

# **NATIONAL STRATEGY FOR BALLAST WATER MANAGEMENT: THE BAHAMAS**

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# 1

## Executive Summary

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The National Strategy for Ballast Water Management for The Bahamas provides a plan for addressing the transfer of marine invasive alien species through the ballast water of ships. As an archipelagic nation heavily reliant on the importation of goods and with an economy dependent on marine and coastal resources, managing marine invasive species is of particular importance for The Bahamas. As one of the top flag states on a global scale, the country's actions on ballast water management also have far reaching implications in protecting marine and coastal environments across the world. This strategy identifies a framework and actions that can be taken by The Bahamas to implement the principles of the International Convention for the Control and Management of Ships' Ballast Water and Sediments, developed by the International Maritime Organization (IMO) in 2004.

The strategy identifies the Ministry of Transportation and Aviation as the lead agency responsible for coordinating the activities of the Port Department, Bahamas Maritime Authority, Department of Marine Resources, Bahamas Science Environment and Technology Commission, Grand Bahama Port Authority, College of The Bahamas and environmental non-governmental organizations. These agencies should work together to meet flag and port state responsibilities that include establishing ballast water management procedures for ships registered in The Bahamas, facilitating scientific and technical research to monitor the effects of ballast water management in the waters of The Bahamas, monitoring the compliance of ships berthed in the country, enforcing any penalties for non-compliance and communicating ballast water policies to the shipping industry and IMO.

Costs of implementing the strategy are estimated at BSD1,731,000 for initial implementation within a time frame of two to five years and an annual ongoing cost after implementation of BSD111,000. Reconvening the National Task Force for Ballast Water Management is recommended in order to ensure a holistic implementation of the strategy and facilitate coordination between the different responsible agencies.

## 2 Glossary

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Ballast Water<sup>1</sup>: “water with its suspended matter taken on board a ship to control trim, list, draught, stability or stresses of the ship”

Ballast Water Management<sup>1</sup>: “mechanical, physical, chemical and biological processes, either singularly or in combination, to remove, render harmless, or avoid the uptake or discharge of Harmful Aquatic Organisms and Pathogens within Ballast Water and Sediments”

BEST Commission: Bahamas Environment, Science and Technology Commission

BNT: Bahamas National Trust

BREEF: Bahamas Reef Environment Educational Foundation

BSD: Bahamian Dollar

BW: Ballast Water

BWM: Ballast Water Management

BWM Convention: International Convention for the Control and Management of Ships’ Ballast Water and Sediments

COB: College of the Bahamas

EEZ: Exclusive Economic Zone

IAS: Invasive Alien Species

IMO: International Maritime Organization

GEF: Global Environment Fund

NISS: National Invasive Species Strategy

NGO: non-governmental agency

RAC/REMPEITC-Caribe: Regional Marine Pollution Emergency, Information and Training Center Wider Caribbean

TNC: The Nature Conservancy

UNCED: United Nations Conference on Environment and Development

UNDP: United Nations Development Programme

UNEP: United Nations Environment Programme

WCR: Wider Caribbean Region

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<sup>1</sup> IMO, 2004.

# 3

## Introduction

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Shipping is the backbone of international trade, moving over 90% of goods around the world<sup>2</sup>. While conventional trading ships rely on ballast tanks for safety and fuel efficiency, ballast water within these tanks acts as a conduit for the transfer of invasive alien species (IAS)<sup>3</sup>. IAS are a growing threat in a number of sectors, causing losses in biodiversity, changes in ecosystems, and impacts to economic enterprises such as agriculture, fisheries and international trade<sup>4</sup>. Worldwide, millions of dollars are spent annually to control IAS and to repair the damage they cause<sup>5</sup>.

The International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) was introduced in 2004 by the International Maritime Organization (IMO). This BWM Convention aims to reduce the negative environmental, economic and health impacts that IAS transferred through shipping has on a global scale<sup>6</sup>.

### 3.1 BACKGROUND TO THE ISSUE OF INVASIVE ALIEN SPECIES

IAS occur globally, are represented in every taxonomic group and can have negative economic, environmental and health impacts<sup>7</sup>. In 2010, IAS were recognized as the second largest threat to biodiversity globally. The most harmful of these invaders displace native species, change community structure and alter fundamental ecological processes. Once IAS become established, it can be nearly impossible to eliminate them<sup>8</sup>.

The connection between shipping and the transfer of IAS has been well documented. Marine IAS have been reported in over 80% of the world's marine ecoregions and international shipping has been identified as the most significant introduction method for these species<sup>9</sup>. Approximately 10 billion tonnes of ballast water are transported around the world each year via trading ships and it is estimated that approximately 7,000 marine and coastal species travel daily

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<sup>2</sup> IMO, 2008.

<sup>3</sup> Barry et al., 2008.

<sup>4</sup> Smithsonian Environmental Research Center, Ballast Water, Accessed June 23, 2015

<sup>5</sup> WWF, 2009.

<sup>6</sup> IMO, 2004.

<sup>7</sup> Global Invasive Species Database (GISD). 2015.

<sup>8</sup> Thresher and Kuris, 2004.

<sup>9</sup> Molnar et al., 2008.

across the world in ballast water tanks<sup>10</sup>. International shipping has led to the increase in transfer of marine IAS around the world and is a significant issue that the BWM Convention aims to address.

### **3.1.1 International and regional IAS**

The reliance on international shipping for the transfer of goods has resulted in species from all parts of the world being introduced to new habitats, enhancing the possibility of invasion in ecosystems. IAS are a global threat, whose impacts cost an estimated \$1.4 trillion annually<sup>11</sup>. In the United States alone, invasive species are estimated to cost more than US\$120 billion in damages annually<sup>12</sup>.

In the Caribbean region along with areas along the Atlantic coast of the USA, the green mussel, *perna viridis*, has had significant detrimental impacts<sup>13</sup>. This marine IAS is native to the Asia-Pacific region and has spread via ship ballast water and hull fouling. Due to the spawning nature and fast growth of the mussel, the lack of local predators in the Caribbean and Atlantic seas, and the high tolerance of the species to different environmental conditions, the green mussel is expected to expand in the Atlantic and Caribbean until it reaches its thermal limits.

The mussel can have detrimental economic, ecological and human health impacts<sup>14</sup>. This marine IAS rapidly forms dense colonies and can cause blockages of intake pipes of industrial plants which increases corrosion and reduces efficiency. Mussel colonies also pose a problem for vessels through fouling and damaging internal pipes, causing increases to maintenance costs and decreased fuel efficiency. Fouling on mariculture equipment has led to a reduction in the amount of crab and clam commercial harvests. Although the mussel is consumed in the Asia-Pacific region, in the Atlantic region the mussels have been found to have high levels of accumulated toxins and heavy metals. This makes them unfit for consumption and the mussels have been linked to human shellfish poisoning in the Atlantic and Caribbean region.

### **3.1.2 National IAS**

Island states like The Bahamas are generally considered highly susceptible to IAS due to their particularly vulnerable native biodiversity and predominantly import driven economies. Currently, the most significant marine IAS in The Bahamas is the lionfish. Lionfish are the first non-

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<sup>10</sup> WWF, 2009.

<sup>11</sup> Molnar et al., 2008.

<sup>12</sup> Pimentel et al., 2005.

<sup>13</sup> GISD, 2015.

<sup>14</sup> GISD, 2015.

native marine fish to become established along the Atlantic coast of the U.S.A. and the Caribbean<sup>15</sup>. They were first reported in The Bahamas in 2004 and have been observed throughout the Little Bahama Bank<sup>16</sup>. These invaders are of particular concern in The Bahamas because they act as top predators, occur in high densities, forage more successfully than natives fish species, lack significant predators in the adult phase and reduce reef fish recruitment.

Lionfish have had significant impacts on local ecology and have had detrimental implications for the fishing and tourism industries. The fish prey on over 70 different species including commercially important species like snapper and Nassau Grouper<sup>17</sup>. Lionfish also affect native fish by reducing their available food supply while also preying on small and juvenile fish, shrimps and crabs. Lionfish have been found to displace lobster from artificial habitats and lobster fishermen have already found lionfish in their bycatch and are reporting a decreased number of lobsters in their catch<sup>18</sup>. This lobster displacement can have major socio-economic implications for The Bahamas, as lobster fishery is the largest fishery in the country. Lionfish also prey on cleaner fish that are essential to reef health, an essential component of tourism.

