

PREVENTING AND MANAGING HULL FOULING: INTERNATIONAL, FEDERAL, AND STATE LAWS AND POLICIES

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INTRODUCTION

Shipping remains the major culprit behind the introduction of nonindigenous species across the globe. Ballast water from ships has been labeled the primary vector for the transport of aquatic nuisance species, but more attention should be focused on hull fouling. With more than 438 million m² of wet ship hull surface area arriving in U.S. ports and harbors each year, hull fouling as a vector for invasive species is a real concern. A study of Hawaiian waters concluded that 90 percent of 343 marine invading species had likely arrived via fouled ship hulls. A recent study reported that 36 percent of invasive coastal marine species in North America could be the result of hull fouling alone, while ballast water represented only 20 percent.

Fouling is the process of sessile plants and invertebrates attaching themselves to submerged objects, such as boat hulls, underwater cables, and oil platforms. The creatures latch onto submerged ship hulls, creating small, living communities that travel with the ships to areas where the animals have never before been found. The animals can establish new homes in foreign waters, competing with native species for food and habitat. Fouling also reduces the fuel efficiency and speed of affected ships, which increases their operating costs. To lessen hull fouling, biocidal anti-fouling paints have been applied to the bottoms of ships for decades. The paints slowly leach into the water, killing anything attached to the ship hull, but the leachates have also been found to accumulate in harbors and the sea. Paints containing tributyltin (TBT) have been one of the most effective deterrents to hull fouling organisms, but studies have linked TBT accumulations to deformations in oysters and sex changes in whelks. National bans on the use of the TBT paint will result in increased hull fouling, unless environmentally-friendly replacement paints are accepted by the shipping industry.

This paper reviews current and pending hull fouling legal regimes in the U.S. Because the United States will probably look to the control programs of other nations for guidance in designing its domestic policy on hull fouling, the hull fouling management programs of other nations, like Australia, New Zealand, and the Netherlands, are briefly highlighted. The international Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention) will also be discussed.

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

The EPA released its final ambient water quality criteria for TBT in January 2004, pursuant to Section 304(a) of the Clean Water Act (CWA). The criteria apply to both fresh and saltwater, and were designed for use by states and Native American tribes in

developing their own TBT water quality standards. Though the EPA's criteria are not legally binding, National Pollutant Discharge Elimination System (NPDES) permits and related environmental programs may make the criteria enforceable. For freshwater, the EPA recommends a maximum one-hour average concentration of 0.46 µg/L of TBT, not occurring more than an average of once every three years (acute criterion), and a four-day average TBT concentration of no more than 0.072 µg/l, on an average of once every three years (chronic criterion). For saltwater, TBT's acute criterion is 0.42 µg/L and the chronic criterion maximum is 0.0074 µg/L. Locally important freshwater and saltwater species that are very sensitive to TBT levels may require lower thresholds.

The EPA has asked TBT-bearing coating vendors to voluntarily cancel TBT paint registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). FIFRA regulates the sale and use of pesticides in the United States. The EPA has also stated that "Vessels painted with TBT antifouling systems after 1/1/2003 may be refused entry into US and other ports, or subject to other penalties," after the AFS Convention becomes active. The EPA is also working with the U.S. Naval Sea Systems Command (NAVSEA) on a Uniform National Discharge Standards (UNDS) program. UNDS will create rules to govern numerous aqueous discharges from the Army, Navy, Military Sealift Command, and Coast Guard. The EPA and NAVSEA are also exploring the creation and use of Marine Pollution Control Devices to manage or avert vessel discharges into the waters of the U.S., including antifouling marine coating leachate.

U.S. COAST GUARD

A new federal mandatory ballast water management statute directs the Coast Guard, under its duties of vessel inspection, to limit hull fouling by requiring "Masters, owners, operators, or persons-in-charge of all vessels equipped with ballast water tanks that operate in the waters of the U.S." to wash, on-site, their anchors and anchor chains hoisted from the water.¹ Fouling organisms must be cleaned from "hull, piping, and tanks on a regular basis," and must be disposed of in a way that meets Federal, State, and local requirements.² Violations can result in fines of \$27,000 per day and twelve years in jail.

CALIFORNIA

California law lists tributyltin as a restricted pesticide, which includes any "organotin... or a tri-organotin compound formulated as an antifouling paint, coating or compound and labeled for the control of fouling organisms in an aquatic environment." California restricts the use of TBT to vessels over 84 feet in length, vessels with aluminum hulls, and outboard motors and lower drive units. This limited use rule bans the use of TBT on "docks, piers, nets and other fishing equipment." Purchasing TBT paints requires a copy of the vessel registration to verify the vessel to be painted meets the requirements of California law, or a sworn statement affirming compliance. TBT oxide pesticides, sold as additives for mixing with paints or coatings, cannot be applied in any way "to any surface that comes into contact with the aquatic or marine environment including, but not limited to, vessels, piers and fishing equipment." California also limits the average release rate for TBT antifouling paints or coatings to a maximum of "four micrograms of organotin per square centimeter per day as determined by the Environmental Protection Agency

testing procedure.” The sale or possession of a pesticide product containing TBT, used to limit fouling in cooling water systems in many California counties, is prohibited.

