://www.tpwd.state.tx.us/fishboat/boat/protect_water/. Accessed: October 31, 2008.
 - 10 "Agencies preparing to Fight Hydrilla in Lake Conroe," Texas Parks and Wildlife Department, September 19, 2005, (news release).
 - 11 Christy Goodman, "Nature's Invaders on Display," *Washington Post*, September 14, 2008.
 - 12 Union of Concerned Scientists, "Invasive Species of Texas," 1999, <http://www.brit.org/research/native-and-non-native-species-new-for-texas-conservation-concerns/non-native-species-in-texas/>. Accessed: September 25, 2008.
 - 13 Texas Parks and Wildlife Code, sec. 66.007.
 - 14 Texas Parks and Wildlife Code, sec. 66.0071.
 - 15 Doug Keller, Aquatic Invasive Species Coordinator, Indiana Department of Natural Resources, "An Ounce of Prevention . . . Indiana's Aquatic Invasive Species Strategy," <http://www.glc.org/ans/documents/DKellerPresentation-IndianaAISStrategy.pdf>. Accessed: October 31, 2008.
 - 16 Texas Parks and Wildlife Code, sec. 11.082.
 - 17 U.S. Department of the Interior, U.S. Fish and Wildlife Service, "Injurious Wildlife Species; Black Carp (*Mylopharyngodon piceus*)" *Federal Register*: October 18, 2007 (Volume 72, Number 201), Rules and Regulations, Page 59020.
 - 18 *Ibid.*
 - 19 Larry Cooper, Nonnative Species Program Coordinator, Oregon Department of Fish and Wildlife, "Oregon's Invasive Species Screening Programs," *Proceedings of the Invasive Species Screening Workshop*, January 8-9, 2002, Las Vegas Nevada, <http://www.fws.gov/answest/screening.pdf>. Accessed: October 31, 2008.
 - 20 Robert N. Fabian, and Marc L. Miller, *Harmful Invasive Species: Legal Responses*, (Washington, D.C.: Environmental Law Institute, 2004), pp. 154-155.
 - 21 Dr. Simon C. Nemtzov, Israel Nature and Parks Authority, "Managing the import of vertebrates to Israel to Prevent invasive species," <http://www.issg.org/Animal%20Imports%20Webpage/Presentations/Reference/NemtzovIsraelpaper.pdf>. Accessed: October 31, 2008.
 - 22 J. L. Hudson, "Help Stop the White List" <http://www.jlhudsonseeds.net/WhiteList.htm>. Accessed: October 31, 2008.
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Responses to Issue 1

Recommendation 1.1

Require the Texas Parks and Wildlife Department to create a list of aquatic plants that may be imported and possessed within Texas without a permit.

Agency Response to 1.1

The Department concurs with this recommendation and believes that a white list would enable TPWD to more effectively prevent the introduction of invasive, non-native species before they get established. (Peter Holt, Chairman – Texas Parks and Wildlife Commission and Carter Smith, Executive Director – Texas Parks and Wildlife Department)

For 1.1

Myron J. Hess, Manager of Texas Water Programs/Counsel – National Wildlife Federation, Austin

Andy Jones, Director – The Conservation Fund, Austin

Evelyn Merz, Conservation Chair – Lone Star Chapter of the Sierra Club, Houston

Captain Thomas B. Rodino, USCG (Retired), Bayview

Brian Steward – Lone Star Bowhunters Association, Austin

Against 1.1

None received.

Recommendation 1.2

Direct the Department to provide greater information to the public on the harm caused by releasing exotic species.

Agency Response to 1.2

The Department concurs with this recommendation. (Peter Holt, Chairman – Texas Parks and Wildlife Commission and Carter Smith, Executive Director – Texas Parks and Wildlife Department)

For 1.2

Myron J. Hess, Manager of Texas Water Programs/Counsel – National Wildlife Federation, Austin

Andy Jones, Director – The Conservation Fund, Austin

Evelyn Merz, Conservation Chair – Lone Star Chapter of the Sierra Club, Houston

For 1.2 (continued)

Captain Thomas B. Rodino, USCG (Retired), Bayview

Brian Steward – Lone Star Bowhunters Association, Austin

Against 1.2

None received.

Modifications

1. Give TPWD regulatory authority over invasive terrestrial species. (Tim Cook, State Conservation Director – Texas Bass Federation Nation, McQueeny)
2. Fund TPWD to control invasive terrestrial plants in state parks. (Evelyn Merz, Conservation Chair – Lone Star Chapter of the Sierra Club, Houston)

Commission Decision

Adopted Recommendations 1.1 and 1.2.

Legislative Action

House Bill 3391 requires Texas Parks and Wildlife Department (TPWD) to evaluate the potential harm represented by the importation of previously unknown aquatic plants into Texas, and to establish a list of approved plants allowed to be imported and propagated. Exotic plant species not appearing on the approved list will require a permit before being imported. The bill requires TPWD to use a risk-assessment model in determining the potential harm of an exotic species to the aquatic environment. The process must include peer review, published scientific research, findings from other regulatory agencies, or scientific analysis from third-party labs. (Recommendation 1.1)