### **3.2 BACKGROUND TO THE ISSUE OF BALLAST WATER MANAGEMENT**

Ballast water management (BWM) is the “mechanical, physical, chemical, and biological processes either singularly or in combination, to remove, render harmless, or avoid the uptake or discharge of harmful aquatic organisms and pathogens within ballast water and sediments”<sup>19</sup>.

#### **3.2.1 International and regional BWM**

The international community has recognized the importance of BWM through their development of and signature to the BWM Convention. The BWM Convention defines treatment standards for ballast water discharges, provides guidance for ballast water treatment systems and identifies procedures to ensure that ballast water is safely discharged with minimal environmental and economic impacts<sup>20</sup>. The BWM Convention will enter into force 12 months after ratification by at least 30 states representing 35% of the world merchant shipping tonnage. As of August 2016, 51

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<sup>15</sup> Hamner et al., 2007.

<sup>16</sup> Morris and Atkins, 2009.

<sup>17</sup> Bahamas National Trust, 2010.

<sup>18</sup> Henderson and Coté, 2011.

<sup>19</sup> IMO, 2004.

<sup>20</sup> IMO, 2004.

states have ratified the BWM Convention, representing 34.87% of world merchant shipping tonnage<sup>21</sup>.

Within the Caribbean and North American region, Saint Kitts and Nevis, Saint Lucia, and Trinidad and Tobago have ratified the BWM Convention. While the USA has not ratified, the country has developed their own BWM programme that has been in effect since 1998<sup>22</sup>.

Within the Caribbean, the GloBallast Project, a joint program between the Global Environment Facility (GEF), the United Nations Development Programme (UNDP) and IMO, has made significant progress in BWM for the region. The GloBallast Project, initiated in 2008, aims to reduce the transfer of harmful aquatic organisms and pathogens in ships' ballast water, through assisting countries to implement the IMO ballast water guidelines and prepare for the entry into force of the BWM Convention. The project has five lead partner countries including The Bahamas along with Jamaica, Panama, Trinidad & Tobago and Venezuela along with several partnering countries from the Wider Caribbean Region (WCR). Under the project, a *Regional Strategic Action Plan to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens in Ships' Ballast Water and Sediments Wider Caribbean Region* has been developed<sup>23</sup>.

### **3.2.2 National BWM**

While there is currently no BWM taking place in The Bahamas, the country has made some progress in developing a strategy to address ballast water. The Bahamas is a lead partnering country in the GloBallast Project. As a partner country, The Bahamas took part in introductory training in BWM (2008), a workshop to facilitate implementation of the BWM Convention (2008), regional training on legal implementation of BWM Convention (2009) and Capacitating the Training institute GloBallast activity to empower national institutes with the GloBallast Compliance Monitoring and Enforcement (CME) training package (2016).

### **3.3 INTERNATIONAL, REGIONAL AND NATIONAL OBLIGATIONS**

The Bahamas has a number of international, regional and national obligations related to ocean governance, marine resource management and environmental protection that are relevant to BWM.

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<sup>21</sup> IMO, 2016.

<sup>22</sup> NOAA, 2015.

<sup>23</sup> RAC-REMPEITC, GloBallast, IMO, 2012.

### 3.3.1 Regional Agreements or Treaties

The table below summarizes The Bahamas' major regional agreements and programmes concerning ocean governance and marine resource management.

**TABLE 1: MAJOR MARINE RELATED REGIONAL AGREEMENTS**

<b>Agreement/Programme</b>	<b>Purpose</b>
Caribbean Sea Commission	Established in 2008 by the Association of Caribbean States. Promotes and oversees sustainable use of the Caribbean Sea.
Caribbean Regional Fisheries Mechanism	Inaugurated in 2003. Inter-governmental organization aimed at sustainable use of region's fisheries and aquatic resources.
Regional Water Management and Action Plan (SAP) for the Wider Caribbean Region (WCR)	Provides a regional framework for the reduction of HAOP transfer according to the BWM Convention through enhancing regional cooperation and capacity in BWM matters.
Caribbean Memorandum of Understanding for Port State Control	A regional ship inspection program whereby foreign vessels entering a sovereign state's waters are boarded and inspected to ensure compliance with various major international maritime conventions.

### 3.3.2 Conventions

The table below summarizes the major international conventions concerning the protection of the marine environment that The Bahamas has ratified.

**TABLE 2: MAJOR MARINE RELATED INTERNATIONAL CONVENTIONS**

<b>Convention</b>	<b>Purpose</b>
International Convention for the Prevention of Pollution from Ships, London, 1973 [MARPOL]. Annexes I, II, III, V, VI	Main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes.
Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, London, 1978	Modifies various provisions of MARPOL and postpones entry into force of Annex II of the MARPOL Convention
United Nations Convention of the Law of the Sea, Montego Bay, 1982 [UNCLOS]	States shall take all measures necessary to prevent, reduce and control pollution of the marine environment resulting from the use of technologies under their jurisdiction.
Convention on Biological Diversity, Rio de Janeiro, 1992	States have a responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or area beyond the limits of national jurisdiction.

Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Montreal, 2000	States shall ensure an adequate level of protection in the field of the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements.
Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)	Ensure that international trade in wild animal specimens does not threaten the survival of the animals. Aims to reduce the endangered status of species.
Convention on Wetlands of International Importance especially as Waterfowl Habitats [RAMSAR]	States commit to the conservation and sustainable use of wetlands through local and national actions and international cooperation
Convention on Transboundary Movement of Hazardous Waste and their Disposal [Basel Convention], Basel, 1989	States shall take action to protect human health and the environment from detrimental effects of hazardous wastes.
Protocol on Pollution from Land-Based Sources and Activities	Parties should mitigate land based sources, in particular domestic waste and agricultural non-point sources, from polluting marine areas.
Stockholm Convention on Persistent Organic Pollutants, Stockholm, 2001	Aimed at eliminating or restricting the production and use of persistent organic pollutants.
International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS)	Aimed at preventing the introduction of toxic chemicals in the aquatic system, and ultimately the human food chain.
Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries and subsequent Technical Guidelines	Sets out principles and international standards of behavior for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources, with due respect for the ecosystem and biodiversity.

The table below summarizes national acts and regulations related to marine issues.

**TABLE 3: THE BAHAMAS' MARINE RELATED ACTS AND REGULATIONS**

<b>Act/Regulation</b>	<b>Purpose</b>
Bahamas Maritime Authority Act	An Act to provide for the establishment of a body corporate to be known as The Bahamas Maritime Authority, and for the functions relating to that Authority and to make provision in respect of matters connected therewith or ancillary thereto.
Bahamas Merchant Shipping Act	An Act to make provision for the registration of ships; for the control, regulation and orderly development of merchant shipping; to make provision for the proper qualification of persons employed in the sea service; to regulate the terms and conditions of service of persons so employed; and for matters

	connected with and incidental to the foregoing.
Bahamas Merchant Shipping (Oil Pollution) Act	An Act to make provision concerning oil pollution of navigable waters by ships; to provide for the civil liability for oil pollution by merchant ships; to give effect to certain International Conventions relating to pollution of the sea; and for matters connected with and incidental to the foregoing
Merchant Shipping (Entry in Dangerous Spaces) Regulations	A regulation to enforce that except when necessary for entry thereto, the master of a ship shall ensure that all entrances to unattended dangerous spaces on the ship are either kept closed or otherwise secured against entry.
Merchant Shipping (Hatches and Lifting Plant) Regulations	A regulation to ensure that any hatch covering or lifting plant used on a ship is of sound construction and material, of adequate strength for the purpose for which it is used, free from patent defect and properly maintained.

### **3.4 RELEVANCE OF BALLAST WATER AS A VECTOR OF IAS TO THE COUNTRY**

The marine and coastal environments of The Bahamas are of critical importance to several key industries. The country is heavily reliant on the tourism industry, which accounts for approximately 60% of GDP and 50% of the nation’s workforce<sup>24</sup>. Most tourism activities and attractions are coastally based and rely on coastal and marine resources such as beaches and coral reefs. Fisheries is also a significant industry, accounting for thousands of livelihoods<sup>25</sup> and over BS\$96 million of exports annually<sup>26</sup>. Coastal aquaculture and harvesting of marine resources are in initial stages of development and have the potential to become lucrative industries for the nation<sup>27,28</sup>. All of these industries have the potential to be negatively impacted by the introduction of marine IAS introduced through ballast water.

