The Existing U.S. Legal Regime to Prevent the Hull Transport of Aquatic Invasive Species

A White Paper Prepared by

Stephanie Showalter, Director

Jason Savarese, Research Counsel

September 2004
(Updated August 2005)

This white paper was commissioned by the California Sea Grant Extension Program to support the Program's ongoing aquatic invasive species research, education, and outreach activities. The following information is intended as advisory research only and does not constitute legal representation of California Sea Grant or any of its constituents by the National Sea Grant Law Center. It represents our interpretation of the relevant laws.

Introduction

The predominant vector for the human transport of nonindigenous species in marine environments has been shipping. While ballast water receives the most attention, hull fouling is also a significant vector. "Hull fouling may be the most underestimated pathway for nonnative introductions."[1] For example, 90 percent of the 343 marine alien species in Hawaii are thought to have arrived through hull fouling.[2] The results of a study published in 2003 revealed that 36 percent of the nonnative coastal marine species established in continental North America could be attributed to hull fouling alone.[3] Ballast water, by itself, only accounted for 20 percent.[4]

Fouling refers to the process by which sessile plants and invertebrates settle on submerged artificial surfaces like boat hulls, floating docks, underwater cables, and oil platforms. To combat vessel fouling, which reduces vessel speed, increases fuel consumption, and decreases maneuverability, antifouling paints were developed. Antifouling paints contain biocidal agents to prevent larvae from settling on the boat hulls. The use of these paints has significantly reduced the risk of introductions via fouling organisms. In the 1980s, tributyltin (TBT)-based antifouling paints became widely used. TBT is an endocrine-disrupting chemical which has been linked to masculinization of certain female gastropods and deformities in oyster shells and certain snail species.[5] Environmental concerns led to a U.S. ban of TBT in 1988 and a global phase-out of antifouling systems that utilize TBT and other organotins is underway.[6] The TBT ban will likely increase the risk of nonindigenous species introduction via hull fouling.

The U.S. legal regime to control hull fouling and the transport of invasive species via ships' hulls is extremely sparse. Hull fouling is mentioned in the Coast Guard's new mandatory ballast water program and several states have adopted laws to address the problem, but there "is little focused management to control fouling organisms."[7] The following is a review of the existing and pending legal regime in the U.S. regarding the prevention of hull transport of aquatic invasive species. This paper also contains information on hull fouling activities in Canada and Mexico, as U.S. aquatic invasive species (AIS) efforts often involve collaboration with our neighbors to the north and south. Finally, Australia and New Zealand are pioneering the management of hull fouling as an invasive species pathway. Because their policies may serve as models for future U.S. efforts, these two regimes are detailed as well.

Federal Laws and Guidelines

On the federal level, the Coast Guard is the primary agency responsible for addressing hull fouling. This authority is not derived from any specific federal statute, but rather a logical

---

[1] State of Hawaii AIS Management Plan 3-22 (Sept. 2003).
[2] L.S. Godwin, Hull Fouling as a Pathway For Marine Invasions to Hawaii: Analysis of Vectors and Developing Management Strategies, *Proceedings of the Third International Conference on Marine Bioinvasions*, La Jolla, California, March 16-19, 2003, 45 (2003).
[3] Gregory Ruiz and James T. Carlton, Invasive Species: Vectors and Management Strategies 170 (2003).
[4] *Id.*
[5] Environmental Protection Agency, Ambient Aquatic Life Water Quality Criteria for Tributyltin (TBT) – Final 3-5 (Dec. 2003).
[6] The International Convention on the Control of Harmful Antifouling Systems on Ships was adopted by the International Maritime Organization on October 5, 2001. When it enters into force, the convention will prohibit the use of organotins in antifouling paints.
[7] James Carlton, Introduced Species in U.S. Coastal Waters: Environmental Impacts and Management Priorities 17 (2001).

outgrowth of its existing responsibilities for ballast water management and vessel inspections. While the Coast Guard has always been able to address hull fouling through annual vessel inspections, the new federal mandatory ballast water program directs vessel owners to remove fouling organisms.

