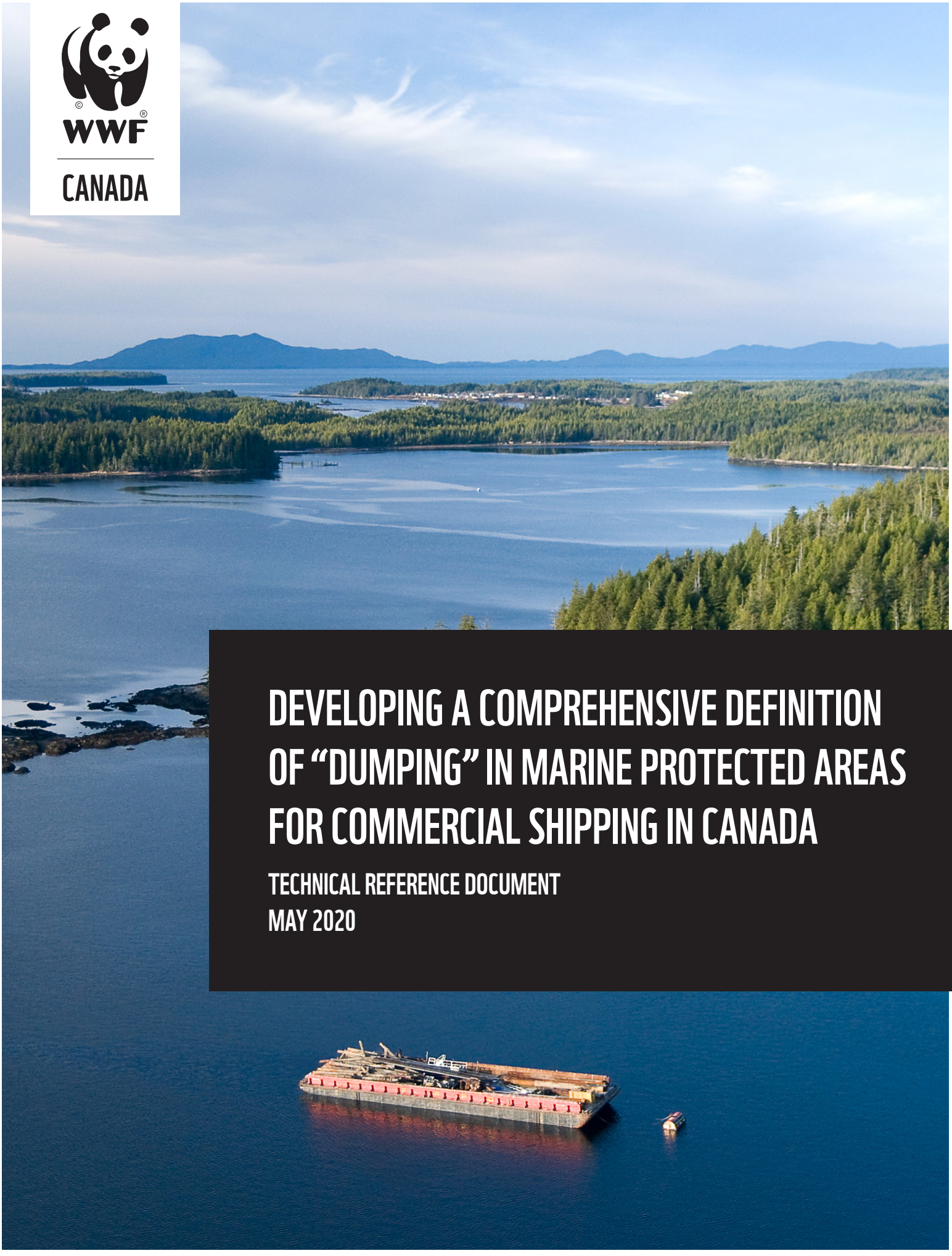

WWF CANADA

DEVELOPING A COMPREHENSIVE DEFINITION OF "DUMPING" IN MARINE PROTECTED AREAS FOR COMMERCIAL SHIPPING IN CANADA

TECHNICAL REFERENCE DOCUMENT

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BACKGROUND

In April 2019, the Government of Canada announced new standards for marine protected areas prohibiting dumping, oil and gas exploration, mining and bottom trawling.

