A REVIEW OF INTERNATIONAL, FEDERAL, STATE, AND PROVINCIAL REGULATORY ROLES AND RESPONSIBILITIES RELATING TO AQUATIC MARINE INVASIVE SPECIES ON THE WEST COAST

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I. BACKGROUND

Marine invasive species pose a significant threat to the West Coast states and British Columbia by threatening native flora and fauna, converting habitats, damaging equipment and infrastructure through biofouling, and negatively affecting tourism and recreation.

Aquatic invasive species are introduced to West Coast marine waters through a variety of vectors,[1] including:

- transportation-related pathways, i.e., commercial shipping (both ballast water and vessel biofouling), boating and sea planes (including recreational fishing and water sports), construction in aquatic environments, water delivery and diversion systems, maritime activities (e.g., dry docks, shipbreaking, and drilling platforms); and oil and gas activities[2];
- pathways involving commerce of live organisms, i.e., live bait industry, live imported seafood, aquaculture, recreational fisheries enhancement, aquarium and aquascaping, research, and educational activities;
- human-mediated pathways, i.e., climate change, marine debris, and ecosystem disturbance; and
- natural spread.

The west coast of the United States and Canada is increasingly susceptible to marine invasive invasions particularly because of its role in the world economy and the amount of global shipping that occurs through West Coast ports. In addition, the rate of bioinvasions is continuing at an alarming rate, and as seaborne trade increases, bioinvasions increase.[3]

Managing invasive species in a marine environment poses a specific set of challenges. Information on the biology of many marine species and communities is limited, the public perceives the ocean and coast to be relatively pristine, coastal managers can adopt defeatist attitudes toward the control or eradication of marine species, and there is a perception that management taken at one location will ultimately affect large areas of coastline. This leads to opposition of management activities, the perception that local eradication efforts are futile because of the ability of ocean currents to transport invasive species, and the recognition that responsibilities for marine invasives are so diffuse that costs, benefits, and authorities are limited.[4]

Understanding the regulatory roles and responsibilities as they apply to aquatic invasive species in the marine environment will help identify gaps and challenges as well as opportunities to enhance interjurisdictional coordination and management. This is critically important when addressing emerging marine invasives, as agencies cannot regulate when gaps in laws, which are generally subject to interpretation, exist.[5]

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[1] Molnar, J. L., R. L. Gamboa, C. Revenga, and M. D. Spalding. 2008. Assessing the Global Threat of Invasive Species to Marine Biodiversity. *Front Ecol Environ* 6(9): doi: 10.1890/070064.
[2] http://www.westernais.org/media/articlesissuepapers/ipieca-alien-invasive-species-and-the-oil-and-gas-industry.pdf
[3] International Maritime Organization, http://www.imo.org.
[4] Thresher, R.E., and A. M. Kuris. 2004. Options for Managing Invasive Marine Species. *Biological Invasions*, (6) 295-300.
[5] Windle, P.N. 2011. Regulation (U.S.) Pages 575-580 *in* Encyclopedia of Biological Invasives, ed., D. Simberloff and M. Rejmanek. University of California Press. 765pp.

Regulatory roles and responsibilities for five coastal states (California, Washington, Oregon, Hawaii, and Alaska) and one Canadian province (British Columbia) are summarized, and a gap analysis and set of recommendations to address existing deficiencies are proposed.

II. INTERNATIONAL LAWS AND REGULATIONS

A patchwork of international laws, codes of conduct and guidelines, global conventions, regional conventions, and organizations and agreements exist relative to the management of marine aquatic invasives:

- The **International Convention for the Control and Management of Ships' Ballast Water and Sediments**[6] was adopted by the International Maritime Organization (IMO) in February 2004 and becomes effective one year after it has been ratified by at least 30 countries representing 35% of world shipping tonnage. As of March 2015, 44 countries representing a combined tonnage of 32.86% of the world's merchant fleet have ratified the convention.[7] The convention establishes performance standards for ballast water discharge to prevent the spread of marine AIS to different regions. The convention requires all ships in international traffic to manage their ballast water and sediments to standards described in each ship's ballast water management plan. The standards set limits on the number of living organisms allowed in ballast water discharge and will likely require shipboard ballast treatment system technology for most vessel types.

- The **International Convention on the Control of Harmful Anti-fouling Systems on Ships**[8] prohibits the use of harmful organotins in anti-fouling paints (e.g., Tributyltin) used on ships and establishes a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems.

- The **International Council for the Exploration of the Sea**[9] (ICES) has a **Code of Practice on the Introductions and Transfers of Marine Organisms**[10] (1994). The code is intended to reduce the risks of adverse effects arising from introduction by non-indigenous marine species, and has been subsequently modified to address genetic issues. The code makes recommendations relative to: (1) the steps to take prior to introducing a new species, (2) the steps to take after deciding to proceed with an introduction, (3) the prevention of unauthorized introductions by Member Countries, (4) policies for ongoing introductions or transfers which have been an established part of commercial practice, and (5) the steps to take prior to releasing genetically modified organisms.

- The **International Convention for the Prevention of Pollution from Ships**[11] (MARPOL) is intended to minimize pollution of the oceans and seas, including dumping, oil and air pollution.

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[6] http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships'-Ballast-Water-and-Sediments-(BWM).aspx.
[7] Class NK, http://www.classnk.com/hp/en/activities/statutory/ballastwater/index.html.
[8] http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-on-the-Control-of-Harmful-Anti-fouling-Systems-on-Ships-(AFS).aspx.
[9] http://www.ices.dk/Pages/default.aspx.
[10] http://iea.uoregon.edu/pages/MarineMammals/engine/Documents/1-0288-0293.htm.
[11] https://treaties.un.org/doc/Publication/UNTS/Volume%201340/volume-1340-I-22484-English.pdf

- **Codes of Conduct and Guidelines**:
    - **Alien species: Guiding principles for the prevention, introduction and mitigation of impacts**[12] was developed in 1999 by the **Convention on Biologica Diversity**aimed at unintentional and intentional introductions of non-indigenous plant and animal species introduced via ballast water and imports.

    - **IMO guidelines** for the control and management of ships' ballast water are non-mandatory recommendations that member states (national governments) are urged to adopt to minimize transfer of harmful aquatic organisms and pathogens.[13]

    - **IUCN position statement on translocation of living organisms**[14]: Introductions, reintroductions, and re-stocking aimed at plant and animal non-native species introduced via unintentional introductions via use of live fish bait, tourist transfer, and cross-regional civil engineering projects as well as intentional introductions via release of captive-bred or newly-domesticated organisms, trade in alien species, reintroductions, re-stocking.

    - **North American Fisheries Policy**[15] aimed at non-indigenous fish and other exotic aquatic species introduced intentionally and unintentionally and with applicability to aquaculture.

- **Global Conventions:**
    - **Convention on International Trade in Endangered Species** (CITES)[16] aimed at species of flora and fauna that are threatened or endangered in exporting countries and introduced via trade.

    - **United Nations Convention on the Law of the Sea**[17] (UNCLOS) aimed at species causing significant and harmful changes to the marine environment via unintentional and intentional introductions.*

- **Regional Conventions:**
    - **North American Agreement on Environmental Cooperation**[18] (participation by the United States, Canada, and Mexico) aimed at exotic species and noting the Council on the Commission

[12] https://www.cbd.int/doc/meetings/sbstta/sbstta-05/official/sbstta-05-05-en.pdf.
[13] http://globallast.imo.org/wp-content/uploads/2015/01/Resolution-A.868_20_english.pdf.
[14] https://portals.iucn.org/library/sites/library/files/documents/PP-002.pdf.
[15] http://fisheries.org/docs/policy_statements/policy_1f.pdf.
[16] https://cites.org/.
[17] http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf.
[18] http://www.cec.org/Page.asp?PageID=1226&SiteNodeID=567.
*Note: The United States has not signed the UNC Law of the Sea Convention. It was rejected in 1982, and since that time, the full Senate has not voted on it. It requires parties to adopt regulations and laws to control pollution affecting the marine environment (T. Davis, pers. comm.).

on Environmental Co-operation may develop recommendations regarding exotic species that may be harmful.

- **Organizations and Agreements:**
  - **Agenda 21 UNCED 1992**[19] aimed at exotic plant and animal species introduced both intentionally and unintentionally
    - Chapter 17 – Protection of Oceans[20]
      - 17.30(vi): States to assess individually, regionally and internationally, within IMO and other relevant international organizations, need for adopting appropriate rules on ballast water discharge to prevent spread of non-indigenous organisms.
      - 17.79(d) strengthen the legal and regulatory framework for mariculture and aquaculture.
      - 17.83 Analyze aquaculture's potential and apply appropriate safeguards for introducing new species.

[19] http://habitat.igc.org/agenda21/.
[20] http://habitat.igc.org/agenda21/a21-17.htm.

II. ORGANIZATIONS AND PROGRAMS THAT COORDINATE INTERNATIONAL MANAGEMENT AND POLICY OF COASTAL INVASIVE SPECIES

A. International Union for the Conservation of Nature[21]

- Global Marine Programme
- Invasive Species Specialist Group

B. International Maritime Organization (United Nations): Marine Environmental Protection Committee[22]

C. International Council for the Exploration of the Sea:[23] Working Group on Ballast and Other Ship Vectors and Working Group on Introductions and Transfers

D. The Commission for Environmental Cooperation[24]

E. Global Invasive Species Threat Assessment[25] by ConserveOnline, The Nature Conservancy

F. Global Invasive Species Programme of the Commonwealth Agricultural Bureaux International, International Union for Conservation of Nature, The Nature Conservancy, and the South African Biodiversity Institute

[21] http://www.iucn.org/
[22] http://www.maritimenz.govt.nz/IMO/Committees-sub-committees/IMO-MEPC.asp
[23] http://www.ices.dk/Pages/default.aspx
[24] http://www.cec.org/
[25] https://www.conservationgateway.org/ConservationPractices/Marine/Pages/marineinvasives.aspx

III. U.S. FEDERAL AGENCY AUTHORITIES RELATIVE TO MARINE INVASIVE SPECIES

The US Fish and Wildlife Service, the US Coast Guard (USCG), and the US Environmental Protection Agency (EPA) are the leading agencies that draft, implement and revise invasive species regulations related to U.S. marine environments.[26] A 1993 Office of Technology (OTA) report on invasive species management concluded that "the current Federal effort is largely a patchwork of laws, regulations, policies and programs. Many only peripherally address NIS, while others address the more narrowly drawn problems of the past, not the broader emerging issues."[27] It has recently been noted that these observations remain true today.