> Masters, owners, operators, or persons-in-charge of all vessels equipped with ballast water tanks that operate in the waters of the U.S. must
>
> * * *
>
> (5) Rinse anchors and anchor chains when you retrieve the anchor to remove organisms and sediments at their place of origin.
>
> (6) Remove fouling organisms from hull, piping, and tanks on a regular basis and dispose of any removed substances in accordance with local, State and Federal regulations.[8]

Violations are punishable by a civil penalty not to exceed $27,500, and "each day of a continuing violation constitutes a separate violation."[9] Anyone who knowingly violates the ballast water regulations is guilty of a class C felony,[10] punishable by up to twelve years in prison.[11]

Hull cleaning and disposal guidelines have yet to be developed and issued by the Coast Guard. The Coast Guard has, however, developed *Voluntary Guidelines on Recreational Activities to Control the Spread of Zebra Mussels and Other Aquatic Nuisance Species*, which it promotes through boater safety courses and AIS education campaigns.[12] The guidelines encourage boaters to inspect their boats, trailers, and other equipment such as anchors and remove any visible plants, animals, or mud. Boaters should also wash and dry boats and trailers once they have returned home to kill species that were not visible at the boat launch. Before transporting a boat to other waters, boat owners should

(1) Rinse [their] boat and boating equipment with hot (greater than 40 °C or 104 °F) tap water;
(2) Spray [their] boat and trailer with high-pressure water; [or]
(3) Dry [their] boat and equipment for at least 5 days.

Similar suggestions are offered for seaplanes and personal watercraft.

State Programs

All states have programs to address the introduction of nonindigenous species. In most states, it is illegal to release non-native plants and animals into the natural environment. Very few states, however, have laws that specifically address hull fouling. It is important to note that

---

[8] 33 CODE OF FEDERAL REGULATIONS § 151.2035(a)(5)-(6) (2005).
[9] *Id.* § 151.2007(a).
[10] *Id.* § 151.2007(b).
[11] 18 UNITED STATES CODE § 3581 (2005).
[12] 65 FEDERAL REGISTER 82447 (Dec. 28, 2000).

many states without hull fouling management programs address hull fouling through boater awareness and educational campaigns that are not mandated by statute. This section discusses only those state programs in which there is a legal regime for hull fouling, as opposed to a generic management scheme for AIS.

California

The California Ballast Water Management and Control Program was established in January 2000. All vessels calling on ports in California after operating outside the U.S. Exclusive Economic Zone are required to manage their ballast water and report those management activities to the California State Lands Commission (CSLC). The CSLC considers hull fouling to be of equal importance to ballast water.[13] The California ballast water management program has adopted the federal guidelines and therefore contains provisions to address fouling.

> The master, owner, operator, or person in charge of a vessel carrying, or capable of carrying, ballast water, that operates in the waters of the state shall do all of the following to minimize the uptake and the release of nonindigenous species:
>
> * * *
>
> (e) Rinse anchors and anchor chains when retrieving the anchor to remove organisms and sediments at their place of origin.
>
> (f) Remove fouling organisms from hull, piping, and tanks on a regular basis, and dispose of any removed substances in accordance with local, state, and federal law.[14]

Hawaii

Hawaii has a statewide Ballast Water and Hull Fouling Prevention Program. The state Legislature designated the Hawaii Department of Land and Natural Resources (DLNR) as "the lead state agency for preventing the introduction and carrying out the destruction of alien aquatic organisms through the regulation of ballast water discharges and hull fouling organisms."[15] The DLNR is authorized to establish an interagency team and adopt administrative rules. Hawaii is developing its program in two stages. Phase I focuses on ballast water management and Phase II on hull fouling. Proposed rules have been drafted for ballast water, but Phase II has yet to be developed. Paul Murakawa, program coordinator, projects a target date of 2007/2008 for a completed hull fouling prevention plan, but much depends on research and funding.[16] "Without dedicated funds it is unknown when, or if, regulations or administrative rules will be developed for the hull-fouling portion of the prevention program."[17] The Hawaii Alien Aquatic Organism

---

[13] CSLC, Report on the California Ballast Water Program (Feb. 2003) *available at* http://www.slc.ca.gov/Division_Pages/MFD/MFD_Programs/Ballast_Water/Documents/LegRptFull.pdf .

[14] CALIFORNIA PUBLIC RESOURCES CODE § 71204 (2005).

[15] HAWAII REVISED STATUTES § 187A-32(a) (2004).

[16] E-mail from Paul Murakawa, Aquatic Biologist, DLNR to Danny Davis, Research Associate, Sea Grant Law Center (Sept. 14, 2004).

[17] State of Hawaii AIS Management Plan 3-21 (Sept. 2003).

Task Force (AAOTF) is currently working with a group of stakeholders to identify criteria that will support a risk assessment strategy for hull fouling.[18]

Maryland

In July 2002, Maryland implemented its ballast water management program. The Department of the Environment is the responsible agency. Maryland's program is almost identical to the U.S. Coast Guard's program. Maryland incorporated by reference the federal guidelines for ballast water management and control,[19] which, as mentioned above, require vessels equipped with ballast water tanks to rinse anchors and anchor chains and remove fouling organisms from hulls, pipes, and tanks.