This was a result of public consultations carried out by an independent National Advisory Panel of experts to gather perspectives and offer recommendations to the Minister of Fisheries, Oceans and the Canadian Coast Guard.

These new standards apply to all federal marine protected areas, including National Marine Conservation Areas, National Wildlife Areas, Migratory Bird Sanctuaries, and Marine Protected Areas designated under the *Oceans Act* (1996).

Within the context of commercial shipping, "dumping" lacks a comprehensive definition and therefore may be subject to interpretation in Canada's waterways. The adoption of new standards offers a unique opportunity to develop a clear definition that will prohibit the release of all harmful substances from shipping in marine protected areas. This will help to achieve Canada's long-term conservation goals of healthy and resilient ecosystems.

Current status

In Canada, there are international laws (Box 1) and national laws (Box 2) governing commercial shipping related to "dumping". Under these laws, different terminologies and definitions are used, including "dumping", "disposal", "discharge" and "deposit". These definitions do not explicitly include sewage, effluent, grey water, garbage, scrubber liquid effluent or dredged material because they are considered part of a vessel's normal operations. These excluded substances can be detrimental to the marine environment and coastal communities.

BOX 1 INTERNATIONAL LEGISLATION

The *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972* (London Protocol) defines the term "dumping" as:

a. any deliberate disposal into the sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea;
b. any deliberate disposal into the sea of vessels, aircraft, platforms or other man-made structures at sea;
c. any storage of wastes or other matter in the seabed and the subsoil thereof from vessels, aircraft, platforms or other man-made structures at sea; and
d. any abandonment or toppling at site of platforms or other man-made structures at sea, for the sole purpose of deliberate disposal.[2]

Canada is a contracting Party to the London Protocol and meets these international obligations through the *Canadian Environmental Protection Act* (1999) (see Box 2).

The *International Convention for the Prevention of Pollution from Ships* (MARPOL) was adopted in 1973 to prevent pollution of the marine environment from routine and accidental operations of ships. Annex I regulates the release of oil pollution from operational measures and accidental discharges. Annex IV regulates sewage discharge, including discharge limits for untreated sewage. Annex V regulates garbage disposal, including a ban on the disposal of all plastics into the sea.[3]

Canada is a signatory country to MARPOL and has ratified Annexes I, II *(Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk*) and III (*Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form*).[4] Provisions of these international obligations are incorporated under various sections of the *Canada Shipping Act* (see Box 2).

BOX 2 CANADIAN LEGISLATION

The *Canadian Environmental Protection Act* does not explicitly mention "dumping". Instead, it defines the term "disposal" as:

a. the disposal of a substance at sea from a ship, an aircraft, a platform or another structure;
b. the disposal of dredged material into the sea from any source not mentioned in paragraph (a);
c. the storage on the seabed, in the subsoil of the seabed or on the ice in any area of the sea of a substance that comes from a ship, an aircraft, a platform or another structure;
d. the deposit of a substance on the ice in an area of the sea;
e. the disposal at sea of a ship or aircraft;
f. the disposal or abandonment at sea of a platform or another structure; and
g. any other act or omission that constitutes a disposal under regulations made under paragraph 135(3)(c).[5]

The *Canada Shipping Act*, 2001 refers to "dumping" under the term "discharge" defined as: a discharge of a pollutant from a vessel, or a discharge of oil from an oil handling facility engaged in loading to or unloading from a vessel, that directly or indirectly results in the pollutant entering the water, and includes spilling, leaking, pumping, pouring, emitting, emptying, throwing and dumping.[6] This act includes the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* (2007).

The *Arctic Waters Pollution Prevention Act* (1985) is a 'zero discharge' act that prohibits the deposit of any kind of waste in Arctic waters.[7] Under this act, the *Arctic Shipping Safety and Pollution Prevention Regulations* (2017) govern navigation in coastal waters within Canadian jurisdiction north of 60 degrees latitude. All vessels above 100 tons navigating in Canadian Arctic waters must comply with these regulations.[7]

KEY CONSIDERATIONS

This section identifies six harmful substances that should be included in a comprehensive definition of "dumping" for commercial shipping in marine protected areas. These include sewage, grey water, ballast water, liquid effluents from exhaust gas cleaning systems, solid waste and oil discharges.