#### **3.4.1 History of shipping industry, economic impact**

The Bahamas has a long history in the shipping industry beginning with Nassau becoming one of the busiest ports in the region during the American Civil War in the 1860s<sup>29</sup>. The deepening of the Nassau Harbour in the 1920s contributed to the growth of the industry as deep-draft vessels were able to access the port. Beginning in the 1950s, the development of Freeport in Grand Bahama as a major shipping hub increased the significance of shipping for the nation. The passing

<sup>24</sup> Bahamas Department of Statistics, 2015.

<sup>25</sup> Bahamas Department of Statistics, 2012.

<sup>26</sup> Ministry of Agriculture and Marine Resources, 2013.

<sup>27</sup> FAO, Accessed June 23, 2015.

<sup>28</sup> Meyer, 2014.

<sup>29</sup> Crayton, 1986.

of the Merchant Shipping Act of 1976 allowed for ships to be registered in The Bahamas and resulted in the emergence of the country as a major flag state on a global scale<sup>30</sup>.

As a small island state, The Bahamas is heavily reliant on the importation of goods via international shipping. Given the limited scope of manufacturing and agricultural industries, the country imports approximately 90% of material resources via sea, including food, medical supplies, and fuel needed to provide electricity<sup>31</sup>. This heavy reliance on imported goods makes shipping a vital component of human security for the nation.

Shipping has become a vital component of the Bahamian economy with the industry considered to be the third-most important sector of the economy. The Bahamas operates one of the largest shipping registries in the world with more than 1,000 registered vessels with a gross tonnage of approximately 58 million from 60 countries<sup>32</sup>. This registry generates an annual revenue of approximately US\$14 million of which US\$4 million adds to the Government of The Bahamas consolidated fund<sup>33</sup>.

Given that the majority of goods are imported into the country, there are many businesses that service the shipping industry. The provision of container handling, stevedoring, customs brokerage and local delivery as well as port and ship repair facilities are all services provided that contribute to the economy. In total, the shipping and maritime industry is estimated to contribute 20% to the Bahamian economy<sup>34</sup>.

### **3.4.2 Environmental effects**

The Bahamas is an archipelagic nation, consisting of an area of approximately 300,000 square kilometers of which 95% is marine<sup>35</sup>. Only 5% of Bahamian territory is comprised of land in the form of some 700 islands and over 2,500 cays. The Bahamas contains the largest tropical shallow water area in the Western Atlantic and is home to a variety of marine and coastal ecosystems that would be affected by the introduction of any IAS<sup>36</sup>. Critical marine and coastal ecosystems including mangroves and wetlands, seagrass, coral reefs and sandy beaches provide

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<sup>30</sup> Bahamas Maritime Authority, 2014.

<sup>31</sup> Nassau Container Port, 2014.

<sup>32</sup> Bahamas Maritime Authority, 2014.

<sup>33</sup> Commonwealth Secretariat, 2013.

<sup>34</sup> Commonwealth Secretariat, 2013.

<sup>35</sup> Sealey, 2006.

<sup>36</sup> Anselmetti et al., 2000.

critical ecosystem services<sup>37</sup>. These services include coastal protection from storms, provision of nurseries for fish, habitats for endemic species and havens for migratory species<sup>38</sup>. These coastal and marine ecosystems are also critical for economic activities that are reliant on these natural resources including fisheries, tourism and aquaculture.

The introduction of marine IAS could have significant environmental effects on the marine and coastal environment. Lionfish, a marine IAS that has already infiltrated Bahamian waters, has had impacts on marine biodiversity<sup>39</sup>. Introduction of additional marine IAS has the potential to affect the vast majority of the country's territory.

### **3.4.3 Public health issues**

Ballast water discharge typically contains a variety of biological materials, including micro-organisms like viruses and bacteria. The introduction of biological materials into the waters of The Bahamas may have dire implications for public health. The population of the country consumes a broad variety of fish and shellfish sourced from Bahamian waters<sup>40</sup> that could become contaminated by foreign viruses and bacteria and result in significant health impacts. For example, in 1991, a form of cholera previously reported only in Bangladesh arrived via ballast water in Peru<sup>41,42</sup>. This introduction of cholera resulted in the deaths of more than 10,000 people over the following three years and was the first cholera outbreak in the Western hemisphere in more than 100 years.

## **3.5 SCOPE**

This strategy applies to the marine and coastal environments under the jurisdiction of the Government of the Commonwealth of The Bahamas and seeks to implement the ideals of the BWM Convention. The strategy covers a wide range of governmental stakeholders including the Ministries of (i) Transport and Aviation, (ii) Agriculture, Marine Resources and Local Government and (iii) Environment and Housing. The strategy also involves academia, NGO's and the private sector.

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<sup>37</sup> BNT, 2014.

<sup>38</sup> The Nature Conservancy, 2010.

<sup>39</sup> Henderson and Cotê, 2011.

<sup>40</sup> Ministry of Agriculture and Marine Resources, 2013.

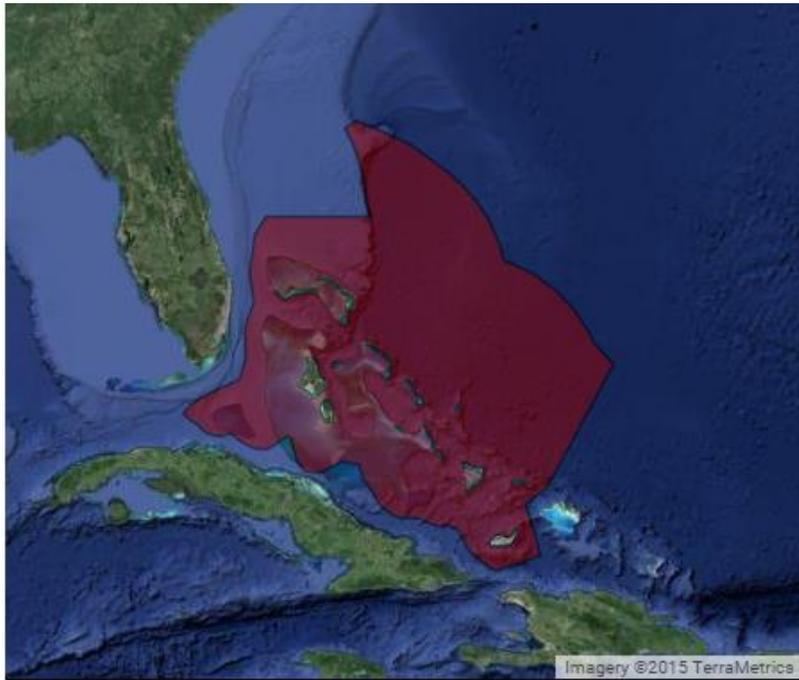
<sup>41</sup> Albert et al., 1993.

<sup>42</sup> Siddique et al., 1992.

### 3.5.1 Geographical scope

This plan covers the territorial waters of The Bahamas, comprised of the exclusive economic zone. The exclusive economic zone of the Bahamas is estimated to be 629,293 square kilometers as shown in Figure 1.

**FIGURE 1: EXCLUSIVE ECONOMIC ZONE OF THE BAHAMAS<sup>43</sup>**



### 3.5.2 Technical scope

The development of a BWM strategy should take a holistic view towards a number of interrelated components. The following components must be taken into consideration with respect to this BWM Strategy:

- Building management capacity;
- Building research capacity;
- Promotion of information sharing;
- Strengthening of legislation;

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<sup>43</sup> Marine Regions, The Bahamas. Accessed June 23, 2015.

- Risk analysis/assessment; and
- Public awareness.

### ***3.5.2.1 Addressing only ballast water as a vector for IAS and not all other problems***

Marine IAS have a number of pathways as shown in Table 4. This BWM strategy focuses on ballast water as a vector for the introduction of IAS.