A. US Department of Interior regulates importation of wildlife and manages invasive species on public lands.

a. The **US Fish and Wildlife Service** regulates imports of injurious wildlife; evaluates imported animals to determine injurious status; conducts activities to prevent, control and monitor aquatic nuisance species such as Chinese mitten crab, and others that threaten native species and the aquatic ecosystems; and provides cost-share grants to implement approved state aquatic nuisance species management plans. Its Branch of Invasive Species manages the Aquatic Nuisance Species Task Force[28] and its Aquatic Nuisance Species Program. The Aquatic Nuisance Species Task Force is an intergovernmental organization committed to preventing and controlling aquatic nuisance species and implementing the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990.

b. **Bureau of Reclamation**[29] focuses on invasive species infestation of water systems, including reservoirs, rivers, thousands of miles of distribution canals, rights-of-way, wetlands, and recreational areas. Invasive species of concern include zebra mussels, Chinese mitten crabs, hydrilla, water hyacinth, purple loosestrife, saltcedar and leafy spurge. These species can obstruct water flow, hinder access for maintenance and recreation, cause structural damage, and negatively affect water system operations, water quality, wildlife habitat and public use.

c. **US Geological Survey** focuses on researching factors influencing the invasion by invasive species and the effects of invasive species on ecosystem processes, native species, and landscape dynamics, especially on Department of Interior land; facilitates documentation, dissemination and integration of invasive species information; focuses on small number of highly invasive species, with emphasis on the Great Lakes and eastern waterways and wetlands, riparian ecosystems, and Hawaii, as well as invasive plants on western rangelands. Also, manages the national Nonindigenous Aquatic Species Database and several regional

[26] Ibid.
[27] Miller, M.L. 2011. Laws, federal and state. Pages 430-437 *in* Encyclopedia of Biological Invasives, ed., D. Simberloff and M. Rejmanek. University of California Press. 765pp.
[28] http://www.anstaskforce.gov/default.php
[29] http://www.usbr.gov/

databases (such as Hawaii, Colorado plateau, and northern prairie).

d. The **National Park Service** maintains a database of marine invasive species that threaten national parks.[30] The database contains a list of existing invasives as well as potential invasives with an associated risk rating.

B. Smithsonian Institution conducts research addresses the pattern, impact, and management of invasive species. The Smithsonian Environmental Research Center programs measure the pattern of transfer, invasion, and impact of invasive species on coastal marine and estuarine systems. It conducts specific projects to test methods to reduce the risk of species transfer in ship ballast water; documents the history of invasive species invasions in the Chesapeake Bay. In cooperation with Coast Guard, it established the National Ballast Water Information Clearinghouse to receive vessel ballast water management reporting forms, measure the changing patterns of ballast water delivery, manages vessels arriving in U.S. ports, and synthesizes national data on patterns and impacts of alien species in coastal ecosystems.

C. Department of State is involved in negotiations, international treaty activities, and cooperative intergovernmental efforts to address invasive species issues—e.g., catalyzes formation of a voluntary intergovernmental initiative to address the problem, negotiates in the International Maritime Organization to develop a treaty to address the introduction of invasive species in ballast water. These international efforts focus on safeguarding biodiversity, reducing negative ecological and economic impacts from invasive species, and reconciling the need to identify and manage invasive species pathways with the need to continue globalization and increase trade and travel.

D. Department of Homeland Security

a. The **US Coast Guard** is responsible for developing and implementing a ballast water management program to minimize the likelihood that invasive species can be transported to the United States in the ballast water of long-distance ocean vessels. The USCG regulates ballast water management through the Ballast Water Management Program under the National Invasive Species Act of 1996 and the 1990 Nonindigenous Aquatic Nuisance Prevention and Control Act. The program has established ballast water management practices for all vessels that operate in U.S. waters, including regulations for vessels entering U.S. waters after operating beyond the EEZ, and requires reporting and recordkeeping of ballasting operations by all vessels. (33 CFR Part 151, subparts C and D). The Coast Guard is the primary agency responsible for addressing hull fouling, not from a statutory basis, but through the outgrowth of its ballast water management and vessel inspections. The USCG implements IMO agreements related to the use of anti-fouling paints, ballast water regulations, and vessel monitoring.

[30] http://www.nature.nps.gov/water/marineinvasives/MISdatabase.cfm.

Mandatory practices:[31]

A 2012 Rule establishes four options for complying with US Coast Guard ballast water management requirements. New build vessels are required to meet these regulations beginning in 2014, while existing vessels must meet the requirements following their first drydock after January 2016. The options include:

- No ballast water discharge
- Meet the discharge standard by using a Coast Guard-approved ballast water management system
- Source ballast water solely from a public water supply
- Discharge ballast water to a reception facility

b. **Customs and Border Protection** (CBP) facilitates lawful international trade and travel, and guards water off the coast of Southern California. CBP works with USDA and the Department of Interior to enforce laws prohibiting or limiting the entry of invasive species.

E. The **US Environmental Protection Agency** (EPA) deals with invasive species in three general areas:

- Eliminating ballast water as a pathway for plants, animals, or microbial species not native to the United States
  - The USEPA manages all incidental vessel discharges, including ballast water, under Section 402 of the Clean Water Act National Pollutant Discharge System, which includes issuing a Vessel General Permit every five years under the NPDES program.
- Regulating pesticides that may be used to control invasive species, and
- Conducting research on the ecological impacts of invasive species.

The EPA leads U.S. activities under the North American Agreement for Environmental Cooperation, coordinates with Canada on Great Lakes issues, and manages the Great Lakes Baltic Sea Partnership Program.

F. Department of Commerce

a. The **National Oceanic and Atmospheric Administration**, the statutory co-chair of both the National Invasive Species Council and ANSTF, among other duties, monitors coastal areas for the presence of nonindigenous species.[32, 33] The primary law governing NOAA's role in addressing invasive species is the Nonindigenous Aquatic Nuisance Prevention and Control Act. NOAA has regulatory authority to prevent the introduction of invasive species that may affect marine sanctuaries; endangered or threatened species; coastal areas; and essential fish habitats. NOAA funds research, education and outreach, and control activities primarily through the National Sea Grant Program, with some activities funded through the National

[31] Extracted from University of California, West Coast Ballast Outreach.
[32] http://www.habitat.noaa.gov/restoration/programs/invasivespecies.html
[33] http://www.habitat.noaa.gov/pdf/best_management_practices/Replanting%20Project%20Sites.pdf

Ocean Service and National Marine Fisheries Service. Efforts focus on marine systems and the Great Lakes. Research efforts include monitoring the impacts of invasive species on coastal and other ecosystems, developing control and mitigation options, and preventing new introductions by, among other things, developing new technologies for ballast water management. Performs economic evaluations of the costs of aquatic invasive species and conducts control programs to eradicate and prevent their spread. NOAA also assists regions and states by providing technical support and best management practices to prevent and contain invasive species.

G. The **US Department of Agriculture** (USDA) oversees import and export of plants, regulates plant and animal pests, oversees use of biological control organisms, and manages invasive species on Forest Service land. It is authorized to prohibit or restrict the importation or interstate movement of any plant, plant product, biological control organism, noxious weed, article, or means of conveyance if the Secretary of Agriculture determines that the prohibition or restriction is necessary to prevent the introduction into the U.S., or the dissemination within the U.S., of a plant pest or noxious weed. The USDA may prohibit or restrict the importation, entry, exportation, or movement of the aforementioned in interstate commerce if it determines that prohibition or restriction is necessary to prevent the introduction into the United States, or the dissemination of a plant pest or noxious weed within the United States. The USDA is authorized to hold, seize, quarantine, treat, apply other remedial measures to destroy or otherwise dispose of any plant, plant pest, noxious weed, biological control organism, plant product, article or means of conveyance that is moving (or has moved) into or through the U.S. or interstate, if USDA considers it necessary in order to prevent the dissemination of a plant pest or noxious weed that is new to or not known to be widely prevalent or distributed within or throughout the United States. The USDA has the authority to order an owner, or an agent of the owner, of a plant, plant pest, noxious weed, biological control organism, plant product, article or means of conveyance to treat, destroy, or otherwise dispose of those items.

a. The **Animal Plant and Health Inspection Service** (APHIS) has the authority to regulate plants, plant products, and noxious weeds, and invests significant effort on invasive species that affect agriculture, however, they have the authority to act in "natural areas" as well. APHIS has quarantine inspection and regulatory enforcement programs at 172 U.S. ports of entry, conducts preclearance activities, risk analysis and permit decisions, treatment efforts, detection surveys, and eradication efforts of foreign pests that would threaten natural ecosystems.

b. Cooperative State Research, Education, and Extension Service funds integrated projects and competitively-based research relevant to improving public understanding of invasive species; funds research on cost-effective management, environmentally safe control of invasive species using biological, chemical, cultural, and mechanical practices and supports invasive species management to maximize effective and economical pest control and exclusion. Also provides linkages to address invasive species problems with local, state, and regional stakeholders.

The USDA requires a permit for the movement of species on the **federal Noxious Weed List**[34] (e.g., Caulerpa is an example of a marine species on that list).

H. The **Department of Defense** (1) controls movement of species during military operations (2) controls invasive species on military installations, and (3) researches and controls aquatic invasive species. DOD developed and implemented the Navy's ballast water management policy and set discharge standards for vessel ballast water to address the environmental impact of invasive species in ballast water. Other efforts include maintaining a noxious and nuisance plant management information system. DOD has an Invasive Species Management Program, and works with the EPA to set national performance standards to require the use of marine pollution control devices to control discharges incidental to the normal operation of armed forces vessels.

a. In addition, the **US Army Corps of Engineers**, using EPA's environmental criteria and subject to EPA's concurrence, issues permits for ocean dumping under the Marine Protection, Research, and Sanctuaries Act (1972)[35]. USACE supports aquatic plant control, which primarily involves invasive species in non-Corps waters.

I. Department of the Treasury U.S. Customs Service has a major operational role in preventing or restricting the entry of imported merchandise and its containers that could potentially be or are infested with invasive species. Customs personnel inspect passengers, baggage, and cargo at U.S. ports of entry to enforce or cooperate, as appropriate, in enforcing regulations/procedures of other federal agencies. Customs selectively inspects incoming passengers, baggage, and cargo based on risk management criteria, such as country-of-origin and other factors.

[34] http://plants.usda.gov/java/noxious.
[35] http://www.epw.senate.gov/mprsa72.pdf.

IV. U.S. FEDERAL LAWS RELEVANT TO MARINE INVASIVE SPECIES

A. The **Nonindigenous Aquatic Nuisance Prevention and Control Act Of 1990**[36] (amended in 2000) is the Act under which the USFWS Branch of Invasive Species manages the Aquatic Nuisance Species Task Force and its Aquatic Nuisance Species Program. In addition, the US Coast Guard manages ballast water through this Act, which is intended to prevent or reduce the introduction and control the spread of aquatic nuisance species via the discharge of ballast water from those vessels entering the Great Lakes after operating outside of the exclusive economic zone (EEZ). Although the Act was passed in response to zebra mussels in the Great Lakes (mandated ballast water management for vessels entering the Great Lakes), the Act focuses on all aquatics, including aquatic plants. The Aquatic Nuisance Species Task Force is an intergovernmental organization committed to preventing and controlling aquatic nuisance species and implementing the Act. The Task Force coordinates federal, state, and local governments, non-governmental organizations, academic institutions, and the private sector relative to aquatic nuisance species.

B. The **National Invasive Species Act (NISA) of 1996**[37] reauthorized and amended as the Non-Indigenous Aquatic Nuisance Prevention and Control Act, extended USCG ballast water management responsibilities to the entire nation. NISA created a national Task Force (16 U.S.C. §4721(a)) charged with developing and implementing a program to prevent the unintentional introduction and dispersal of aquatic nuisance species through ballast water management (id. §4722(a)).