SEWAGE

Sewage, also known as blackwater, is the general term for human body waste, and may extend to water from toilets and waste from medical facilities and live animal sites.[8]

Sewage discharge can introduce invasive species and produce fecal-contaminated waters, which pose health risks to humans that eat fish and bivalves from these areas.[9,10] The environmental impacts of sewage discharge can be amplified in areas with low temperature and light conditions. For example, sewage discharge in the Arctic has a slow decomposition rate.[11]

In 2017, a study presented to the International Maritime Organization showed that 97 per cent of sewage treatment plants installed on ships still did not meet all the discharge standards.[14]

In accordance with MARPOL Annex IV (Prevention of Pollution by Sewage from Ships), Canada's *Arctic Shipping Safety and Pollution Prevention Regulations* (2017) state that a vessel carrying more than 15 persons or a gross tonnage of 400 in Canadian Arctic waters may discharge sewage as far as practicable from areas of sea ice concentrations exceeding 1/10.[12] MARPOL Annex IV does not explicitly mention dumping in marine protected areas.

Canada has not formally acceded to MARPOL Annex IV; however, acts in accordance with these international regulations under the *Canada Shipping Act* (2001) in Division 4 of the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* (2007).[13] These regulations ban the discharge of untreated sewage within three nautical miles of land (for ships less than 400 tons) and 12 miles of land (for ships larger than 400 tons) in Canadian waters, with some exceptions. Discharge of treated sewage in Canadian waters is subject to specified limits of fecal coliforms.

GREY WATER

Grey water is generally characterized as untreated wastewater that has not come in contact with toilet waste. It may include discharges from sinks, showers, galleys and laundry. The pollution levels can be comparable to untreated municipal sewage on land and contain a wide variety of pollutants, including nutrients, oil and grease, detergent and soap residue, metals (e.g. copper, lead, mercury), coliform bacteria and pathogens.[15]

Grey water can lead to excessive nutrient offload and algal growth, generating dead zones (hypoxic or low oxygen areas). Oil and grease content from grey water can coat fish gills and prevent breathing. It can also increase particulate matter in the water, which suffocates smaller species like crabs, lobsters and sponges.

Grey water from ships is not regulated internationally. Only some countries have introduced specific restrictions within their national jurisdictions. Under the *Canada Shipping Act* (2001), the *Vessel Pollution and Dangerous Chemicals*

Regulations (2012) set out standards that are additional or complementary to MARPOL. Transport Canada also developed the Pollution Prevention Guidelines for the Operation of Cruise Ships Under Canadian Jurisdiction (2005). In waters south of 60 degrees latitude, a passenger vessel carrying more than 500 passengers must treat any release of grey water within three nautical miles of land. Untreated grey water may be discharged outside three nautical miles.[16]

In Canadian waters north of 60 degrees latitude, grey water is not explicitly defined. This is problematic, as it then follows the general definition of "waste". Under the *Arctic Waters Pollution Prevention Act* (1999), waste is defined as: any water that contains a substance in such a quantity or concentration that, if added to any other water, would alter quality to an extent that is detrimental to man or by an animal, fish or plant that is useful to man. This could result in vessels claiming that cleaning products used onboard are technically not waste, and subequenty release untreated grey water.[17]

BALLAST WATER

Ballast water is the water used in the ballast tank of a ship to adjust weight and maintain stability. The water is drawn in at the ship's place of origin and pumped out at its destination. Ballast water may contain thousands of organisms (e.g. algae, bacteria, larvae) native in one ecosystem and released as alien species in another.

Shipping transports 90 per cent of all goods globally, making ballast water translocations the most prominent marine vector for invasive species.[19]

Ballast water has long been known as a primary vector for invasive species, which have shown extensive detrimental effects on ecosystems.[18] Ballast water and sediment discharge can also have human health impacts due to an increase in parasites and diseases, as well as cultural impacts through the demise of native species used for community subsistence harvesting.[20,21]

Ballast water is regulated under the *International Convention for the Control and Management of Ships Ballast Water and Sediments* (2004), requiring that vessels exchange ballast water at a specific depth and distance from land. It also sets out specific parameters for permitted quantities of organisms and pathogens in discharged ballast water and sediment, which require an on-board ballast water treatment system. In Canada, there are designated areas to exchange ballast water, but no specific mention of marine protected areas.[22]