Minnesota

In Minnesota, "a person may not place or attempt to place into waters of the state a watercraft, a trailer, or plant harvesting equipment that has aquatic macrophytes, zebra mussels, or prohibited invasive species attached."[20] While the law does not specifically mention hull fouling and is primarily concerned with the removal of aquatic plants, a boat owner would be unable to place his/her boat in the water if harmful fouling organisms are attached to the vessel. There are a few exceptions:

> Unless otherwise prohibited by law, a person may place into the waters of the state a watercraft or trailer with aquatic macrophytes:
>
> > (1) that are duckweeds in the family Lemnaceae;
> > (2) for purposes of shooting or observation blinds in amounts sufficient for that purpose, if the aquatic macrophytes are emergent and cut above the waterline;
> > (3) that are wild rice harvested under section 84.091; or
> > (4) in the form of fragments of emergent aquatic macrophytes incidentally transported in or on watercraft or decoys used for waterfowl hunting during the waterfowl season.[21]

Minnesota conservation officers may order:

> (1) the removal of aquatic macrophytes or prohibited exotic species from a trailer or watercraft before it is placed into waters of the state;
> (2) confinement of the watercraft at a mooring, dock, or other location until the watercraft is removed from the water; and
> (3) removal of a watercraft from waters of the state to remove prohibited exotic

---

[18] *Id.* at 3-26.
[19] CODE OF MARYLAND REGULATIONS, title 26 §§ 25.02.03, 25.03.03 (2005).
[20] MINNESOTA STATUTES. § 84D.10 (2004).
[21] *Id.*

> species if the water has not been designated by the commissioner as being infested with that species.[22]

To reduce the spread of exotic species via watercraft, the Minnesota Department of Natural Resources (MDNR) has established a Watercraft Inspection Program. In 2004, MDNR inspected 50,000 watercraft.[23] Watercraft inspectors, the majority of whom are college interns, conduct inspections at public water access sites on lakes and rivers that are infested with harmful exotic species from late April to early October. In addition to inspecting watercraft, inspectors inform boaters of the state laws and proper removal methods.

Wisconsin

In Wisconsin, no person may place or use a boat or boating equipment or place a boat trailer "in a navigable water if the person has reason to believe that the boat, boat trailer, or boating equipment has any aquatic plants attached" or "in the Lower St. Croix River if the person has reason to believe that the boat, boat trailer or boating equipment has zebra mussels attached."[24] Law enforcement officers have the authority to order a person to:

> (a) Remove aquatic plants from a boat, boat trailer, or boating equipment before placing it in a navigable water.
> (b) Remove or not place a boat, boat trailer, or boating equipment in a navigable water if the law enforcement officer has reason to believe that the boat, boat trailer, or boating equipment has aquatic plants attached.
> (c) Remove zebra mussels from a boat, boat trailer or boating equipment before placing it in the Lower St. Croix River.
> (d) Remove or not place a boat, boat trailer or boating equipment in a navigable water if the law enforcement officer has reason to believe that the boat, boat trailer or boating equipment has zebra mussels attached.[25]

As in Minnesota, this law is primarily intended to encourage the removal of aquatic plants. Wisconsin's law is narrower, however, in that boat owners are prohibited only from launching their boats in one river if zebra mussels are attached. In Minnesota, launching in any state waters with zebra mussels or other prohibited species is illegal.

Vermont

In Vermont it is illegal to transport zebra mussels, Eurasian watermilfoil, quagga mussels (Dreissena bugensis), or water chestnuts to or from any Vermont surface water.[26] The Commissioner of Motor Vehicles is required to "enclose with every permanent and temporary motorboat registration and registration renewal certificate issued pursuant to this chapter the following statement:

---

[22] *Id.*
[23] MDNR, Harmful Exotic Species of Aquatic Plants and Wild Animals in Minnesota, Annual Report Summary for 2004, 4, *available at* http://files.dnr.state.mn.us/ecological_services/invasives/annualreport_summary.pdf .
[24] WISCONSIN STATUTES § 30.715 (2004).
[25] *Id.* § 30.715(3).
[26] VERMONT STATUTES ANNOTATED, title 10, § 1266 (2004).