   Under NISA, voluntary national guidelines to prevent the introduction and spread of nonindigenous species into U.S. waters via ballast water of commercial vessels were established until the USCG established more stringent requirements in 2006, and again in 2012 (id. §4711). The guidelines apply to vessels equipped with ballast water tanks and direct vessels that enter U.S. waters after operating beyond the Exclusive Economic Zone (EEZ) to undertake ballast exchange in the seas. The Secretary is also required to establish record keeping and reporting procedures and sampling techniques, based on the best available science, to monitor compliance (id. §4711(2) (F) (i), (G), and (I)). However, a vessel is not required to conduct ballast water exchange if the exchange would threaten the safety or stability of the vessel, its crew, or its passengers (id. §4711(c) (2)).

   Ecological and ballast discharge studies and surveys in waters highly susceptible to invasion or requiring further study must have surveys conducted (id. §4712(a)) to examine invasions and the effectiveness of ballast management and its guidelines.

   States, through their respective Governors, may submit their own comprehensive management plans to the Task Force for approval (id. §4724). These management plans identify areas or activities within each state or the surrounding region, except for those related to public facilities, for technical, enforcement,

[36] http://www.anstaskforce.gov/Documents/nanpca90.pdf.
[37] http://www.anstaskforce.gov/Documents/NISA1996.pdf.

or financial assistance (or any combination thereof) to reduce or eliminate the risks associated with aquatic nuisance species.

C. **Executive Order 13112**[38] requires that a Council of Departments dealing with invasive species be created to prevent the introduction of invasive species and provide for their control and to minimize the impacts that invasive species cause. The Executive Order created the National Invasive Species Council and the Invasive Species Advisory Committee, which work together with stakeholders, concerned members of the public, and member departments to address invasive species. The Council is comprised of federal agencies. The Committee is a group of non-federal experts and stakeholders. Together, they formulated an action plan for the nation. The Council issued the National Invasive Species Management Plan in 2001 to recommend actions to improve coordination, prevention, control and management of invasive species by the Federal agency members of the Council. More recently the Council issued its 2008 Plan, which focuses on five "Strategic Goals": Prevention; Early Detection and Rapid Response; Control and Management; Restoration; and Organizational Collaboration.

D. The **Alien Species Prevention and Enforcement Act**[39] of 1992 makes it illegal to ship plants or animals that are covered under the Lacey Act or the Plant Protection Act through the U.S. mail.

E. The **Plant Protection Act of 2000**[40] consolidates and modernizes all major statutes pertaining to plant protection and quarantine (Federal Noxious Weed Act, Plant Quarantine Act) and permits APHIS to address all types of weed issues. It also authorized APHIS to take both emergency and extraordinary emergency actions to address incursions of noxious weeds.

F. The **Clean Water Act** (CWA)[41] is the primary federal law that protects U.S. waters, including coastal areas (33 U.S.C. §1251(a)). A framework of standards, technical tools and financial assistance aims to reduce direct pollutant discharges into waterways and manage polluted runoff. Under Section 402 of the CWA, EPA establishes a General Permit for incidental vessel discharges, including ballast water.

G. Through the **Coastal Zone Management Act**[42] (CZMA) (16 U.S.C. §1451 et seq.), federal and state governments collaborate to "preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations" (16 U.S.C. §1452(1)). Invasive species issues can be incorporated into State Coastal Zone Management Plans through modification or amendment, subject to the approval of the Department of Commerce (DOC) (id. §1455(e)). Section 1555a(b) allows the DOC to make grants to eligible costal states to assist them in preserving or restoring specific areas, redevelopment of deteriorating and underused urban waterfronts and ports, access to public beaches or development of a permit process to regulate aquaculture facilities in the coastal zone. In addition, the Act establishes the National Estuarine Research Reserve

[38] http://www.invasivespeciesinfo.gov/laws/execorder.shtml.
[39] http://www.fws.gov/laws/lawsdigest/aliensp.html.
[40] http://www.gpo.gov/fdsys/pkg/PLAW-106publ224/pdf/PLAW-106publ224.pdf.
[41] http://www.epa.gov/agriculture/lcwa.html.
[42] http://www.epa.gov/agriculture/lzma.html.

System[43] (id. §1461(c)), through which monitoring and other invasive species research can be sponsored.

H. The **Endangered Species Act** (ESA)[44] (16 U.S.C. §1531 et seq.), jointly administered by the Secretaries of Interior and Commerce, contains provisions regulating import and export of listed species, and includes provisions relating to how invasive species may negatively affect a listed species. Section 7 of the ESA requires any federal agency to ensure that any action authorized, funded, or carried out by the agency not jeopardize the continued existence of any endangered or threatened species or adversely modify any critical habitat of such species (16 U.S.C. §1536(a)(2). Thus, each federal agency must consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, depending on the species, for any action that may affect a listed species. If the action is not likely to adversely affect a listed species, the appropriate Service issues a Biological Opinion, which may authorize take that is incidental to the action or, if the federal action would otherwise jeopardize the continued existence of the species, offer alternatives to the federal action that will avoid such jeopardy (id. §1536(b)). Any take of an endangered or threatened fish species unless otherwise authorized is unlawful under the statute (id. §1538). Thus, a federal agency will be held responsible for any unauthorized take directly or indirectly caused by the authorization, funding, or other federal action associated with invasive species.

I. **Federal Insecticide, Fungicide, and Rodenticide Act**[45] (FIFRA) (7 U.S.C. §136 ET SEQ.), provides federal control of pesticide distribution, sale, and use. The EPA has authority under FIFRA not only to study the consequences of pesticide usage but also to require users (farmers, utility companies, and others) to register when purchasing pesticides. All pesticides used in the United States must be registered (licensed) by EPA. Registration assures that pesticides will be properly labeled and that if used in accordance with specifications will not cause unreasonable harm to the environment. FIFRA is critical whenever pesticides are used to control or reduce the impact of invasive species. FIFRA also gives EPA review authority for biological control agents when they are used to control invasive pests.

J. The **Federal Noxious Weed Act**[46] (7 U.S.C. §2801 et seq.) (FNWA) has been replaced by the Plant Protection Act, 7 U.S.C. §7701 et seq., except for Section 2814. This section requires each federal agency to manage plant species that are classified as "undesirable, noxious, harmful, exotic, injurious, or poisonous" (7 U.S.C. §2814(e) (7)) on federal lands. They are to develop and coordinate a management program to control such plants on federal land and to enter into cooperative agreements with state agencies to implement their management plants. However, a federal agency is not required to implement a management plan on federal lands unless similar programs are being implemented on state or private lands in the same area.

[43] http://nerrs.noaa.gov/.
[44] http://www.fws.gov/endangered/laws-policies/.
[45] http://www.epa.gov/agriculture/lfra.html.
[46] http://www.fws.gov/laws/lawsdigest/FEDNOX.HTML.

K. The **Fish and Wildlife Coordination Act** [47](16 U.S.C. §661 et seq.) gives wildlife conservation equal consideration and coordination with other features of water resource development programs "through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation and rehabilitation. . ." (16 U.S.C. §661). The FWCA requires the Department of Interior to provide assistance to, and cooperate with, federal, state, and public or private agencies and organizations to control, manage, and protect wildlife resources (id. §661(1)). This Act authorizes the National Marine Fisheries Service to review development projects proposed or licensed by federal agencies and to make recommendations. It also makes funds available through grants and cooperative agreements that could encompass invasive species projects (id. §663).

L. **The Lacey Act**[48] (18 U.S.C. §42 et seq.), administered by the USFWS, prohibits importation into the United States, or any U.S. territory, or possession and shipment between the continental United States, the District of Columbia, Hawaii, the Commonwealth of Puerto Rico, and any possession of the U.S. of certain categories of animal species determined to be "injurious to human beings, to the interests of agriculture, horticulture, forestry, or to wildlife or the wildlife resources of the United States" (18 U.S.C. §42(a) (1)). The injurious wildlife provisions of the Lacey Act are one tool that the U.S. Fish and Wildlife Service (Service) uses to prevent illegal introductions of and to manage invasive species. The Service implements the injurious wildlife provisions (18 U.S.C. 42) through regulations contained in 50 CFR part 16. Species are added to the list of injurious wildlife to prevent their introduction or establishment through human movement in the United States to protect the health and welfare of humans, the interests of agriculture, horticulture or forestry, and the welfare and survival of wildlife resources from potential and actual negative impacts. Wildlife and wildlife resources are defined broadly to include all wild animals and "all types of aquatic and land vegetation upon which such wildlife resources are dependent" (id.). The statute gives the USFWS the authority to export or destroy any injurious species at the expense of the importer, although permits may be issued to allow importation of otherwise injurious species for specific purposes (id §42(a)(3)).

Several restrictions within the Lacey Act, however, limit its ability to comprehensively address invasive species introductions. It:

- Is limited to animals, and only those specifically listed along with mammals, birds, fish, amphibians, reptiles, mollusks, and crustaceans generally.
- Only applies to "wild" birds and mammals; presumably any species that has been domesticated could not be regulated.
- Excludes restrictions on any species that is regulated under the Plant Pest Act, explicitly stating that Section 42 does not authorize "any action with respect to the importation of any plant pest as defined in the Federal Plant Pest Act, insofar as such importation is subject to regulation under that Act." Thus any animal species whose importation is regulated under the Plant Pest

[47] http://www.usbr.gov/power/legislation/fwca.pdf.

[48] http://www.fws.gov/international/laws-treaties-agreements/us-conservation-laws/lacey-act.html.

Act cannot be regulated under the Lacey Act.

M. The **"other" Lacey Act** (16 U.S.C. §3371 et seq.). A separate provision known as the "other" Lacey Act also has implications for regulating introductions of invasive species. This law, administered by the Secretaries of the Interior, Commerce, and Agriculture, generally makes it unlawful for any person to import, export, transport, sell, receive, acquire, or purchase (or attempt to commit any such act) in interstate or foreign commerce any fish, wildlife, or plant taken, possessed, transported, or sold in violation of any federal, tribal, state, or foreign law (16 U.S.C. §3372(a)(1)(2)(4)). Although the statute does not substantively grant authority to regulate the importation, transportation, exportation, or possession of any species, violation of another federal, state, tribal, or foreign law governing these activities would become a violation of federal law and subject to particular civil and criminal penalties. The Secretaries of the Interior and Commerce have the authority to enforce laws involving fish and wildlife, while the Secretary of Agriculture has the authority to enforce laws involving plants. This statute also has restrictions, however, that limits its effectiveness to address invasive species introductions. As with 18 U.S.C. §42, the definition of fish or wildlife limits its application to "wild" animals. In addition, while the definition of fish or wildlife is broad ("any wild animal, whether alive or dead, including without limitation any wild mammal, bird, reptile, amphibian, fish, mollusk . . . or other invertebrate" (id. §3371(a)), the definition of plant is limited to "any wild member of the plant kingdom . . . which is indigenous to any state and which is either (A) listed on an appendix to the Convention on International Trade in Endangered Species of Wild Fauna and Flora, or (B) listed pursuant to any State law . . . ." (id. §3371(f)). Thus plants covered by the act are limited to those indigenous to the United States and listed under CITES or a state endangered species law; all other plants are not covered.