**TABLE 4: PATHWAYS FOR THE TRANSFER OF MARINE IAS**

<b>Pathway Type</b>	<b>Intentional/Unintentional</b>
Production/propagation in developed ecosystems including live food fish, aquarium and aqua garden trade, aquaculture	Intentional
Production /propagation in natural ecosystems including live bait fish, stocking, aquatic weed control	Intentional
Consumption or processing of fish products	Unintentional
Commercial shipping via ballast water and hull fouling	Unintentional
Recreation/tourism in the form of boating or float planes	Unintentional
Movement of waste	Unintentional

# 4

## Purpose of the strategy

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The National Strategy for Ballast Water Management for The Bahamas is an essential step in addressing the need to manage the transmission of species from different world regions. The IMO has identified ballast water as a major factor in the movement of IAS into marine environments and has called for an international approach to prevent and reduce alteration of these environments via ballast water. As such, IMO Member States are tasked with developing national strategies as part of a coordinated, integrated and international approach in reducing the transmission of species via ballast water. This national strategy identifies coordinated actions that can be taken by stakeholders within The Bahamas to manage ballast water impacts.

### 4.1 WHY THE STRATEGY HAS BEEN WRITTEN

The National Strategy for Ballast Water Management for The Bahamas has been written to identify issues of concern related to ballast water in the country and to identify a strategy to address these issues. The Bahamas is subject to a constant influx of international ships carrying much needed items for the country. However, along with needed goods come potentially detrimental IAS that are introduced to the waters of the nation. Due to the potential of these species to affect biodiversity, health and the economy of the nation, there is a pressing need for an approach to determine the impacts of these species and to devise a strategy for reducing any detrimental effects.

### 4.2 GUIDING PRINCIPLES

The United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil in 1992 contains a number of guiding principles that guide the development of the BWM strategy:

1. In section 17.30 from the report of the UNCED<sup>44</sup>: “States, acting individually, bilaterally, regionally or multilaterally and within the framework of IMO and other relevant international organizations, whether subregional, regional or global, as appropriate, should assess the need for additional measures to address degradation of the marine environment:

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<sup>44</sup> UN, 1992.

(a) From shipping by: (vi) Considering the adoption of appropriate rules on ballast water discharge to prevent the spread of non-indigenous organisms"

2. From Annex I, a number of guiding principles are applicable to ballast water management<sup>45</sup>:
  - a. Principle 2: "States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction."
  - b. Principle 7: "States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command."
  - c. Principle 10: "Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided."
  - d. Principle 11: "States shall enact effective environmental legislation. Environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply. Standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries."

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<sup>45</sup> UN, 1992.

- e. Principle 13: “States shall develop national law regarding liability and compensation for the victims of pollution and other environmental damage. States shall also cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.”
- f. Principle 14: “States should effectively cooperate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health.”
- g. Principle 15: “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”
- h. Principle 16: “National authorities should endeavor to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.”

# 5

## Objectives

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The objective of this BWM strategy is to identify a framework and actions that can be taken within The Bahamas as part of an international approach to addressing negative impacts of ballast water. The strategy aims to abate any detrimental impacts of IAS transmitted via ballast water. The particular objectives of the strategy are to:

- a. Identify existing knowledge and knowledge gaps on the impact of marine IAS in The Bahamas;
- b. Identify measures that need to be taken to fill knowledge gaps including research and monitoring activities;
- c. Develop a BWM framework for The Bahamas;
- d. Identify stakeholders and avenues for their involvement in BWM; and
- e. Identify areas where capacity needs to be built to effectively manage ballast water.

### 5.1 WHAT THE STRATEGY IS SEEKING TO ACHIEVE

The strategy seeks to achieve an integrated and coordinated framework for BWM in The Bahamas that incorporates the involvement and actions of governmental agencies, non-governmental organizations and private institutions. The strategy aims to identify the issues of concern associated with ballast water for The Bahamas and to provide a methodology of addressing these issues.

### 5.2 WHAT IS THE DESIRED OUTCOME?

The desired outcome is a feasible framework that can be incorporated and utilized by stakeholders in The Bahamas to minimize any detrimental effects of ballast water for the nation while maintaining a thriving shipping industry. The strategy will provide a pathway for the implementation of an effective BWM programme for The Bahamas.

### **5.2.1 Institutional targets**

- Identification and coordination of stakeholders in an effective BWM strategy;
- Increased capacity for stakeholders to fulfill their obligations of the BWM strategy;
- Implementation and enforcement of legislation specifically targeting ballast water and addressing the BWM Convention.

### **5.2.2 Environmental targets**

- Identification and continuous monitoring of marine IAS and their impacts in The Bahamas;
- Mitigation of negative impacts of marine IAS in The Bahamas;
- Prevention and reduction of marine IAS introduced via ballast water.

### **5.2.3 Social or economic targets**

- Implementation of BWM strategy without unduly affecting the shipping, fishing, tourism and other industries dependent on marine resources of The Bahamas;
- Increase public awareness of marine IAS;
- Identification of impacts of marine IAS related to social and economic issues such as public health or fisheries.

# 6

## Invasive Alien Species

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### 6.1 RESULTS OF STUDY ON THE MAGNITUDE OF BALLAST WATER AS AN IAS VECTOR

No study focused on the magnitude of ballast water as an IAS vector has been completed in The Bahamas. Given the importance of marine and coastal environments to the country and the high volume of international ships that frequent Bahamian waters, such a study should be conducted.

#### 6.1.1 Integration of ballast water management into broader IAS management and coastal management process

The Bahamas currently has no final policy or legislation that takes an integrated approach to IAS and coastal zone management. However, there are separate policies that address IAS and coastal zone management individually.

A National Invasive Species Strategy (NISS) was developed in 2003 to address invasive species and methods of increasing public awareness and involvement<sup>46</sup>. The strategy recommends (i) the development of a database on invasive species, (ii) training of customs, agricultural, fisheries and enforcement officers in identification, safe handling, holding, transfer and disposal of invasive species, (iii) establishment of monitoring systems in public areas, national parks, protected areas, freshwater sources and field stations, (iv) enforcement of legislation related to management and control of alien species, and (v) eradication and control of identified priority species. However, this strategy was not implemented due to a number of factors including inadequate legislation, lack of a formalized institutional framework, limited inter-agency coordination and limited human, financial and institutional capacity<sup>47</sup>. In 2013, a revised NISS was developed<sup>48</sup>. This revised NISS aimed to facilitate implementation of the strategy through identifying interventions to be made in a number of areas. While the NISS does recognize the introduction of IAS through ballast water, there are no specific measures to address BWM. Therefore, a specific BWM strategy is needed as the introduction of marine IAS through shipping is of particular concern for The Bahamas.

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<sup>46</sup> BEST Commission, 2003.

<sup>47</sup> Moultrie, 2013.

<sup>48</sup> Moultrie, 2013.

Implementation of this revised NISS has not occurred to date. If action utilizing the revised NISS does take place, the BWM strategy should be incorporated.

Currently coastal zone management takes place through a number of governmental ministries and departments with overlapping responsibilities. However, there have been recent strides in the development of an integrated coastal zone management (ICZM) policy for The Bahamas. A draft framework to guide the development of a national ICZM policy is currently in the process of being completed through the BEST Commission. If an ICZM policy is developed and implemented, the BWM strategy should be incorporated.

## **6.2 INTERNATIONAL OBLIGATIONS**

While The Bahamas has not yet ratified the BWM Convention that is focused specifically on the transport of marine IAS through ballast water, other conventions that The Bahamas is party to are related to IAS. These conventions and their objectives were provided in greater detail in Section 3.3.2 of this document and included the Convention on Biological Diversity and the United Nations Convention of the Law of the Sea.

## **6.3 RESPONSIBLE ENTITIES/DEPARTMENTS**

There is no formal agency that has responsibility for IAS in The Bahamas as the NISS has not been developed into a policy and implemented. The Bahamas Environment, Science and Technology (BEST) Commission, part of the Ministry of Environment and Housing, functions as the focal point for IAS in general in The Bahamas. The 2013 NISS recommended the establishment of a national coordinating body to facilitate involvement of a number of governmental agencies and NGO's. This national coordinating body was to be a quasi-government agency led by the Department of Agriculture. However, there has been no development of such an agency to date.

### **6.3.1 New legislation and the requirements to implement**

The NISS forms the basis for the development of legislation and policy related to IAS. However, there are not currently any acts or regulations that address IAS.