> ’I. Transporting zebra mussels or Eurasian milfoil to or from any Vermont water surface is illegal (10 V.S.A. § 1266).
>
> ’II. If your boat or equipment is exposed to Lake Champlain or any other zebra mussel or Eurasian milfoil infested water, the following steps should be taken prior to putting your boat or equipment in another Vermont lake, pond or other water body:
>
> ‘A. Inspect for and scrape off from your boat's hull or equipment or any exposed areas any visible mussels or milfoil.
>
> ‘B. Carefully flush with clean water all boat hulls, outdrive, live wells, bilge, trailers, anchors, ropes, bait buckets, raw engine cabling systems and other boat parts or equipment.
>
> ‘C. Dry boats, trailers and equipment thoroughly in the sun.’”[27]

Virginia

Virginia has adopted *voluntary* ballast water management guidelines modeled after the federal ballast water program.

> Masters, owners, operators, or persons-in-charge of vessels equipped with ballast water tanks that operate in Virginia's territorial waters are requested to take the following voluntary precautions to minimize the uptake and release of harmful aquatic organisms, pathogens, and sediments:
>
> * * *
>
> 5. Rinse anchors and anchor chains when the anchor is retrieved to remove organisms and sediments at their place of origin.
>
> 6. Remove fouling organisms from hull, piping, and tanks on a regular basis and dispose of any removed substances in accordance with applicable regulations.[28]

Canada, Mexico, and Regional Efforts

Canada and Mexico do not have legal regimes for hull fouling. Canada does have a ballast water management program. Environment Canada is the lead agency on the overall topic of invasive species. The Canadian Department of Fisheries and Oceans (DFO) shares responsibility for ballast water with Transport Canada. The DFO has adopted voluntary ballast water management guidelines and the government is drafting regulations for mandatory ballast water management which will be compatible with U.S. regulations for the Great Lakes and the

---

[27] VERMONT STATUTES ANNOTATED, title 23, § 3305 (2004).
[28] 4 VIRGINIA ADMINISTRATIVE CODE § 20-398-30 (2005).

St. Lawrence River systems.[29] Although shipping and recreational boating have been identified as priority pathways by the Task Group on Aquatic Invasive Species under the Canadian Council of Fisheries and Aquaculture Ministers, no legislation or regulations appear to separately address hull fouling.

Only cursory research on Mexican law was conducted due to language barriers and time constraints, but the Law Center is confident that there are no specific legal mechanisms for the control and management of hull fouling. The foundations for a legal regime for hull fouling, however, are already in place. The Ministry of Agriculture, Livestock, Rural Development, Fisheries, and Food and the Secretariat of Environment and Natural Resources (SEMARNAP) are the primary agencies with authority for invasive species management and control. The General Law on Ecological Balance and Environmental Protection establishes the obligation of the federal government to protect aquatic ecosystems.[30] Additionally, the Federal Attorney General for Environmental Protection (Profepa), a separate unit within SEMARNAP, "is specifically authorized to conduct enforcement activities and prevent the unauthorized introduction of aquatic flora and fauna species."[31]

In addition to the collaborative efforts of Canada and the U.S. with respect to ballast water management in the Great Lakes, a tri-national effort is underway to address aquatic invasive species. In 1993, Canada, Mexico, and the U.S. signed a side agreement to the North American Free Trade Agreement (NAFTA) – the North American Agreement on Environmental Cooperation. The NAAEC established the Commission on Environmental Cooperation (CEC) to address regional environmental concerns and promote the effective enforcement of environmental laws. One of the CEC's major projects within its Conservation of Biodiversity Program is "Closing the Pathways of Aquatic Invasive Species across North America." The AIS project "seeks to protect North America's marine and aquatic ecosystems from the effects of aquatic invasive species. The initiative will assist the development of a North American approach to prevention and control aimed at eliminating pathways for the introduction of invasive species among the coastal and fresh waters of Canada, Mexico and the United States."[32] One of the main objectives of the program is to "identify aquatic invasive species and pathways of invasion that concern two or more countries and steward cooperative plans of action to address those priority species and pathways."[33] The CEC is currently in the assessment phase.

Foreign Legal Regimes

New Zealand

The New Zealand Ministry of Fisheries (MFish) is using a combination of regulatory and voluntary measures, and public education to curb the invasion of nonnative species carried on vessels' hulls. Surveys have been conducted to document the native and introduced species present in some ports and marinas, thus giving a reference point from which to find newly

[29] Government Response to the 4th Report of the Standing Committee on Fisheries and Oceans – Aquatic Invasive Species: Uninvited Guests, *available at* http://www.dfo-mpo.gc.ca/communic/reports/aquaspec-espaqua/resp-rep_e.htm.
[30] Meinhard Dolle, Legal and Policy Responses to Invasive Species, Background Paper prepared for the Commission on Environmental Cooperation 11 (March 2001).
[31] *Id.* at 13.
[32] CEC, North American Agenda for Action: 2003-2005 44 (Dec. 2002) *available at* http://www.cec.org.
[33] *Id.*

arriving foreign species. About 148 organisms have invaded New Zealand waters, with seventy percent of those likely arriving by hull fouling. MFish monitors major ports, maintains a surveillance network for specific invasive species utilizing government inspectors and the general public, and responds to introductions of foreign species. To get help from the public, pamphlets and posters were printed and given to coastal organizations, merchants, councils, associations, researchers and agencies associated with the coast. A "Marine Invaders" telephone hotline was set up to encourage the public to notify MFish of invasive species sightings. Action plans have been formed to deal with the invaders, and seven marine species have been listed as unwanted, to aid the public in recognizing and reporting those foreign organisms.