N. The **Magnuson-Stevens Fishery Conservation and Management Act**[49] (16 U.S.C. §1801 et seq.) includes Essential Fish Habitat (EFH) provisions (16 U.S.C. §1855) that provide for review of federal and/or other actions that could affect essential fish habitat with authority to make recommendations necessary to conserve essential fish habitat. Specifically, the DOC, in consultation with participants in the fishery, must provide each Fishery Management Council with recommendations and information regarding each fishery under that council's authority (id. §1855(b) (1) (B)). The purpose is to assist the Councils in identification of essential fish habitat (EFH), the adverse impacts on that habitat, and the actions that should be considered to ensure the conservation and enhancement of that habitat. Also, the DOC must review programs it administers and ensure that any relevant programs further the conservation and enhancement of EFH (id. §1855(b) (1) (C)). Finally, the DOC must coordinate with and provide information to other Federal agencies to further the conservation and enhancement of EFH (id. §1855(b) (1) (D)).

O. The **National Environmental Policy Act**[50] (NEPA) (42 U.S.C. §4221 et seq.) process can identify actions that are likely to affect invasive species or be affected by them. Analysis and review can identify

[49] http://www.nmfs.noaa.gov/sfa/magact/.

[50] http://www2.epa.gov/nepa.

potential problems with invasive species for a particular proposed action may also yield ideas for alternative methods of approaching an issue or other forms of mitigation. Agencies also need to comply with NEPA for actions that are proposed to respond quickly to invasive species management. In some cases, agencies may choose to prepare programmatic analyses on particular methodologies for addressing either the prevention or control of invasive species. In emergency situations that call for an immediate response by an agency that would normally require preparation of an environmental impact statement, the agency can work out alternative arrangements to their normal NEPA procedures with the Council of Environmental Quality.

P. The **National Marine Sanctuaries Act**[51] (NMSA) (16 U.S.C. §1431 et seq.) established the National Marine Sanctuary System to "improve the conservation, understanding, management, and wise and sustainable use of marine resources, enhance public awareness, understanding, and appreciation of the marine environment, and maintain for future generations the habitat and ecological services of the natural assemblages of living resources that inhabit these areas" (16 U.S.C. §1431(a) (4)).

   The Act requires the Department of Commerce to take actions to promote and coordinate the use of sanctuaries for research, monitoring, and education (id. §1440). In addition, the DOC may issue special use permits for specific activities, if necessary, to "establish conditions of access and use of any sanctuary resources or to promote public use and understanding of a sanctuary resource (id. §1441(a)). The DOC may enter into cooperative agreements, contracts, or other agreements with states, local governments, regional agencies, interstate agencies, or other persons in order to carry out the purposes and policies of the Act (id. §1442(a)).

   Under NMSA, it is unlawful for any person to "destroy, cause the loss, or injure any sanctuary resource managed under law or regulations for the sanctuary (id. §1436(I)). Sanctuaries regulate invasive species by prohibiting the introduction of any species. In California, there is a complete ban in all waters of Cordell Bank and Channel Islands and the federal waters of Monterey Bay and Greater Farallones. There are some very limited exceptions in California waters of Tomales Bay and Monterey Bay for commercial shellfish aquaculture—it has been determined by state and federal entities that species grown will not have an impact on sanctuary resources.

Q. The **Plant Protection Act**[52] (PPA) (7 U.S.C. §7701 et seq.) authorizes the USDA to prohibit or restrict the importation or interstate movement of any plant, plant product, biological control organism, noxious weed, article, or means of conveyance if the Secretary of Agriculture determines that the prohibition or restriction is necessary to prevent the introduction into the United States, or the dissemination within the United States, of a plant pest or noxious weed (7 U.S.C. §411(a)). The movement of plants, plant products, biological control organisms, noxious weeds, articles, and means of conveyance are also regulated (id. §412). The USDA may prohibit or restrict the importation, entry, exportation, or movement of the aforementioned in interstate commerce if it determines that prohibition or restriction is

[51] http://sanctuaries.noaa.gov/library/national/nmsa.pdf.
[52] https://www.law.cornell.edu/uscode/text/7/chapter-104.

necessary to prevent the introduction into the U.S. or the dissemination of a plant pest or noxious weed within the U.S. (id.). The PPA specifically authorizes USDA to hold, seize, quarantine, treat, apply other remedial measures to destroy or otherwise dispose of any plant, plant pest, noxious weed, biological control organism, plant product, article or means of conveyance that is moving (or has moved) into or through the U.S. or interstate, if USDA considers it necessary in order to prevent the dissemination of a plant pest or noxious weed that is new to or not known to be widely prevalent or distributed within or throughout the U.S (id. §414(a)). The PPA also authorizes USDA to order an owner, or an agent of the owner, of a plant, plant pest, noxious weed, biological control organism, plant product, article or means of conveyance to treat, destroy, or otherwise dispose of those items (id.).

R. The **Marine Protection, Research and Sanctuaries Act**[53] (MPRSA) of 1972, also called the Ocean Dumping Act, the MPRSA prohibits (1) the transportation of any material from the United States for the purpose of disposal in ocean waters without a permit; (2) the transportation of any material by U.S. agencies or by U.S. flagged vessels or aircraft for the purpose of disposal in ocean waters without a permit; and (3) any person from dumping, without a permit, any material transported from a location outside the United States into the U.S. territorial seas or into the contiguous zone, to the extent it may affect the territorial seas or the territory of the United States.

[53] http://www.fws.gov/laws/lawsdigest/marprot.html.

V. CANADIAN AUTHORITIES RELATIVE TO MARINE INVASIVE SPECIES

I. BRITISH COLUMBIA AUTHORITIES

- **Transport Canada**[54] – The Regulatory Services Section processes and tracks all Transport Canada marine legislation and houses the Canadian Marine Advisory Council (CMAC), a consultative body that advises the Department of Transport on:
    - development and acceptance of international conventions, regulations, codes, standards and recommendations;
    - development and implementation of national statutes, regulations, codes, standards, recommendations and procedures;
    - operations and services; and
    - other matters related to marine safety, marine services and marine pollution prevention.

- **British Columbia Ministry of Environment**[55] can designate and regulate alien species that pose a risk to the health or safety of people or the environment. Sections 6.4 and 6.5 of the Wildlife Act (Controlled Alien Species Regulation[56]) give the Minister of the Environment the authority to designate species as controlled alien species and to regulate these species.

- **Fisheries and Ocean Canada**[57] (DFO) is responsible for developing and implementing policies and programs in support of Canada's economic, ecological and scientific interests in oceans and inland waters, including providing environmentally sound marine services. DFO developed federal regulations to manage and control aquatic invasive species in Canada, including the National Code on Introductions and Transfers of Aquatic Organisms. The Minister of Fisheries and Oceans Canada has the responsibility to protect fish and their habitat under the Fisheries Act. DFO regulates the aquaculture industry in British Columbia (site licenses may be issued by the Ministry of Agriculture and Lands). The DFO Centre of Expertise for Aquatic Risk Assessment has completed risk assessments for key aquatic invasive species and in 2009 reviewed the Canadian Rapid Response Framework for Aquatic Invasive Species. DFO has also taken the lead on federal and provincial/territorial coordination through the National Aquatic Invasive Species Council (Canadian Council of Fisheries and Aquaculture Ministers).

- **Parks Canada Agency**[58] manages its system of national marine conservation areas.

[54] https://www.tc.gc.ca/eng/menu.htm.
[55] http://www2.gov.bc.ca/gov/content/governments/organizational-structure/ministries-organizations/ministries/environment.
[56] http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/94_2009.
[57] http://www.dfo-mpo.gc.ca/index-eng.htm.
[58] http://www.pc.gc.ca/eng/agen/index.aspx.

- **Environment Canada - Canadian Wildlife Service**[59] administers the Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (see below).

- **Canada Border Services Agency**[60] (CBSA) enforces the prohibition on the import, possession, transport and release of significant risk species, in specific geographic areas, and under specific conditions.

- The **Pest Management Regulatory Authority**[61] is responsible for pesticide regulation in Canada.

II. CANADIAN LAWS RELEVANT TO MARINE INVASIVE SPECIES

A. Canada's **Aquatic Invasive Species Regulations**[62] were adopted in 2015 and are intended to prevent the introduction and spread of aquatic invasive species in Canadian waters, avoid costs associated with the establishment of invasive species, support management activities to control the spread of aquatic invasives, and fill regulatory gaps, thereby ensuring a consistent national strategy for the management of aquatic invasives. The regulations address aquatic invasives by classifying them into three categories Note: These lists are expected to grow, and DFO is developing policy for new listings (as of September 2015):
    - 89 species subject to specific prohibitions in specific areas and under specific conditions. These species are also subject to the general prohibition against unauthorized introduction anywhere they are not indigenous (Note: Most of the species on this list were the ON and MB lists that were grandfathered. Other species include Asian carp and dreissenids).
    - 14 species that may represent risk in all or certain parts of Canada, and are not subject to specific geographic prohibitions or prohibitions against import, transport, possession or release (also known as the Control List)
    - Other non-listed aquatic species that are subject to general prohibition against unauthorized introduction anywhere they are not indigenous.

B. Canada's **Ballast Water Control and Management**[63] regulations, included in the Shipping Act (see section C below) are harmonized to the maximum extent possible with current U.S. and international provisions, including the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004.

C. **Canadian Shipping Act**[64] **-** Transport Canada administers and enforces Canada's program for managing ballast water. This Act requires all vessel operators entering Canadian waters from outside the Canadian Economic Exclusion Zone (EEZ) to exchange ballast water at least 200 nautical miles o [illegible] less 2,000 meters deep. Vessels entering Canadian waters from within the 200 mile EEZ

[59] http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=5F569149-1.
[60] http://www.cbsa-asfc.gc.ca/menu-eng.html.
[61] http://www.hc-sc.gc.ca/ahc-asc/branch-dirgen/pmra-arla/index-eng.php.
[62] http://canadagazette.gc.ca/rp-pr/p2/2015/2015-06-17/html/sor-dors121-eng.php.
[63] http://laws-lois.justice.gc.ca/eng/regulations/SOR-2011-237/.
[64] https://www.tc.gc.ca/eng/acts-regulations/acts-2001c26.htm.

must exchange ballast water at least 50 miles o shore in wa
ballast water north of latitude 42° 50′ are exempt from exchange requirements. Vessel masters may claim safety exemptions. The Act adopts ballast water discharge standards proposed by the IMO. With this exception, the Act is consistent with other West Coast state programs.

D. The **Canada Marine Act**[65] (1998) is intended to provide for a high level of marine transportation safety and environmental protection

E. **National Code on Introductions and Transfers of Aquatic Organisms**[66] sets standards for assessing introductions and transfers of aquatic organisms, including a risk assessment process that can be applied to introductions and transfers of new aquatic organisms between and within regions and jurisdictions. Federal/Provincial or Territory Committees exist to set these standards.

F. The **Canada National Marine Conservation Areas Act**[67] prohibits the disposal of any substance in waters within a marine conservation area except as authorized by a permit.

G. The **Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act** mandates possession of a permit to import plant and animal species that are listed in schedules to the Wild Animal and Plant Trade Regulations. The schedules include all species regulated by CITES as well as invasive species.

H. The **Integrated Pest Management Act** regulates herbicide applications that may be used to control invasive plant infestations.