## **6.4 EVALUATION AND MONITORING OF PORTS**

As there are no existing IAS legislation or policies, there are no formal responsibilities for the evaluation and monitoring of ports for marine IAS.

# 7

## Ballast Water Management

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The National Strategy for Ballast Water Management for The Bahamas is guided by BWM Convention that aims to stop the spread of detrimental marine organisms across regions.

From Article 4 of the BWM Convention:

- Each Party shall, with due regard to its particular conditions and capabilities, develop national policies, strategies of programmes for Ballast Water Management in its ports and waters under its jurisdiction that accord with, and promote the attainment of the objectives of this Convention.”

The obligations of port and flag states in the BWM Convention consist of monitoring, enforcement and incursion management in the event that an invasion of IAS takes place. The obligations of industry in the BWM Convention consist of installation of ballast water management systems, training and record keeping.

The responsibilities of The Bahamas as flag state for ballast water management include the following:

- Establishing procedures for BWM Certificates for ships registered in The Bahamas:
  - i. Developing certification requirements;
  - ii. Communication of requirements to ships registered in The Bahamas;
  - iii. Surveying ships for compliance and issuing BWM Certificates;
  - iv. Maintaining records of issued BWM Certificates.
- Approving ships BWM Plans

The responsibilities of The Bahamas as a port state for ballast water management include the following:

- Facilitating scientific and technical research to monitor the effects of BWM:
  - i. Observing, measuring, sampling, evaluating and analyzing the effectiveness and any detrimental impacts of BWM.

- Compliance monitoring and enforcement:
  - i. Inspection of ships berthing in The Bahamas to determine BWM compliance.
- Provision of a sediment reception facility for any dry docks that service international vessels:
  - i. This is only applicable to Grand Bahama Port as it is the only port in the nation that offers dry docking and ship repair for international vessels.
- Communication to industry of ballast water policies that are to be followed within The Bahamas:
  - i. Providing ships with the location and terms of use of areas designated for ballast water exchange, warnings about ballast uptake in the event of emergency and the availability, and location and capacities of reception facilities;
  - ii. Notifying ships where ballast water should not be up taken due to negative environmental conditions.
- Communication of ballast water policies to IMO and other member states of the IMO.

## **7.1 RESPONSIBLE AGENCY OR DEPARTMENT**

A number of agencies have duties that are associated with BWM and should be included the comprehensive BWM strategy for The Bahamas. These agencies that have responsibilities related to BWM are as follows:

1. Ministry of Transportation and Aviation

Within the Ministry of Transportation and Aviation, The Port Department is mandated with enforcing strict safety measures, providing services and port facilities to international trading vessels and regulating environmental issues within the Port.<sup>49</sup> Additionally, the Port Department is responsible for carrying out the inspection of foreign flagged vessels calling in The Bahamas and liaising with the Bahamas Maritime Agency.

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<sup>49</sup> The Port Department, accessed 5 May, 2014 <http://www.bahamas.gov.bs/port>

Also within the Ministry of Transportation and Aviation, The Bahamas Maritime Authority registers vessels, enforces ship safety requirements and monitors standards<sup>50</sup>. In addition, the BMA also liaises with the IMO, the European Commission, the US Coast Guard and other international bodies. The BMA requires ships seeking registration in The Bahamas to meet the highest international standards.

## 2. Ministry of Agriculture, Marine and Local Government

Within the Ministry of Agriculture, Marine and Local Government the Department of Marine Resources is tasked with the administration, management and development of fisheries in The Bahamas<sup>51</sup>. Areas of responsibility of the Department of Marine Resources related to BWM include data collection, addressing science and conservation issues and public education and training.

## 3. Ministry of Environment and Housing

Within the Ministry of Environment and Housing, the BEST Commission<sup>52</sup> is mandated with serving as The Bahamas' national focal point and official point of contact for all international organizations on matters relating to the environment, science and technology. Areas of responsibility of BEST Commission related to BWM include protection, conservation and management of the environment and relations with national and international organizations on matters relating to the environment<sup>53</sup>.

## 4. Grand Bahama Port Authority

The Grand Bahama Port Authority is responsible for the development, administration and management, and provision of services within the Port Area of Grand Bahama<sup>54</sup>. This includes regulatory responsibility for environmental compliance.

## 5. NGOs and Academic Institutions

There are a number of NGO's and academic institutions that may wish to play a role in the BWM strategy for the nation. Environmental NGO's, including the Bahamas National Trust (BNT), Bahamas Reef Environment Educational Foundation (BREEF) and The Nature Conservancy (TNC),

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<sup>50</sup> The Bahamas Maritime Authority. Accessed 2 May 2014 <http://www.bahamasmaritime.com/>

<sup>51</sup> Department of Marine Resources. Accessed 2 May 2014 <http://www.bahamas.gov.bs/marineresources>

<sup>52</sup> Bahamas Environment, Science and Technology Commission. Accessed 2 May 2014. [www.best.bs](http://www.best.bs)

<sup>53</sup> Ministry of Environment and Housing. Accessed 2 May 2014. <http://www.bahamas.gov.bs>

<sup>54</sup> Grand Bahama Port Authority. Accessed 2 May 2014. <http://gbpa.com>

along with academic institutions, including the College of The Bahamas (COB), may wish to be involved in scientific and technical research and public education and outreach.

### 7.1.1 Division of labour

**TABLE 5: DIVISION OF LABOR FOR BWM STRATEGY**

<b>Stakeholder</b>	<b>Responsibility</b>
Ministry of Transportation and Aviation	Focal point for BWM Strategy <ul style="list-style-type: none"> <li>Facilitating implementation of flag and port state responsibilities;</li> <li>Communication of BW policies to IMO and other member states of the IMO.</li> </ul>
Port Department	Port State Responsibilities: <ul style="list-style-type: none"> <li>Inspection of ships berthing in The Bahamas to determine BWM compliance;</li> <li>Providing ships with the location and terms of use of areas designated for BW exchange, warnings about BW uptake in the event of emergency and the availability, location and capacities of reception facilities;</li> <li>Notifying ships where BW should not be up taken due to negative environmental conditions;</li> <li>Developing port specific BWM plans.</li> </ul>
Bahamas Maritime Authority	Flag State Responsibilities: <ul style="list-style-type: none"> <li>Developing certification requirements;</li> <li>Communication of requirements to ships registered in The Bahamas;</li> <li>Surveying ships for compliance and issuing BWM Certificates;</li> <li>Maintaining records of issued BWM certificates;</li> <li>Approving ships BWM plans.</li> </ul>
Department of Marine Resources	Port State Responsibilities: <ul style="list-style-type: none"> <li>Aiding in the facilitation of scientific and technical research to monitor the effects of BWM;</li> <li>Public education.</li> </ul>
Ministry of Environment and Housing (BEST Commission)	Port State Responsibilities: <ul style="list-style-type: none"> <li>Aiding in the facilitation of scientific and technical research to monitor the effects of BWM.</li> </ul>
Grand Bahama Port Authority	Port State Responsibilities: <ul style="list-style-type: none"> <li>Providing a sediment reception facility for BW.</li> </ul>
NGO's and Academic Institutions (e.g. BNT, BREEF, TNC, COB)	Port State Responsibilities: <ul style="list-style-type: none"> <li>Aiding in the facilitation of scientific and technical research to monitor the effects of BWM;</li> <li>Public education.</li> </ul>

### 7.1.2 New legislation and the requirements to implement

The pollution of Bahamian water from foreign ships is included in some Bahamian legislation listed below. However, the specific issue of ballast water is not included in any existing legislation and there is no specific procedure for addressing ballast water pollution.