The San Francisco Bay and the Central Valley State Regional Water Resources Control Boards have been ordered to “prohibit the direct discharge of tributyltin... from in-water stripping operations... Evaluate the impacts of in-water cleaning of vessels,” and “Require NPDES permits for boat and shipyards to regulate the discharge of tributyltin and copper.” California is also considering a ban on the use of copper biocides, due to possible environmental damage caused by copper accumulation in the marinas and waterways.

WASHINGTON AND ALASKA

Washington state limits copper discharge from shipyard dry-docks on Puget Sound. This is accomplished through NPDES permits tailored to the conditions and facilities in individual shipyards. In Alaskan waters, ships must not be repainted with TBT paint, though a TBT-based antifouling paint having a slow release rate that meets EPA standards may be sold and used.

AUSTRALIA

In 1998, Australia developed its Oceans Policy, to prevent and manage invasive marine species. Though the Policy bans TBT on vessels in Australia beginning in January of 2006, the Policy also cites hull fouling as major transport for nonnative species into Australian waters. A Joint Standing Committee on Conservation and a Standing Committee on Fisheries and Aquaculture National Taskforce on the Prevention and Management of Marine Pest Incursions 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 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 was created in 2001. The Group is constructing rules for a National System for the Prevention and Management of Introduced Marine Pest Incursions. The System will be designed 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) when removing hull fouling so that no removed organism gets back into the water.

In 1997 the Australian and New Zealand Environment and Conservation Council issued a Code of Practice for all commercial vessels in Australian waters. 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.

NEW ZEALAND

The New Zealand Ministry of Fisheries (MFish) is using a combination of regulations, voluntary measures, and public education to curb the invasion of nonnative fouling species. 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 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, which attempts to limit invasive organisms through 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.

Hull cleaning regulations were proposed in New Zealand a few years ago. These regulations would have required hull fouling removal to be performed 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 became available. 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.

THE NETHERLANDS

The use of copper-containing antifouling paint has been banned in the Netherlands for use on personal watercraft, but continues to be used by the shipping industry, the offshore industry, and the Netherlands Navy. The Netherlands also banned the cleaning or scrubbing of copper-bearing antifouling coatings. However, as of mid-2001, the sale, purchase, and possession of the paint was still legal. The Netherlands Board for the

Admission of Pesticides (College Voor de Toelating van Bestrijdingsmiddelen or CTB) regulates antifouling paints as pesticides, under authority from the 1962 Pesticides Act. As a member of the European Union (EU), the Netherlands is obliged to follow the EU's Biocidal Products Directive, which seeks to regulate and register all chemical biocides throughout the EU. This program is reviewing many different types of biocide products including pesticides, biocides, and anti-foulants. Under the Directive, anti-foulants produced before May 2000 may still be used, under a ten-year review program. Anti-foulants produced after May 2000 require full EU evaluation and approval before sale.

INTERNATIONAL EFFORTS

The International Maritime Organization produced the International Convention on the Control of Harmful Anti-fouling Systems on Ships in 2001, which bans the use of environmentally-damaging ship hull "anti-fouling systems." Practically speaking, this means nations that agree to the Convention must ban or restrict the use of organotin-based (chemical compounds containing tin and carbon) marine paints on ships registered under the laws of a Party to the Convention, as well as ships using any of that nation's ports, shipyards, or offshore facilities. The Convention requires ships of 400 gross tonnage and above, that sail internationally, to pass a screening before receiving a required International Anti-fouling System Certificate (Certificate). The Certificate must be renewed when antifouling systems (like paint) are changed or replaced. Ships over 78 feet in length, but less than 400 gross tonnage, which sail internationally, must keep onboard a "Declaration on Anti-fouling Systems," including proof of compliance with the Convention, such as a paint receipt or contractor invoice. The ban on applying or reapplying organotin-based systems began January 1, 2003. By January 1, 2008, ships either must bear no organotin compounds on their hulls or surfaces, or must have covered the non-complying organotin layer with a coating to prevent the organotins from leaching into the water. None of these rules apply to fixed platforms, floating platforms, Floating Storage Units or Floating Production, Storage and Offshore Loading structures. The AFS Convention is not yet in force. The Convention becomes active 12 months after 25 States representing 25% of the world's merchant shipping tonnage have ratified it. As of January 31, 2005, ten nations have agreed to the Convention, representing 9.18% of the world's fleet. The U.S. has signed the treaty, but it has not yet been sent to the Senate for ratification.

SOURCES CITED

1. 33 C.F.R. § 151.2035(a)(5) and (6) (2005).
2. *Id.*

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