I. The **Fisheries Act**[68] , one of Canada's first laws in 1868, seeks to provide for the sustainability and ongoing productivity of commercial, recreational and Aboriginal fisheries, and recognizes the threat of aquatic invasive species to fish through competition, predation or habitat impacts. Paragraphs 43(1)(n) and (o) and Subsections 43(2) to (4) provide for the development of a list of aquatic invasive species and of regulations to control aquatic invasive species. Through this Act, Fisheries and Ocean Canada regulates the aquaculture industry to protect fish and fish habitat.

J. The **Aquaculture Activities Regulations**[69] clarify conditions under which aquaculture operators may treat their fish for disease and parasites, as well as deposit organic matter, under sections 35 and 36 of the Fisheries Act.

[65] http://laws-lois.justice.gc.ca/eng/acts/c-6.7/.
[66] http://www.dfo-mpo.gc.ca/science/environmental-environnement/ais-eae/code-eng.htm.
[67] http://laws-lois.justice.gc.ca/eng/acts/c-7.3/page-6.html#h-7.
[68] http://laws-lois.justice.gc.ca/eng/acts/f-14/.
[69] http://www.dfo-mpo.gc.ca/aquaculture/management-gestion/aar-raa-eng.htm.

K. The **Species at Risk Act** (SARA)[70] is intended to prevent wildlife species in Canada from disappearing, to provide for the recovery of wildlife species that are extirpated, endangered, or threatened as a result of human activity, and to manage species of special concern to prevent them from becoming endangered or threatened.

III. PROVINCIAL LAWS RELEVANT TO MARINE INVASIVE SPECIES

A. The **British Columbia Wildlife Act**[71] – Controlled Alien Species Regulation controls the possession, breeding, shipping and releasing of alien animals that pose a risk to the health or safety of people of the environment. Section 6.4 and 6.5 of the Wildlife Act allow the Ministry of the Environment to designate and regulate alien species.

[70] https://www.ec.gc.ca/alef-ewe/default.asp?lang=en&n=ED2FFC37-1

[71] http://www.env.gov.bc.ca/fw/wildlifeactreview/cas/.

VI. STATE LAWS, AUTHORITIES, ROLES AND RESPONSIBILITIES

A. CALIFORNIA[72]

I. SUMMARY OF CALIFORNIA MARINE INVASIVE SPECIES AUTHORITIES

The primary authority for state efforts to prevent AIS introduction and manage the spread and impacts of AIS in state waters is described in California's Fish and Game Code, the Food and Agriculture Code, the Public Resources Code, the California Water Code, and the Harbors and Navigation Code.

The seven state agencies with lead AIS responsibilities are:

- **California State Lands Commission** (SLC) – SLC is the lead implementing agency for California's Marine Invasive Species Program, implementing state statute and regulations that require vessels arriving at California ports to manage their ballast water and biofouling. SLC oversees the prevention of AIS introductions through commercial shipping as directed by the Ballast Water Management and Control of Nonindigenous Species Act, Marine Invasive Species Act, and the Coastal Ecosystems Protection Act. The SLC has developed and implemented various regulations through the authority granted in these acts.

- **California Department of Fish and Wildlife** (CDFW) – CDFW, through its Invasive Species Program, is the coordinating agency for statewide AIS activities. CDFW enforces regulations concerning: the aquaculture industry; recreational fishing; commercial fishing; the importation and transport of live wild animals, aquatic plants and fish into the state; and the placement of any such animals in state waters. The CDFW's Office of Spill Prevention and Response (OSPR) is responsible, under the California MISP, for conducting biological surveys to assess the amount and types of AIS present in state waters.

- **California Department of Boating and Waterways** (DBW) – DBW is the lead agency to cooperate with other state, local and federal agencies in controlling water hyacinth and *Egeria densa* in the Sacramento-San Joaquin Delta, its tributaries, and the Suisun Marsh.

- **California Department of Water Resources** (DWR) - DWR addresses invasive species issues that impact water supply and delivery and flood control. Recent management activities have focused largely on monitoring AIS within the water column and food web, developing key early detection programs and undertaking structural improvements such as a barrier at Lake Davis (to prevent northern pike escape) and a screen at the State Water Project (to collect Chinese mitten crabs). In terms of monitoring, DWR conducts monthly monitoring of benthic (bottom-dwelling) invertebrates, zooplankton and phytoplankton throughout the upper San Francisco Estuary. DWR also documents the distribution of the invasive algal species *Microcystis* spp. (both toxic and non-toxic strains) in this estuarine region. DWR is also investigating the impacts of the Chinese mitten crab on the benthic

[72] The majority of the information included in this section was extracted from the 2008 California Aquatic Invasive Species Management Plan.

invertebrate community in the Sacramento-San Joaquin Delta. DWR controls invasive *Spartina*.

- **State Coastal Conservancy** (SCC) – The SCC controls and eradicates aquatic invasives, including administering the Invasive Spartina Project in San Francisco Bay.

- **State Water Resources Control Board** (Water Board) - AIS are within the purview of the SWRCB as part of the state's responsibilities under the federal Clean Water Act. A 2005 federal court ruling defined nonindigenous species as "pollutants" present in discharges from vessels and found that such discharges are not exempt from permitting requirements. The Water Board is also a partner agency, along with CDFW/OSPR, BOE, and SLC, for the State's Marine Invasive Species Program. In this capacity, the Water Board consults on vessel vector management issues that may impact water quality.

- **Nine regional water quality control boards** (RQWCBs) - Some of the regional water quality control boards in California have also sought to place specific water bodies within their regions on the CWA's 303(d) list, as impaired by "exotics." San Francisco Bay was listed in 1998. In 2006, the State Board also listed the Delta, the upper San Joaquin River and the Cosumnes River. Once on the 303(d) list, the regional boards are required to develop discharger/source based programs for managing pollutant loads.

II. CALIFORNIA LAWS AND REGULATIONS

- **Fish and Game Code & Title 14 of the California Code of Regulations**[73]—At least five code sections and their associated regulations address or relate to AIS. The intent of these code sections are to regulate the importation and transportation of live wild animals and plants; restrict the placement of live aquatic animals or plants in state waters; and regulate the operation of aquaculture industries. CDFW is the state agency responsible for implementing these statutes. F & G Code §§ 2080–2089, 2118, 2270-2272, 2300, 6400-6403,15000 et seq.

- **California Food and Agriculture Code**[74]—More than 30 different code sections address the state's mandates to prevent the introduction and spread of injurious animal pests, plant diseases and noxious weeds. These codes describe procedures and regulations concerning, among other things: plant quarantines; emergency pest eradications to protect agriculture; pests as public nuisances; vectors of infestation and infection; the sale, transport and propagation of noxious weeds; and the protection of native species and forests from weeds. Most of these statutes and their associated regulations (Title 3 of the California Code of Regulations) are enforced by DFA. F & A Code §§ 403, 461, 5004, 5021-5027, 5301-5310, 5321-5323, 5401-54204, 5421, 5430- 5432, 5434, 5761-5763, 7201, 7206-7, 7501-2.

[73] http://www.fgc.ca.gov/html/regs.html.
[74] www.leginfo.ca.gov.

- **California Water Code**[75]—The Porter-Cologne Water Quality Control Act (California Water Code, Division 7) lists a number of types of pollutants that are subject to regulation. Section 13050, for example, specifically includes the regulation of "biological" pollutants by defining them as relevant characteristics of water quality subject to regulation by the SWRCB and the affiliated RWQCBs. AIS are an example of this kind of pollutant if they are discharged to receiving waters. The Water Code generally regulates more substances occurring in discharges and also defines discharges to receiving waters more broadly than the federal CWA. Water Code §13050 46.

- **Harbors & Navigation Code**[76]—This code authorizes DBW to manage aquatic weeds impeding navigation and use of state waterways. Article 2, Section 64.

- **Public Resources Code**[77]—Sections of this code address the state's mandates to prevent nonindigenous species introductions through ballast water and biofouling of commercial vessels. These sections were promulgated by the three laws described below. The SLC and CDFW, and the Water Board have primary responsibility for carrying out these statutes and associated regulations. PRC sections 71200 et seq.

- The **Ballast Water Management for Control of Nonindigenous Species Act**[78] of 1999 required that commercial vessels over 300 gross register tons (GRT) originating from outside the U.S. EEZ carry out mid-ocean exchange (at least 200 nautical miles offshore) or use an approved ballast water treatment method, before discharging in California state waters. State enforcement of the act took the form of monitoring ballast discharges and reports, inspecting vessels for compliance and assessing vessel reporting rates and compliance. The Act established the Marine Invasive Species Program.

- The **Marine Invasive Species Act**[79], passed into law in 2003, requires ballast water management for all vessels that intend to discharge ballast water in California waters. All qualifying vessels coming from ports within the Pacific Coast region must conduct an exchange (in waters at least 50 nautical miles offshore and 200 meters deep), or retain all ballast water and associated sediments. All vessels must complete and submit a ballast water report form upon departure from each port of call in California. They must also comply with good housekeeping practices, ranging from avoiding discharge near marine sanctuaries to rinsing anchors and removing fouling organisms from the hull. They must also keep logs of ballast management activities, conduct crew training and pay a fee for each qualifying voyage at their first port of call in California. To determine the effectiveness of the management provisions of the act, the legislation also requires state agencies to conduct a series of biological surveys to monitor new introductions to coastal and estuarine waters.

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[75] http://www.leginfo.ca.gov/.html/wat_table_of_contents.html.
[76] http://www.leginfo.ca.gov/cgi-bin/displaycode?section=hnc&group=00001-01000&file=60-64.7.
[77] http://www.leginfo.ca.gov/.html/prc_table_of_contents.html.
[78] http://www.ecfr.gov/cgi-bin/text-idx?rgn=div6;node=33%3A2.0.1.5.21.4.
[79] http://codes.lp.findlaw.com/cacode/PRC/1/d36.

- In 2006, the **California Coastal Ecosystems Protection Act**[80] established performance standards for the discharge of ballast water with an associated implementation schedule. The Act also required the SLC to prepare reports assessing the efficacy, availability and environmental impacts, including impacts on water quality, of currently available ballast water treatment technologies. The implementation of this Act is being phased in (i.e., standards apply to new vessels in all size classes and all vessels 1,500–5,000 metric tons constructed after January 1, 2016, and standards apply to all other vessels less than 1,500 metric ton and more than 5,000 metric tons after January 1, 2018). As California, the U.S. Federal government, and the International Maritime Organization (IMO) move towards the implementation of ballast water discharge performance standards, vessel owners are beginning to install ballast water treatment technologies onboard their ships (e.g., since 2012, 58 vessels arrived at California ports reporting having installed ballast water treatment systems onboard).[81]

- In 2007, the Governor of California signed Assembly Bill 740, which provided the SLC with a mandate to develop regulations for managing vessel biofouling. The SLC is in the midst of the rulemaking process to adopt these regulations. The bill also provided the Commission with authority to adopt a form to collect information on vessel hull husbandry practices.

In addition, the national marine sanctuaries offshore of California have regulations prohibiting the introduction of non-native or invasive species. Specifically, the sanctuary may prohibit activities that promote invasive species within the sanctuaries and take appropriate actions to remove them and mitigate their impacts.