1. Archipelagic Waters and Maritime Jurisdiction Act, 1993<sup>55</sup>
  - a. Chapter 282 Section 5.2: “The passage of a foreign ship shall be deemed to be prejudicial to the peace, good order or security of The Bahamas if, the ship while in the archipelagic waters or territorial sea of The Bahamas, engages in any of the following activities: (f) any act of pollution calculated or likely to cause damage or harm to The Bahamas, its resources or its marine environment.”
  - b. Chapter 282 Section 6 : “Where a foreign ship engages in any of the activities specified in subsections (2) and (3) of section 5 or prescribed under paragraph (i) of section 5(2), as the case may be, or where a law enforcement officer suspects on reasonable grounds that a foreign ship is engaged in any such activity, such law enforcement officer may in the course of his duty — (a) stop, board and search the ship for the purpose of carrying out enquiries and investigations; (b) without warrant or other process seize and detain the ship and bring it into a port of The Bahamas; (c) without warrant or other process arrest the captain and any person on board the ship whom he reasonably suspects to be participating in the activity of the ship which is deemed to be prejudicial to the peace, good order or security of The Bahamas.”
2. Merchant Shipping (Oil Pollution) Act, 1989<sup>56</sup>
  - a. An Act to make provision concerning oil pollution of navigable waters by ships; to provide for the civil liability for oil pollution by merchant ships; to give effect to certain International Conventions relating to pollution of the sea; and for matters connected with and incidental to the foregoing.

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<sup>55</sup> Archipelagic Waters and Maritime Jurisdiction.  
[http://laws.bahamas.gov.bs/cms/images/LEGISLATION/PRINCIPAL/1993/1993-0037/ArchipelagicWatersandMaritimeJurisdictionAct\\_1.pdf](http://laws.bahamas.gov.bs/cms/images/LEGISLATION/PRINCIPAL/1993/1993-0037/ArchipelagicWatersandMaritimeJurisdictionAct_1.pdf)

<sup>56</sup> Merchant Shipping (Oil Pollution) Act  
[http://laws.bahamas.gov.bs/cms/images/LEGISLATION/PRINCIPAL/1976/1976-0017/MerchantShippingOilPollutionAct\\_1.pdf](http://laws.bahamas.gov.bs/cms/images/LEGISLATION/PRINCIPAL/1976/1976-0017/MerchantShippingOilPollutionAct_1.pdf)

Due to the lack of existing legislation specifically focused on BWM, there are a number of different strategies that could be chosen to address ballast water pollution. For Strategies 1-3, legislation should be flexible enough to allow for the incorporation of the existing BWM Convention and any future convention dealing with hull and equipment fouling<sup>57</sup>.

**Strategy 1:** Draft amendments to existing Acts

The Archipelagic Waters and Maritime Jurisdiction Act and the Merchant Shipping (Oil Pollution) Act address marine pollution issues. However, these Acts are inadequate in regards to addressing the specific issue of ballast water pollution. Thus, the Acts would need to be amended to include all issues related to BWM including requirements for international ships berthing in The Bahamas, requirements for port facilities and penalties for failure to adhere to requirements.

**Strategy 2:** Draft new regulations to govern ballast water pollution

A Ballast Water Management Act would need to be drafted to include all issues specifically related to ballast water. The development of this Act would not require amendments to be made to existing Acts. This Act would be focused solely on ballast water pollution similar to the Merchant Shipping (Oil Pollution) Act that specifically addresses oil pollution and not on other forms of pollution from ships.

**Strategy 3:** Draft new comprehensive marine environmental protection regulations

A comprehensive marine environmental protection regulation would address ballast water pollution as part of a larger framework of marine environmental protection. This legislation should consider all threats to marine biodiversity including ballast water. This strategy would require significant inter-agency cooperation in order to ensure the protection of biodiversity from a number of threats, including ballast water and oil pollution.

**Strategy 4:** Take administrative action without legislation

Without legislation, The Bahamas can implement some aspects of BWM including the voluntary submission of ballast water reports and samples from ships. Ships can be encouraged on a voluntary basis to develop and implement BWM plans. This administrative action without legislation is recommended by the IMO for countries that are new to addressing ballast water or for

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<sup>57</sup> McConnell, 2002.

countries that have not already developed administrative or infrastructural capacity to fully respond to alien species in ballast water<sup>58</sup>.

## **7.2 Ballast Water Management Plan**

All ships in international traffic must develop a ship-specific Ballast Water and Sediments Management Plan (BWM Plan). Guideline G4 of the BWM Convention provides detailed recommendations for the development of the plan by each ship. The BWM Plan includes the maintenance of a BW Record Book, an international BWM Certificate and training of ship crew on duties required to implement the BWM Plan. Each ship must have a designated officer on board that is responsible for ensuring that the BWM Plan is adhered to properly.

### **7.2.1 BWM Certificate**

The Flag State issues the BWM Certificate to ships, to which the Convention applies, that comply with BW standards. Section E of the BWM Convention provides the details of requirements for the initial, annual, intermediate and renewal surveys and certification requirements. The BWM Certificate shall be issued to ships registered in The Bahamas by the Bahamas Maritime Authority.

### **7.2.2 BWM Plan**

The IMO has developed a number of technical guidelines to aid in supporting the BWM Convention. Guideline G4<sup>59</sup> provides a standard format for the development of ship-specific BWM Plans. The plan provides details for operational, recording and training procedures necessary to meet the required ballast water performance standards. Detailed requirements for ships ballast water performance standards are in regulation B-3 of the BWM Convention. MEPC 69-21-Add.1 details the timelines for ships to adhere to performance standards and is dependent upon the date of entry into force of the BWM Convention<sup>60</sup>.

### **7.2.3 BWM Record Book**

The BWM Record Book details when ballast water is taken on board, when ballast water is circulated or treated and when ballast water is discharged into the sea. The record book also details when ballast water is emitted into a reception facility and whether there were any accidental discharges of ballast water. Further details of the BWM Record Book are found in

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<sup>58</sup> McConnell, 2002.

<sup>59</sup> Tamelander et al., 2010.

<sup>60</sup> MEPC, 2016.

Regulation B-2 of the BWM Convention. A sample format for the BWM Record Book is provided in Annex 2 of this document.

#### **7.2.4 Ensuring compliance among ships flying the country’s flag**

Article 7 of the BWM Convention states that the flag state for ships is responsible for survey and certification of ballast water management plans. The Bahamas Maritime Authority is tasked with registering ships and should be the agency responsible for ensuring that ships develop and maintain the required BWM plans. Upon renewal of registration, the BWM plans should be inspected and certified. It is recommended that the Bahamas Maritime Authority make use of the standard International Ballast Water Management Certificate. Ships are to be surveyed a number of times according to Regulation E-1 of the BWM convention. This includes initial, intermediate, annual and any other additional surveys. A standard procedure for conducting surveys of BW management of ships needs to be developed.

#### **7.2.5 Inspection of Ships**

Under Article 9 of the BWM Convention, ships may be inspected to determine that the ship has a valid BWM Certificate and that the BWM record book is up to date. Inspection of ships shall be conducted by port officials of the Port Department of The Bahamas. If any concerns are found, then a detailed inspection may take place and ballast water from the ship may be sampled. There are two categories of sampling detailed in the BWM Convention: sampling for compliance with the D-1 standard and sampling for compliance with the D-2 standard. Neither category of sampling should cause undue delays to the vessel.

The table below lists options available to port authorities in verifying ship ballast water management compliance.

**TABLE 6: METHODS OF VERIFYING BWM COMPLIANCE<sup>61</sup>**

<b>Method</b>	<b>Description</b>	<b>Responsibility of Port Department</b>	<b>Effectiveness in Reducing IAS</b>
Reporting	Reporting by ship personnel that BWTS has been installed, maintained and operated properly and that BW standards	Review report from ship	Low; difficult to verify if report is accurate

<sup>61</sup> GEF-UNDP-IMO GloBallast Partnerships Programme and IUCN, 2010

	have been met		
Inspections	Random or targeted onboard inspections of BWTS	Inspect the BWTS equipment onboard the vessel	Low; difficult to verify that BWTS is operating effectively
Monitoring (Indirect Measurement)	Use data from sensors of BWTS to determine organisms in BW	Review data to ensure that vessel meets discharge standards	High; sensors provide data about actual content in BW
Sampling (Direct Measurement)	Direct sampling and analysis of BW	Conduct sampling and analyze either at Port or at a laboratory facility	Low if intensity and extent of sampling is limited. High if intensity and extent of sampling is extensive <sup>62</sup> .