In 1993, New Zealand passed the Biosecurity Act, to exclude unwanted organisms using border control, and to destroy or manage aquatic pests already in the country. The Act regulates the holding, disposal and treatment of "risk goods," which are "any organism, organic material, or other thing, or substance, that (by reason of its nature, origin, or other relevant factors) it is reasonable to suspect constitutes, harbours, or contains an organism that may . . . cause unwanted harm to natural and physical resources or human health in New Zealand; or interfere with the diagnosis, management, or treatment, in New Zealand, of pests or unwanted organisms." Hull fouling falls within the definition of "risk goods" under the Biosecurity Act.

Regulations were proposed in New Zealand that required all vessels requiring a cleaning of their fouled hulls to be cleaned in facilities with containment abilities. The facilities would have also had to collect any discharges of fouling organisms and filter the discharge water to extract all organisms having a volume over 60 microns. The regulation was opened for public comment, and was subsequently deferred until better information becomes available.[34] Currently, a voluntary guideline is in place, asking boaters to clean any fouling on their boats before departing from a foreign port, or have their vessel cleaned within four days of arrival. The government cautions against removing fouling by beaching the vessels or cleaning the hulls in water, unless the fouling is no more than a slime layer.

Australia

In 1998, Australia developed its Oceans Policy[35] to prevent and manage invasive marine species. Though the Policy bans tributyltin (TBT) on vessels in Australia beginning in January of 2006, the Policy also cites hull fouling as a major transport for non-native species into Australian waters. A Joint Standing Committee on Conservation (SCC) and a Standing Committee on Fisheries and Aquaculture National Taskforce on the Prevention and Management of Marine Pest Incursions (SCFA) were created to study the problem of hull fouling as an invasive marine species vector, and to help develop a safe, cheap, and eco-friendly alternative to TBT. Researchers from Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Smithsonian Environmental Research Center in Maryland developed a set of twin database systems, which allows information sharing on the identification, biology, distribution and management of invasive species.

Australia's National Introduced Marine Pests Coordinaton Group (NIMPCG) was created in 2001.[36] The Group is constructing rules for the National System for the Prevention and

---

[34] E-mail from Liz Jones, New Zealand Ministry of Fisheries to Jason Savarese, Research Counsel, National Sea Grant Law Center (Sept. 2, 2004).

[35] http://www.oceans.gov.au/the_oceans_policy_overview.jsp .

[36] http://www.deh.gov.au/coasts/imps/.

Management of Introduced Marine Pest Incursions, which will try to prevent the introduction of new pest species to Australia, develop emergency response measures for discovered pests and manage existing, unwanted species. Victoria's state EPA requires vessels weighing less than 200 tons to discard removed organisms on land. South Australia state law forces slipway owners to use bunding (a large, impermeable "tub" that acts as a barrier to retain water that must be cleaned of organisms) and to allow no residues back into the water.

In 1997 the Australian and New Zealand Environment and Conservation Council (ANZECC) issued a Code of Practice for all commercial vessels in Australian waters.[37] It prohibits in-water removal of fouling, with an exception for emergency conditions. Before sea chests or propellers can be cleaned, the administering authority must be given 5 days notice, including details of the collection process and disposal of removed material.

Conclusion

The U.S. is slowly beginning to adopt laws and regulations to address hull fouling. Development of a comprehensive regulatory scheme, however, is hindered by a lack of knowledge and funding. In addition, the hull fouling threat is overshadowed by ballast water. States, however, can use this to their advantage. The federal government's ballast water regulations mandate that vessel owners remove and properly dispose of fouling organisms, as do several states. Hull fouling is therefore addressed by the Coast Guard and its state counterparts during routine annual inspections. While some states, like Hawaii, are considering separate hull fouling programs, incorporating hull fouling management into existing ballast water laws and regulations may be the easiest and most cost-effective option currently available to states.

[37] http://www.deh.gov.au/coasts/pollution/antifouling/code/pubs/code.pdf .