B. WASHINGTON[82]

I. SUMMARY OF WASHINGTON MARINE INVASIVE SPECIES AUTHORITIES

- The Washington **Department of Fish & Wildlife** (WDFW) is the lead agency for managing invasive species, excluding pests managed by the Departments of Agriculture and Forestry, and excluding shellfish sanitation managed by the Department of Health. Authorities include:
    - developing and implementing integrated invasive species management actions and programs (including rapid response (Section 108), early detection and monitoring, prevention, containment, control, eradication, and enforcement);
    - aligning management classifications, standards, and enforcement provisions by rule;
    - managing invasive species to support preservation of native species and protection of threatened or endangered species;
    - participating in local, state, regional, national, and international invasive species efforts;

[80] http://www.slc.ca.gov/Info/Reports/MISP_TechRpts/2013.pdf.
[81] Dobroski, N. C. Brown, R. Nedelcheva, C. Scianni, and J. Thompson. 2015. 2015 biennial report on the California Marine Invasive Species Program. California State Lands Commission. 109pp.
[82] The majority of information in the section of the document on Washington authorities and laws was derived from State of Washington websites and reports.

- providing technical assistance; entering into partnerships, cooperative agreements, and state or interstate compacts;
- researching and developing invasive species management tools;
- posting signs and information at port districts, privately or publicly owned marinas, state parks, and all boat launches owned or leased by state agencies or political subdivisions;
- declaring a quarantine against a water body, property, or region within the state to protect from the threat of a prohibited level 1 or level 2 species (Section 107); Section 110 provides consultation and cooperation authorities with jurisdictions outside the state (e.g., federal, tribal, Canadian);
- requesting the Governor to order emergency measures to prevent or abate prohibited Level 1 or 2 species that seriously endanger or threaten the state (RCW 43.06.010(14));
- inspecting watercraft for the presence of AIS when check stations are posted as open (RCW 77.135.120)[83]. and
- adopting rules as needed.

In addition, the department may delegated selected and identified elements of its authorities and duties to another agency of the state.

- WDFW activities in support of marine invasive species:
  - WDFW prepared a statewide Aquatic Nuisance Species Management Plan to respond to imminent threats of aquatic nuisance species to Washington waters under NISA.
  - WDFW administers a ballast water management program and implements treatment standards for ballast water discharged to state waters.
  - WDFW (WDFW Aquatic Invasive Species (AIS) Unit) developed an Invasive Tunicate Species Management Program.[84]
- WDFW coordinates the statewide Aquatic Nuisance Species Coordinating Committee, which seeks to minimize the unauthorized or accidental introduction of non-native aquatic species and control the spread of aquatic nuisance species established in the state.
- WDFW issued invasive species management protocols for marine and estuarine ecosystems – Level 1 decontamination is required when moving from one water body to another, regardless if in the same WDFW marine area. Level 2 decontamination is required whenever equipment is transported between major oceanographic basins, when moving from known infested waters, or before entering protected or highly sensitive areas.

- **Washington State Patrol** (WSP) co-manages the Aquatic Invasive Species (AIS) prevention and Enforcement Program with the Fish and Enforcement Divisions of the WDFW with authority to regulate at Port of Entry Weight stations as well as ex-officio enforcement of aquatic nuisance species (RCW 43.43.400).

[83] http://app.leg.wa.gov/rcw/default.aspx?cite=77.135.120
[84] http://wdfw.wa.gov/ais/tunicates.html

- **Washington Department of Ecology (WDE)**, in coordination with the Washington Department of Fish and Wildlife, regulates in-water hull cleaning to prevent the introduction of non-indigenous species or release of associated water quality pollutants. WDE issues water quality permits and approve local shoreline master programs for shellfish aquaculture.[85]

- The **Washington State Department of Agriculture** (WSDA) protects the state's natural resources, agriculture industry, and the public from selected plan and animal diseases and pests. The WSDA is the lead agency for the control of *Spartina*, including coordination of control, preparation of a statewide management plan, directing on-the-ground control efforts, and evaluating control effectiveness.
    - The Washington State Noxious Weed Control Board advised the WSDA about noxious weed control in Washington State, and works with British Columbia and neighboring states on regional noxious week projects (i.e., *Spartina*).

- The **Washington Invasive Species Council**[86] was established in 2006[87], and extended in 2011. The Council is tasked with providing policy level direction, planning and coordination for combating invasive species statewide as well as preventing introductions of potentially harmful species.

[85] http://www.ecy.wa.gov/programs/sea/aquaculture/shellfish.html
[86] http://www.invasivespecies.wa.gov/
[87] http://www.invasivespecies.wa.gov/documents/Final_Bill.pdf

- **Revised Code of Washington**

  - **RCW 17.26.015 – Designates the Department of Agriculture as the lead agency** for Spartina.

  - **RCW 77**
    - **RCW 77.135[88] – Invasive Species –** Sections 010-180 provide for all activities associated with invasive species prevention and control efforts in the state.

    - **Establishes an aquatic invasive species prevention account** to implement provisions of 77.135 RCW (**77.12.879**).

    - **RCW 77.115 – Private sector aquaculture operations**

    - **Prohibited aquatic animal species – infested state waters** (77.12.875).

    - **Ballast Water** (Chapter 77.120 RCW[89] - statute).

  - **RCW 43.43 – Aquatic Invasive Species Enforcement Account – Aquatic Invasive Species Enforcement Program for Recreational and Commercial Watercraft** – gives authority to Washington State Patrol to regulate at Port of Entry Weight Stations and enforce aquatic nuisance species laws.

- **Washington Administrative Code**
  Fisheries (Title 220)
  - **WAC 220-12-090 – Non-native aquatic animal species**
    - Prohibited aquatic animal species[90] are species that have a high risk of becoming an invasive species and may not be possessed, imported, purchased, sold, propagated, transported, or released into state waters except as provided in RCW 77.15.253[91] – RCW 77.120.020.
    - Regulated aquatic animal species[92] have some beneficial use with a moderate, but manageable risk of becoming invasive, and may not be released into state waters except as provided in RCW 77.15.253. Species include commercial aquaculture species and food fish or game fish.

[88] http://apps.leg.wa.gov/rcw/default.aspx?cite=77.135
[89] http://apps.leg.wa.gov/RCW/default.aspx?cite=77.120.
[90] http://wdfw.wa.gov/ais/wac.html.
[91] http://apps.leg.wa.gov/rcw/dispo.aspx?cite=77.15.253.
[92] http://wdfw.wa.gov/ais/wac.html#2.

- Unlisted invasive species are neither prohibited nor regulated, but are of concern and deemed highly threatening. The majority of the species on this list include marine aquatic invasives (primarily tunicates).

- **WAC 220-77-040**[93] **– Shellfish aquaculture disease control –** makes it unlawful to import into Washington or possess live imported aquatic invertebrates, except market ready shellfish, without first obtaining a permit.

- **WAC 220-77-060**[94] **– Marine plant aquaculture disease control** – makes it unlawful or any person to import into Washington marine plant aquaculture products with first obtaining a permit.

- **WAC 220-77-065**[95] **– Kelp importation –** Makes it unlawful for any person to import kelp into Washington for use in the herring spawn on kelp fishery without first obtaining a permit.

- **WAC 220-150**[96] **– Ballast Water Management –** Provides definitions, reporting and recordkeeping requirements, authority for vessel inspections, open sea exchange requirements and alternatives, treatment requirements and notifications, ballast tank sediment, and penalties and enforcement.

Wildlife (Title 232)

- **WAC 232-12-016**[97] **– Nonnative aquatic species** – Provisions apply to nonnative aquatic species except in ballast water.
  - Unlisted nonnative aquatic animal species must be reviewed and designated for classification by the commission as either regulated aquatic animal species or unregulated aquatic animal species prior to approval for release into state waters.
  - Includes provisions that apply to prohibited aquatic animal species.
  - Includes provisions for bodies of water infested with invasive aquatic plans or prohibited aquatic animal species.
  - States it is unlawful to fail to comply with listed provisions regarding aquaculture and waters containing prohibited aquatic animal species or invasive aquatic plant species.
  - Sections 5 and 6 provide provisions for violations punishable under 77.15.253 and 77.15.290.
- **WAC 232-12-01701 – Aquatic nuisance species**
  - Designates deleterious exotic wildlife and aquatic nuisance species.
  - Makes it unlawful to intentionally import into Washington or possess ANS.

[93] http://apps.leg.wa.gov/wac/default.aspx?cite=220-77-040
[94] http://apps.leg.wa.gov/wac/default.aspx?cite=220-77-060
[95] http://apps.leg.wa.gov/wac/default.aspx?cite=220-77-065
[96] http://apps.leg.wa.gov/wac/default.aspx?cite=220-150
[97] http://apps.leg.wa.gov/wac/default.aspx?cite=232-12-016

- Makes it unlawful to import live aquatic zebra mussels for release into state waters from any state or Canadian province east of the Continental Divide without accompanying by a zebra mussel-free certificate.
- Gives authority to the WDFW director to authorize a person to possess ANS for research.
- Gives authority to the WDFW director to authorize person working with the scope and supervision of a department-sponsored monitoring and control program to capture, possess, and destroy ANS.
- Gives authority to WDFW to take action to prevent or abate introduce ANS as a public nuisance, including charging the possessor of ANS for the control action.

C. OREGON

I. SUMMARY OF OREGON MARINE INVASIVE SPECIES AUTHORITIES

- The **Oregon Department of Fish and Wildlife**[98] – through Oregon Administrativ Rule (OAR) Chapter 635, regulates specific non-native wildlife species use. Species listed are classified into one of four groups: exempt, prohibited, controlled, or noncontrolled. The Oregon Department of Fish and Wildlife's Marine Resources Program has taken the lead on management of invasive species as they come ashore (i.e., marine debris). ODFW has the authority to require recreational and commercial watercraft to stop at check stations for the purpose of inspecting the watercraft for the presence of aquatic species, and can decontaminate or recommend decontamination of these watercraft.

- The **Oregon State Police Fish and Wildlife Division**[99] ensures compliance with the laws and regulations that protect and enhance the long-term health and equitable use of Oregon's fish and wildlife resources.

- The **Oregon Department of Environmental Quality**[100] (DEQ), through ORS 783.620-992OAR Chapter 340, protects the waters of the state from ANS by establishing procedures for the proper reporting and management of ballast water discharges, including vessel inspections, compliance verification, and enforcement authorities. The Oregon Ballast Water Program is implemented by DEQ via OAR 340 Division 143; Modifications to the program have been guided by the legislatively established Task Force on Shipping Transport of Aquatic Invasive Species, which has also been charged with evaluating vessel biofouling management concerns in the state. DEQ serves with the Oregon Parks and Recreation Department as lead agencies for Oregon's marine debris cleanup efforts.

- The **Oregon Department of Agriculture**[101], through Chapter 603 and its Plant Division, works to exclude, detect and control or eradicate serious insect pests and plant diseases; to enhance the agricultural value of nursery stock; and to oversee statewide noxious weed control efforts. ODA has the authority to require recreational and commercial watercraft to stop at check stations for the purpose of inspecting the watercraft for the presence of aquatic invasive species, and can decontaminate or recommend decontamination of these watercraft.

- The **Oregon Parks and Recreation Department**[102] serves, along with the Oregon Department of Environmental Quality, as lead agencies for Oregon's marine debris cleanup efforts.