### 7.2.6 Enforcement and Penalties

Enforcement of the BWM Convention shall be conducted by the Port Department and by the Bahamas Maritime Authority in the event that the ship is registered in The Bahamas. If a ship is not registered in The Bahamas but is berthing in a port of The Bahamas is found to be non-compliant with the BWM Convention, the Port Department may warn, detain or exclude the ship. According to Article 10 of the BWM Convention: “If a ship is detected to have violated this Convention, the Party whose flag the ship is entitled to fly, and/or the Party in whose port or offshore terminal the ship is operating, may...take steps to warn, detain, or exclude the ship. The Party in whose port or offshore terminal the ship is operating, however, may grant such a ship permission to leave the port or offshore terminal for the purpose of discharging Ballast Water or proceeding to the nearest appropriate repair yard or reception facility available, provided doing so does not present a threat of harm to the environment, human health, property or resources.”

Penalties shall be determined based on the severity of the offense. Article 8 of the BWM Convention states that “the sanctions provided for by the laws of a Party pursuant to this Article shall be adequate in severity to discourage further violations”.

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<sup>62</sup> GEF-UNDP-IMO GloBallast Partnerships Programme and IUCN, 2010.

# 8

## Implementation Plan

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Implementation of the National Strategy for Ballast Water Management for The Bahamas requires institutional arrangements, information gathering, legislation and communication.

### 8.1 INSTITUTIONAL ARRANGEMENTS

The National Strategy for BWM requires the participation and coordination of a number of governmental agencies and private organizations. Open communication and sharing of information will need to be facilitated by the lead agency to ensure that the strategy is implemented with the involvement of all responsible agencies. The strategy requires action from the nation as both a port state and as a flag state and these actions must be coordinated. This section details the coordination that needs to take place in order to ensure successful implementation of ballast water management.

#### 8.1.1 Regional or National responsibilities

At a regional scale, The Bahamas can promote the development of a regional approach to BWM by continued participation in the development and implementation of the *Regional Ballast Water Management Strategy and Action Plan for the Wider Caribbean Region*. This will allow for identification of best practices, partnerships with other nations and fulfill regional agreements related to marine conservation.

At the national scale, coordination between the Ministry of Transportation and Aviation, Port Department, Bahamas Maritime Authority, Department of Marine Resources, BEST Commission and any interested NGO's and academic institutions must take place. While each of these stakeholders has a different responsibility with respect to the BWM strategy, collaboration is necessary to ensure a unified approach to implementation.

#### 8.1.2 Lead Agency

The Ministry of Transportation and Aviation is the lead agency responsible for the implementation of the BWM strategy. The Ministry should facilitate coordination of the agencies and implementation of the strategy through the National Task Force for BWM.

### **8.1.3 Task Force**

A National Task Force for BWM was established in The Bahamas in 2012 and consisted of representatives from:

- Department of Marine Resources;
- BEST Commission;
- Grand Bahama Port Authority;
- Office of Attorney General;
- College of The Bahamas; and
- Port Department.

The National Task Force has not been active since 2013 and should be reactivated. The Task Force should also be expanded to include representatives from the Bahamas Maritime Authority and from any interested NGO's. The Task Force is comprised of members from the agencies that are responsible for implementing the national BWM strategy. The task force should ensure that the responsibilities of each agency are being met and that coordination between agencies takes place. The Task Force will also be responsible for an annual review of the BWM Strategy for The Bahamas.

### **8.1.4 Cross-sectoral collaboration**

The National Task Force and the Lead Agency should consider linkages to non-maritime sectors such as the Ministry of Health to determine whether the strategy can benefit from the inclusion of additional sectors.

## **8.2 INFORMATION GATHERING**

Essential to the successful implementation of BWM is information about the extent of marine IAS in Bahamian waters. This information needs to be initially gathered, updated periodically and shared with all relevant stakeholders.

### **8.2.1 Risk Assessment, Survey and Monitoring of IAS**

Port biological baseline surveys need to be conducted to determine the concentration of marine IAS currently in The Bahamas and to identify vulnerable ports. These surveys will provide a

baseline that will be used to measure the impacts of BWM on reducing IAS. The baseline surveys should be followed with periodic biological surveys of the ports. These periodic surveys will monitor concentrations of IAS, allow for assessment of the efficacy of BWM and identify any necessary changes. Department of Marine Resources, BEST Commission, NGOs and COB may be best positioned to facilitate port biological surveys.

Information from the baseline and periodic surveys should be incorporated into a national information database. This national information database should also include all data on ship ballast water collected during inspections and through voluntary submission by ships. Any accidental or emergency discharges of ballast water in Bahamian waters should also be recorded. This database will allow for the monitoring of marine IAS through space and time. The national information database can be developed through inter-agency cooperation and include Ministry of Transportation and Aviation, Ministry of Environment and Housing, College of The Bahamas, and NGO's.

### **8.2.2 Research and Development of Ballast Water Management Schemes**

The national information database will allow the impact of changes to BWM to be monitored. By continuously monitoring the level of marine IAS, any necessary changes to BWM can be determined. Continuous research is necessary to refine a suitable ballast water strategy for The Bahamas.

### **8.2.3 Monitoring of National Strategy implementation**

As the Lead Agency, the Ministry of Transportation and Aviation will be responsible for monitoring the implementation and enforcement of the national strategy. The National Task Force should also be involved in monitoring and evaluation of the strategy. A monitoring and evaluation plan should be developed to ensure that agencies are completing their responsibilities and that the BWM strategy is implemented holistically.

### **8.2.4 Evaluation & Review of Strategy**

The National Task Force will review the national strategy on a yearly basis. An independent review will take place every five years. These reviews will evaluate the periodic surveys of ports and enforcement of the strategy to determine whether any changes need to be made to the strategy.

## **8.3 LEGISLATION AND REGULATION**

Legislation and regulation are imperative to the successful implementation of the BWM Strategy. This section details actions that need to be taken in regards to policy development, compliance and enforcement of the BWM Strategy and coordination and cooperation with regional and international partners.

### **8.3.1 Policy**

Dependent on the strategy chosen from Section 7.1.2 of this report, legislation for the implementation of the BWM Convention needs to be drafted and finalized, taking into consideration both international and regional obligations. While legislation is being drafted and finalized, voluntary compliance of ships can be enacted.

### **8.3.2 Compliance and Enforcement**

The Port Department and the Bahamas Maritime Authority are responsible for enforcing BWM for ships berthing at Bahamian ports and for ships registered to the Bahamian flag. Training of workers that will be tasked with BWM enforcement is required.

### **8.3.3 Cross Jurisdictional Coordination**

Pursuant to the *Regional Ballast Water Management Strategy and Action Plan for the Wider Caribbean Region*, coordination of cross-jurisdictional agreements may need to be identified and implemented. This can be facilitated by the continued participation of The Bahamas in this regional plan.

### **8.3.4 Fostering international links and cooperation**

Continued participation with IMO, GloBallast and other international organizations is necessary to access best practices and keep current with developments in BWM. These best practices can be incorporated into the BWM Strategy for The Bahamas during annual reviews conducted by the Task Force.

## **8.4 COMMUNICATION, AWARENESS RAISING AND TRAINING**

### **8.4.1 National Governmental Agencies**

To communicate the need for BWM and to identify potential partnerships, presentations about marine IAS should be made to the different governmental Ministries. While the Ministry of

Environment and Housing, Ministry of Transportation and Aviation and Ministry of Agriculture, Marine and Local Government are the primary Ministries involved in the strategy, other Ministries such as Ministry of Health or Ministry of Works and Urban Development may wish to participate in a more limited capacity.

#### 8.4.2 Industry

Within the industry, presentations and training on marine IAS should be conducted to increase awareness. Bahamas Maritime Authority is responsible for communicating BWM requirements to ships registered under the Bahamian flag. The Port Department is responsible for communicating BWM policies to ships berthing in The Bahamas. Those engaged in fisheries in particular need to be educated as they can play a major role in the identification of IAS.

#### 8.4.3 Public

Informing the public about marine IAS is essential in reducing impacts and gaining support for BWM. Local NGO's have already begun some public education about marine IAS through making information about the lionfish available<sup>63</sup>. Partnerships can be made with environmental NGOs and academic institutions such as COB, to aid in sensitizing the public to the impacts of marine IAS.

### 8.5 IMPLEMENTATION TIMELINE

The table below details steps to be taken to implement the strategy, responsible agencies and a tentative timeline. The sequencing and tentative timeline of implementation steps is likely to be revised as progress on the strategy commences.