[98] http://www.dfw.state.or.us/.
[99] http://www.oregon.gov/osp/FW/pages/index.aspx.
[100] http://www.oregon.gov/deq/pages/index.aspx.
[101] http://www.oregon.gov/oda/Pages/default.aspx.
[102] http://www.oregon.gov/OPRD/PARKS/pages/tsunami_debris.aspx.

- The **Oregon State Marine Board**[103] has the authority to require recreational and commercial watercraft to stop at check stations for the purpose of inspecting the watercraft for the presence of aquatic species, and can decontaminate or recommend decontamination of these watercraft.

- The **Oregon Department of State Lands**[104] has the authority to make the determination that it is impossible to move a shipwreck into dry dock before dismantling.

- The **Oregon Invasive Species Council** (ORS.570.750)[105] conducts a coordinated and comprehensive effort to keep invasive species out of Oregon and to eliminate, reduce, or mitigate the impacts of invasive species already in the state.

II. OREGON LAWS AND REGULATIONS

- **Importation, possession, confinement, transportation and sale of nonnative wildlife**[106] (Division 56), are intended to protect Oregon's native wildlife by regulating actions involving nonnative wildlife and allowing private use or ownership of nonnative species if they do not pose a significant risk of harm to native species.
    - **Animals Exempt from These Rules** (635-056-0020) omit a list of species subject to the rules because they are not wild species.
    - **Requirements for Importation and Possession of Live Wildlife** (635-056-0040) sets the standards for when permits would be issued for prohibited and (635-056-0070) for controlled species.

- **Ballast Water Management**[107] **-** 783.620-640 authorizes the Environmental Quality Commission to adopt ballast water management rules and prohibits the discharge of ballast water unless specified management actions or exemption criteria are met. In addition, ORS 783 establishes the state Task Force on Shipping Transport of Aquatic Species.
    - OAR 340-143-0001 – Authority, Purpose, Scope
    - OAR 340-143-0010 – Discharge Prohibitions and Management Requirements
    - OAR 340-143-0020 – Reporting and Recordkeeping
    - OAR 340-143-0030 – Vessel Inspections
    - OAR 340-143-0040 – Emergency Management Alternatives
    - OAR 340-143-0050 – Use of Ballast Water Treatment Systems
    - OAR 340-143-0060 – Ballast Tank Sediment Management
    - ORS 783.990-992 (and OAR 340-12-0083) – Penalties and Enforcement

[103] http://www.oregon.gov/OSMB/pages/index.aspx.
[104] http://www.oregon.gov/dsl/pages/index.aspx.
[105] https://www.oregonlegislature.gov/bills_laws/lawsstatutes/2013ors570.html
[106] http://www.dfw.state.or.us/OARs/56.pdf.
[107] http://arcweb.sos.state.or.us/pages/rules/oars_300/oar_340/340_143.html.

- **Hull Fouling - Shipbreaking** (783.400) can occur only in dry dock areas with special exceptions when the Department of State Lands determines that it is impossible to move the shipwreck into dry dock.

- **Aquatic Invasive Species Prevention Program:**
    - **Oregon State Marine Board Aquatic Invasive Species Prevention Program Rules**:
        - 830.560 – Launching boat with aquatic invasive species prohibited
        - 830.565 – Boat permit required
        - 830.570 – Board to issue permit fees
        - 830.575 – Fees for permit
        - 830.580 – Rules; contracting services
        - 830.585 – Aquatic Invasive Species Prevention Fund
        - **Watercraft inspection stations** – ORS830.589 gives authority to ODFW, the State Marine Board and ODA to require a person operating or transporting a recreational or commercial watercraft to stop at a check station for the purpose of inspecting the watercraft for aquatic species. The regulation also gives these agencies the authority to decontaminate or recommendation decontamination of these types of watercraft.
        - 250-010-0660 – Oregon Marine Board Rules for Watercraft Inspection Stations

    - **Oregon Department of Fish and Wildlife Aquatic Invasive Species Prevention Permit Rules**:
        - 635-059-0000 – Purpose and General Information
        - 635-059-0010 – Aquatic Invasive Species Reporting Information
        - 635-059-0050 – Allowable Blind Material for boats

    - **Oregon Marine Board Aquatic Invasive Species Prevention Permit Statutes**:
        - 830.589 – Watercraft check stations
        - 830.594 – Report of prevention efforts
        - 830.998-9 – Penalty for failing to stop at an aquatic invasive species check station; penalty for transporting aquatic invasive species

I. SUMMARY OF HAWAII MARINE INVASIVE SPECIES AUTHORITIES

- The **Hawaii Department of Agriculture** (HDOA) is the lead state agency in protecting Hawaii's agricultural and horticultural industries, animal and public health, natural resources, and environment from the introduction of invasive species.[108] To accomplish this, the HDOA has charged the **Plant Quarantine Branch** (PQB) with being the "first line of defense" against pests entering Hawaii by regulating the intentional importation of all living organisms, including marine species, to Hawaii. PQB maintains lists of approved, restricted, or prohibited species.[109] New non-indigenous species may be intentionally imported to Hawaii, subject to a review of risks and benefits of introduction. Such proposals are reviewed by a technical advisory committee on the basis of biological and ecological interactions, diseases, life cycle analysis, control and eradication measures, and other specific criteria.[110]

- The **Hawaii Department of Land and Natural Resources**[111] (DLNR), led by an executive Board of Land and Natural Resources, is responsible for managing, administering, and exercising control over all public lands, water resources, ocean waters, navigable streams, and coastal areas. The DLNR administers all marine resources within three miles of land through the activities of various divisions, and is the lead state agency for preventing introductions of invasive species through ballast water and hull fouling. DLNR ensures enforcement of relevant laws on department-managed lands and on marine waters. DLNR has overlapping responsibility with other state and federal agencies.
    - The **Division of Boating and Ocean Recreation (DOBOR)**[112] regulates small boat harbors.
    - The **Office of Conservation and Coastal Lands**[113] (OCCL) oversees 2 million acres of private and public submerged lands within the State Land Use Conservation District. In addition, the Office is responsible for overseeing beach and marine lands out to the seaward extent of the State's jurisdiction.

- The **Division of Aquatic Resources**[114] (DAR) is one of 11 divisions within the DLNR. DLNR is legislatively authorized to administer the aquatic resources of the state. DAR is responsible for managing the state's marine and freshwater resources through various programs, including the Aquatic Invasive Species (AIS) program.[115] The AIS program works to control, manage, and prevent introduced pests in marine and inland waters of Hawaii by focusing on invasive algae control, marine debris rapid response, and ballast water/biofouling management. DAR's jurisdiction includes all waters within three

[108] http://hdoa.hawaii.gov/
[109] Olin, P. 1993. Importing live organisms to Hawaii, procedures and permitting. Fact sheet No. 1/November 1998. University of Hawaii Sea Grant Extension Service, Honolulu, Hawaii.
[110] Ibid.
[111] http://dlnr.hawaii.gov/.
[112] http://dlnr.hawaii.gov/dobor/rules/.
[113] http://dlnr.hawaii.gov/occl/.
[114] http://dlnr.hawaii.gov/dar/.
[115] http://dlnr.hawaii.gov/ais/

nautical miles of the Main Hawaiian Islands as well as geographically designated Marine Managed Areas, with the exception of waters around the island of Kaho'olawe, which are administered by the **Kahoolawe Island Reserve Commission**[116] (KIRC). DAR leads the Aquatic Invasive Species Response Team, provides support to the Aquatic Invasive Species Management Plan, and assists the Alien Aquatic Organism Task Force.

- The **Hawaii Department of Transportation – Harbors Division (HDOT-H)**[117] administers Hawaii's 10 commercial ports and oversees major harbor activities including vessel maintenance, repairs, and in-water cleaning.

- The mission of the Hawaii **Department of Health (DOH)** is to monitor, promote, protect, and enhance the health and environmental well-being of all of Hawaii's people. Aquatic invasive species issues primarily fall under the **Environmental Management Division - Clean Water Branch(CWB).**[118] The CWB administers and enforces statewide water pollution laws and rules, as well as the state's responsibilities under the federal Clean Water Act through permitting of point sources, compliance monitoring, inspections, investigations of complaints, ambient water quality monitoring, and public education. EPA's 2013 Vessel General Permit is also administered by the CWB.

- The **Hawaii Invasive Species Council**[119] **(HISC)** is an inter-departmental collaboration comprised of the **Departments of Land & Natural Resources (DLNR), Agriculture (DOA), Health (DOH), Transportation (DOT), Business, Economic Development & Tourism (DBEDT),** and the **University of Hawaii (UH).** Established in 2003 by Hawaii's State Legislature (HRS Chapter 194),[120] the HISC was created to provide policy level direction, coordination and planning among state departments, federal agencies and international and local initiatives for the control and eradication of harmful invasive species infestations and to prevent the introduction of other potentially harmful invasive species.

Other entities:

- The **Alien Aquatic Organism Task Force** was established to address ballast water and hull fouling issues in Hawaii. Comprised of members from federal government, state government, industry, non-governmental agencies, and the scientific community, the responsibility of the task force is to develop a comprehensive plan to prevent the introduction and dispersal of alien aquatic organisms in ballast water and on the hulls of vessels into state marine waters.

[116] http://kahoolawe.hawaii.gov/.
[117] http://hidot.hawaii.gov/harbors/.
[118] http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/contact-us/.
[119] http://dlnr.hawaii.gov/hisc/about/.
[120] http://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0194/HRS_0194-.htm.

- The **Aquatic Invasive Species Response Team**, led by DAR and often in partnership with other agencies, universities, and organizations, conducts: hull fouling surveys, AIS control activities, marine debris response, and maps the distribution of invasive algae statewide.

- The **Coordinating Group on Alien Pest Species** (CGAPS) is a voluntary partnership of federal and state agencies and non-governmental organizations whose goal is to protect Hawaii from invasive species.[121] CGAPS works to bring agencies and organizations together to close the gaps in Hawaii's invasive species programs in the areas of prevention, early detection/rapid response, and long-term control of harmful terrestrial and aquatic invasive species through coordination, planning, and management.

- Hawaiian Ecosystems at Risk (HEAR), Biological Resources Division, USGS HEAR is a project that provides technology, methods, and other information to decision makers, managers, and the public about effective management of invasive species in Hawai`i. It maintains a website with several databases and links to other resources.529 HEAR works in partnership with federal and state agencies, as well as non-governmental organizations.

- Invasive Species Committees for Island-Based Rapid Response Invasive species committees are voluntary partnerships that work to prevent, eradicate, and control priority invasive species that threaten intact public and private conservation lands. These committees, however, are primarily terrestrial in focus.

II. HAWAII LAWS AND REGULATIONS

Hawaii is one of the most isolated archipelagos in the world and its history of anthropogenic marine introductions over time has fundamentally changed the islands' ecology. To address the growing threat of AIS introductions, the legislature granted DLNR rulemaking authority for ballast water discharges and hull fouling organisms. Hawaii's administrative rules relative to ballast water require updates to conform with the current IMO and USCG rules, and to address policy gaps, such as the inter-island vessel exemption. Ballast water management rules in Hawaii will be reviewed in 2015-2016 to address compliance for unmanaged ballast water, re-assess rules and proposed amendments, and address management gaps and opportunities.

Currently, no hull/biofouling regulations exist at the state level, even though up to 78% of Hawaiian introductions of invasive species occur through vessel biofouling – making it the top ranking vector for non-indigenous and cryptogenic marine introductions into the state.[122] Hawaii is considering taking steps to require mandatory biofouling, and develop an intra-state movement vessel biofouling policy.

- **Alien aquatic organisms**[123] (Hawaii Revised Statutes (HRS) § 187A-32) - The DLNR is designated as the lead state agency for preventing the introduction of alien aquatic organisms through the regulation of

[121] http://www.cgaps.org/
[122] http://www.cgaps.org/wp-content/uploads/Hawaii-Biofouling-Report-2014-FINAL.pdf
[123] http://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0187A/HRS_0187A-0032.htm.

ballast water discharges and hull fouling organisms. This statute also authorizes the Governor of Hawaii to engage in an agreement with the US Secretary of Transportation to implement the law.

- **Non-indigenous Aquatic Species**[124] (Hawaii Administrative Rules (HAR) Chapter 13-76, Subtitle 4, Chapter 76) provides the rules aimed at preventing the introduction and spread of nonindigenous aquatic species into state waters. Subchapter 2 addresses ballast water management.

- **Release and confiscation of harmful aquatic life**[125] (HRS § 187A-6.5) prohibits the release of any live non-native fish or other live non-native aquatic life held in an aquarium or other confinement into waters of the state, with some exception provisions.

- **Introduction of aquatic life and wildlife**[126] (HRS § 197-3) prohibits the introduction of aquatic life and wildlife by the department into any habitat within the state unless the introduction is recommended by the department and pursuant to Chapter 91.

- **Plant and Non-Domestic Animal Quarantine**[127] (HRS Chapter 150A) authorizes HDOA to promulgate rules regarding the importation of plants, non-domestic animals, and microorganisms into Hawaii. HAR Chapters 4-70 to 4-73 establishes the administrative rules for this statute.

- **Hawaii Invasive Species Council**[128] (HRS Chapter 194) created the Hawaii Invasive Species Council, describing the designation of a lead agency and their authority/accountability.

- **Water Quality Standards**[129] (HAR Chapter 11-54, Title 11, Chapter 54) establishes basic water quality standards applicable to all waters. All waters shall be free of substances or conditions in concentrations which produce undesirable aquatic life.

[124] http://dlnr.hawaii.gov/dar/files/2014/05/ch76.pdf.
[125] http://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0187A/HRS_0187A-0006_0005.htm.
[126] http://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0197/HRS_0197-0003.htm.
[127] http://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0150A/HRS_0150A-.htm
[128] http://codes.lp.findlaw.com/histatutes/1/12/194/194-3.
[129] http://health.hawaii.gov/cwb/files/2013/04/Clean_Water_Branch_HAR_11-54_20141115.pdf

E. ALASKA

I. SUMMARY OF ALASKA MARINE INVASIVE SPECIES AUTHORITIES

- The **Department of Fish and Game** (ADF&G) is the lead agency for managing invasive species, excluding noxious weeds, invasive plants and pests managed by the Department of Natural Resources, and the discharge of ballast water managed by the Department of Environmental Conservation. ADF&G is responsible for the protection, management conservation, and restoration of the fish and game resources of Alaska (AS 16.05.010).
- The **Board of Game** has authorities to adopt regulations to allocate resources, establish wildlife conservation areas, hunting seasons, bag limits, harvest means and methods, and establish disposal or propagation programs (AS 16.05.255).
- The **Board of Fisheries** has authorities to consider and adopt regulations to allocate resources between user groups; establish fish reserves and conservation areas, fishing seasons, quotas, and bag limits size restrictions, means and methods, habitat protection, stock enhancement; and to develop commercial, subsistence, sport and personal use fisheries, prohibit and regulate the live capture, possession, transport, or release of native or exotic fish or their eggs (AS 16.05.251).
- The **Department of Environmental Conservation** has the authority to regulate ballast water in Alaska through AS 46.03.750. Pollution standards are described in AS 46.03.070; these standards have numerous references to water qualities and properties associated with preventing harm to public health and terrestrial and aquatic life. Authority for ballast water treatment permitting comes from AS 46.03.100 (waste disposal permit) and AS 46.03.750 (ballast water discharge).

DEC also regulates commercial passenger vessels (cruise ships) through AS 46.03.463.

II. ALASKA LAWS AND REGULATIONS

- Alaska provides a "Clean List" for possession and import exceptions. Without a permit, no person may possess, import, release, export, or assist in importing, releasing, or exporting live game. Species are removed from the Clean List if evidence exists that the species is capable of surviving in the wild in Alaska; causing genetic alternation of an indigenous species; causing significant reduction in the population of an indigenous species; transmitting a disease to an indigenous species; or otherwise presents a threat to the health or population of a species indigenous to Alaska.
- Unless permitted by AS 16.05-AS 16.40 or by regulation adopted under AS 16.05 – AS 16.40, a person may not take, possess, transport, sell, offer to sell, purchase, or offer to purchase fish, game, or marine aquatic plants, or any part of fish, game, or aquatic plants, or a nest or egg of fish or game.
- AS 16.20 gives the Department of Fish and Game the authority to manage refuges, sanctuaries, and critical habitat areas.
- AS 16.40.100 gives the Department of Fish and Game authority over hatcheries and aquaculture operations.
- AAC 37.100 gives the Department of Fish and Game authority to issue permits to processors, buyers, and harvesters of aquatic plants, or people intending to collect and supply wild stock to aquatic farms.

- AAC 92.029 gives the Department of Fish and Game authority to issue permits for possessing live game, and prohibits anyone from possessing, important, releasing, exporting live game, or assisting in these activities, unless the person possesses a permit. Authorities within this section allow the Department to remove species from the permit list if they could cause harm to species indigenous to Alaska.
- 5 AAC 01.010 prohibits the use of nonindigenous fish as bait when engaging in a subsistence finfish fishery.
- 5 AAC 41.005 requires people to possess a permit to transport, possess, export from the state, or release into waters of the state any live fish section AAC 41.070 prohibits anyone from importing live fish into the state for purposes of stocking or rearing in waters of the state (except as provided in sections b-d). (3) Prohibits possession, ownership, breeding, importation, transporting, distribution, release, purchase, or sale of species listed in 50 C.F.R 16.13 injurious species.

VII. GAPS AND CHALLENGES

The following are challenges associated with marine invasive species management and regulations:

Ballast water:

- Discharge standards adopted at international (IMO) and U.S Federal (USCG/EPA) not as protective as determined necessary by some states.
- Ballast water treatment system Type Approval testing (USCG, IMO) does not address the rigid discharge standards of California.
- Limitations exist in the ability of scientific methods/technologies to detect organisms for select discharge standards.
- There is a paucity of compliance assessment protocols for ballast water treatment systems.
- The geographic scope of the West Coast and the international, interjurisdictional entities involved in marine AIS issues requires ongoing coordination via the Pacific Ballast Workgroup and other forums.
- There are too many exemptions to existing ballast water laws.
- Few laws regulate vessel biofouling.

Biofouling:

- Lack of established biofouling management criteria for commercial vessels in all jurisdictions
- In-water cleaning regulations are not consistent across jurisdictions.
- Fishing and recreational vessels engaged in coastwide voyages pose a significant threat for NIS transfer.

Invasive species control:

- Tradeoffs exist in balancing the negative environmental impacts of chemical treatment with positive protection of native habitats and listed species.
- Permitting for rapid response, eradication and control, particularly in the presence of threatened and endangered salmonid populations, is complex and time intensive.
- Long-term sustainable funding for EDRR on the West Coast is inadequate.
- There exists limited detection and treatment technologies, and coordination among detection efforts.

Coordination:

- Coordinating diverse state and provincial activities, agencies and programs, and ensuring communication and high-level priority setting to optimize limited management resources, is difficult.
- Management of marine invasive species is fragmented and overlapping.
- Prioritizing marine invasives for monitoring and prevention efforts is difficult.
- Lack of awareness of, and enforcement of, existing laws among industry, stakeholders and the public.
- Limited public awareness of threats posed by AIS, and costs of managing AIS (particularly marine AIS).
- Lack of aquatic invasive species focus and capacity in some states and provinces.

Aquarium trade:

- Ornamental fish and aquaria regulations need to provide guidelines for prevention and disposal.

VIII. RECOMMENDATIONS

Coordination:

a. Enhance collaboration with Mexico and Canada to prevent West Coast invasions.
b. Collaborate among states and provinces to identify companies (online and mail order) that sell prohibited or restricted species.
c. Improve coordination and collaboration with the federal government to enhance inspections of Internet sales and purchases, border crossings, and imported goods.
d. Create a strategy and decision-making tool at the regional level to address marine AIS.

Research:

a. Identify and fund emerging detection and treatment technologies.
b. Support development of field-ready ballast water treatment compliance verification tools.

Implementation:

a. Establish sustainable, long-term funding for prevention, control, monitoring and management of marine invasives.

Authority:

a. Address deficiencies and inconsistencies in state and provincial legislation associated with marine AIS.
b. Ensure disposal methods of bait and other material at marinas do not contribute to the spread of marine invasives.
c. Expand existing ballast water regulations in states and provinces to include vessel biofouling. Make biofouling maintenance/management practices by vessel operators mandatory.
d. Amend Canada's Fish Health Protection Regulations (within the Fisheries Act) to require that all non-indigenous fish, and not just salmonids, imported to Canada or transferred between provinces be accompanied by an import license.
e. Consistently impose penalties for illegal introductions of invasive species.
f. Consistently impose penalties for failure to comply with AIS prevention and management laws and regulations.
g. Establish and enforce adequate penalties for non-compliant ballast water and biofouling management practices.
h. Require development and implementation of mandatory biofouling management plans for commercial vessels.
i. Work to identify and clarify laws on vessel in-water cleaning.

Control:

a. Establish and share coast-wide protocols to minimize the spread of marine AIS.
b. Ensure restoration practitioners have a set of best management practices to prevent the spread of marine AIS during coastal restoration activities.
c. Encourage better management of vessels undergoing extended duration in ports.
d. Encourage better management of niche areas on ships
e. Carry out seamless integrated management to ensure ecological integrity and achieve strong, long-term protection from marine invasive species.
f. Expedite permitting for rapid response, eradication and control.

Prevention:

Risk Assessment Development

a. Using the latest science and research and focusing on vectors for introduction, identify the highest risk invasive species as well as the most ecologically sensitive areas for marine introductions along the West Coast.

Early Detection

a. Develop a West Coast-wide early detection and monitoring program and network for marine invasives.
b. Implement consistent practices coast-wide for identifying high-risk vessels for marine invasive species, and then for addressing the risk (e.g., quarantine, require out-of-water-cleaning, fines, mandatory removal from port).
c. Develop an inventory of the presence and distribution of native and nonindigenous marine species on the West Coast.

Outreach

b. Develop, adopt, and implement outreach strategies to specific industries to reduce risk of spread. Ensure education is mandatory for vector industries.
c. Ensure policy makers understand the environmental and economic risks associated with marine invasive species.
d. Formalize integration of AIS education into the public education system.
e. Conduct an economic assessment of the cost of marine invasive species to the West Coast.
f. Translate regulatory language into user-friendly publications for industry.
g. Incentivize hull cleaning and dry docking to reduce biofouling.