**TABLE 7: IMPLEMENTATION TIMELINE**

<b>Activity</b>	<b>Responsible Agencies</b>	<b>Tentative Timeline</b>
Reconvenement of National Task Force	Ministry of Transportation & Aviation	Oct 2016
Endorsement of National BWM Strategy	National Task Force	Dec 2016
Communication to governmental ministries and public about marine IAS and BWM	Ministry of Transportation & Aviation; National Task Force, Department of Marine Resources, NGO's, COB	Jan-Aug 2017
Training of port and flag state	Ministry of Transportation &	Jan-Aug 2017

<sup>63</sup> The Nature Conservancy, 2016.

officers	Aviation	
Development of port specific BWM plans including standard inspection and reporting procedures	Port Department	Aug 2017-March 2018
Development of certification requirements	Bahamas Maritime Authority	Aug 2017-March 2018
Port biological baseline surveys	Ministry of Transportation & Aviation, Port Department, Department of Marine Resources, BEST Commission, NGO's, COB	Aug 2017-March 2018
Development of national information database	Ministry of Transportation & Aviation, Port Department, Department of Marine Resources, BEST Commission, NGO's, COB	Aug 2017-March 2018
Determination of BW exchange areas within Bahamian waters	Ministry of Transportation & Aviation	Aug 2017-Dec 2017
Review and update of National BWM Strategy	National Task Force	December 2018
Development and enactment of national BWM legislation and policy	Ministry of Transportation & Aviation, National Task Force, Attorney General's Office	Jan 2017-March 2018
Provision of a sediment reception facility for BW	Grand Bahama Port Authority	April 2018
Communication of BWM requirements to ships registered under the Bahamian flag	Bahamas Maritime Authority	April 2018
Communication of BWM policies to ships berthing in The Bahamas	Port Department	April 2018
Communication of BW policies to IMO and other member states of the IMO	Ministry of Transportation & Aviation	April 2018
Full implementation of BWM for The Bahamas: begin enforcement and compliance actions	All agencies	May 2018

# 9

## Funding

The Economic Assessment for Ballast Water Management in The Bahamas developed a summary of costs associated with implementing a holistic BWM strategy<sup>64</sup>. A summary of the costs is found in Table 7.

**TABLE 8: COSTS ASSOCIATED WITH BWM STRATEGY**

Category	Activity	One-Time Cost	On-Going Annual Cost
<b>Preparatory Costs</b>	Introductory Training Workshops (4)	\$20,000	
	Stakeholder Meetings (4)	\$20,000	
	National Meetings		\$1,000
	Regional Meetings		\$20,000
	Legislative and Policy Reform	\$5,000	
	Legislative review and implementation	In Kind	
	Port biological baseline surveys	\$1,500,000	
	Risk assessments	\$44,000	
<b>Flag State Compliance Costs</b>	Development of compliance measures	\$5,000	
	Training of inspectors	\$40,000	
<b>Port State Compliance Costs</b>	Training for inspections	25,000	
	Training for sampling	\$52,000	
	Designation of BW exchange areas	\$5,000	
<b>Other Costs</b>	Port biological monitoring		90,000
	Port BWM plans	\$15,000	
<b>Total</b>		<b>\$1,731,000</b>	<b>\$111,000</b>

### 9.1 IMPLEMENTATION FUNDING (INITIAL 2 – 5 YEARS)

From the Economic Assessment for Ballast Water Management in The Bahamas report, implementation funding for the initial phase of strategy implementation is estimated at BSD 1,731,000. This is broken down into:

#### 9.1.1 Staffing

As the duties of BWM can be incorporated into the existing responsibilities of Ministries and Departments, there are no specific costs estimated for staffing. Depending on input from the relevant Ministries and Departments, there may be the need to hire additional staff if current staff is unable to take on BWM tasks.

<sup>64</sup> Thomas, 2016a.

### **9.1.2 Gathering information, inspections, studies**

Funding for the development of legislation and policy reform is estimated at BSD5,000. There is potential for an in kind contribution from the Attorney General's office for legislative review and implementation. Given the high number of ports within the archipelago, port biological baseline surveys are estimated at BSD1.5M. Risk assessments of ports is estimated at BSD44,000. The development of compliance measures is estimated at BSD5,000. A study to determine safe BW exchange areas is also estimated at BSD5,000. The development of port specific BWM plans is estimated at BSD15,000.

### **9.1.3 Supporting costs (communication, training, monitoring and evaluating)**

Funding for training staff on ship inspections and BW sampling is estimated at BSD77,000 to fulfil port state obligations. To fulfil flag state obligations, training inspectors to ensure BWM compliance and the issuance of BWM certificates is estimated at BSD40,000. Stakeholder meetings focused on communicating the BWM strategy are estimated at BSD20,000. Introductory training workshops focused on educating relevant Ministries and Departments about their roles in BWM are estimated at BSD20,000.

## **9.2 ONGOING FUNDING**

From the Economic Assessment for Ballast Water Management in The Bahamas report, ongoing funding for BWM is estimated at BSD111,000 per year. This is broken down into:

### **9.2.1 Staffing**

As BWM can be integrated into the existing duties of staff, there is no specific budget for staffing needed to implement the BWM strategy on an ongoing basis. Depending on input from the relevant Ministries and Departments, there may be the need to hire additional staff if current staff is unable to take on BWM tasks.

### **9.2.2 Gathering information, inspections, studies (5 years and beyond)**

Port biological monitoring is estimated at BSD90,000 per year.

### **9.2.3 Supporting costs (communication, training, monitoring and evaluating)**

Attending national and regional meetings to stay abreast of BWM developments is estimated at BSD21,000 per year.

# 10

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# Annex 1: Summary of National Ballast Water Status Assessment findings

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The National Ballast Water Status Assessment for The Bahamas aimed to provide an overview of the Bahamian shipping industry and the associated economic sectors that may be affected by marine IAS<sup>65</sup>. The report provided a summary of key issues that supported the need for an effective ballast water strategy to be implemented in The Bahamas.

Key findings from the report include:

- Shipping is a significant industry for the Bahamian economy and plays a vital role in providing goods that the Bahamian population is reliant upon. Shipping is also a key factor in human security of the nation.
- The Bahamas has one of the world's largest fleets as a flag state with over 1, 600 registered vessels.
- The Bahamas is well connected via shipping to the rest of the world and has the highest liner ship connectivity in the Caribbean region.
- Inter-island shipping is an important service that connects islands within the nation to each other. Inter-island shipping also means that IAS found in one port can easily be transported to other ports.
- The marine and coastal environment of The Bahamas is essential to the fishing, coastal tourism, aquaculture and marine resources industries.
- Marine IAS in the form of lionfish are already found in the waters of The Bahamas and have impacted the fisheries industry.
- The Bahamas will have responsibilities as both a flag and a port state under the BWM Convention.
- There are a number of stakeholders that will be affected by a BWM strategy including the Bahamas Maritime Authority, Ministry of Environment and Housing, Bahamas Port Authority, College of the Bahamas, environmental NGO's and ship owners.

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<sup>65</sup> Thomas, 2016b.

# Annex 2

## Ballast Water Record Book

INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS' BALLAST WATER AND SEDIMENTS

Period From: ..... To: .....

Name of Ship .....

IMO number .....

Gross tonnage .....

Flag .....

Total Ballast Water capacity (in cubic metres) .....

The ship is provided with a Ballast Water Management plan

Diagram of ship indicating ballast tanks:

Entries into the BW Record Book are to be made whenever BW is taken on board, circulated, treated or released. Below are sample formats for recording BW activity

Taken on Board

Date	Time	Location (port or lat/long)	Volume (m <sup>3</sup> )	Signature of Officer in Charge

Circulated or Treated

Date	Time	Volume circulated or treated (m <sup>3</sup> )	Conducted in accordance with BWM Plan	Signature of Officer in Charge

Discharged into the sea

Date	Time	Location (port or lat/long)	Volume (m <sup>3</sup> )	BWM plan implemented prior to discharge	Signature of officer in charge

Discharge to a reception facility

Date/Time/Location of Uptake	Date/Time/Location of Uptake	Port or Facility	Volume (m <sup>3</sup> )	BWM plan implemented prior to discharge	Signature of officer in charge

Accidental or exceptional uptake or discharge

Date	Time	Port or location	Volume (m <sup>3</sup> )	Circumstances and general remarks	BWM plan implemented prior to discharge	Signature of officer in charge