LIQUID EFFLUENTS FROM EXHAUST GAS CLEANING SYSTEMS

Exhaust gas cleaning systems, also known as scrubbers, are designed to remove sulfur oxides from exhaust gases from fuel burned in marine engines.[23] The process generates scrubber liquid effluent that contains heavy metals and polycyclic aromatic hydrocarbons (PAHs). This effluent can cause mutations and negatively impact marine life. Coastal communities that rely on healthy marine species for food and livelihood can also be impacted.[24]

Due to the acidic character of scrubber liquid effluent, it can result in high turbidity, immediate and localized environmental degradation, and higher temperatures relative to the surrounding water.[25] Seawater, which is naturally alkaline, can dilute and neutralize the pH of scrubber washwater. However, the buffering capacity of seawater may be considerably less in nearshore environments due to freshwater flux from rivers. This effectively increases the volume of seawater needed to neutralize acidic discharge.[26]

Discharging acidic solutions in northern marine environments is particularly problematic, as these environments are already disproportionately affected by ocean acidification. This is due to the heightened capacity of cold water to absorb atmospheric CO_2.[27] Acidic waters also have potential implications for calcifying organisms like shellfish.[28]

Scrubber liquid effluent from ships is not regulated internationally. However, several coastal states and ports around the world have adopted local regulations to restrict or prohibit the discharge of this harmful substance.[29] The International Maritime Organization developed guidelines for

scrubber liquid effluent discharge limits around pH, PAHs, turbidity, nitrates, washwater additives and other substances. These have been adopted in Canadian waters south of 60 degrees latitude, but not for waters north of 60 degrees latitude.[30]

GARBAGE

Garbage, or solid waste, includes food waste, hazardous waste, and domestic and operational waste generated during the regular operations of a ship.

Discharge of solid waste is regulated internationally under MARPOL Annex V, and in Canada under Division 5 of the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* (2007).[31] However, accidental and intentional dumping of garbage and solid wastes still occurs in areas where enforcement of regulations is difficult.[32] For example, while American standards for solid waste disposal from cruise ships are stronger than Canadian standards, illegal dumping of solid waste is still reported in American waters.[33]

Disposal at sea of garbage, including plastic, is banned under MARPOL Annex V. However, recent research shows that immense amounts of plastic waste in the ocean are still originating from ships.[34]

Plastics pose a significant threat to marine life and can remain in the environment for years. Birds feeding on the surface of the sea are vulnerable to ingesting floating plastic that is mistaken for food. Similarly, marine species dwelling below the sea surface may ingest submerged plastic. Plastics affect hundreds of marine species ranging from microscopic plankton to large mammals, and often results in mortality.

OIL DISCHARGES

Oil discharges are mainly associated with bilge water, discharges from routine operations, illegal cleaning of tanks and propeller shaft bearings. Between 1988 to 1997, international operational discharges have been estimated at approximately 200,000 tonnes annually.[35]

The impact of oil discharges depends on the properties of the oil, toxicity, volume and discharge location.[36] Oil discharges can be difficult to clean up and persist in ocean sediment and the marine environment for years. Discharged oily mixtures have the potential to eliminate species vulnerable to changes in the marine environment, and cause behavioural disturbances and malformations in marine animals. Birds are especially impacted when oil reduces the waterproofing and insulating properties of their feathers, leading to death from hypothermia.

MARPOL Annex I covers the prevention of routine and accidental oil pollution from ships. According to these regulations, “any discharge into the sea of oil or oily mixture from ships of 400 gross tonnages and above shall be prohibited” except when “the oil content of the effluent without dilution does not exceed 15 parts per million”. However, this may not be adequate; a discharge as low as 0.1 parts per million of an oily mixture can be harmful in the marine environment.[37]

CONCLUSION

Currently, the only definition of "dumping" used in Canada comes from the London Protocol (1972). Yet, it is not comprehensive in the context of commercial shipping within marine protected areas and excludes key harmful substances.

WWF-Canada supports the Government of Canada's decision to prohibit dumping under the new standards for marine protected areas.

In Canadian legislation, "dumping", "disposal", "discharge", and "deposit" are also used synonymously and/or considered a component of another's definition. Without clarity, prohibiting dumping under the new standards for marine protected areas may become subject to interpretation.

To ensure long-term conservation goals are met for these areas, "dumping" for commercial shipping needs to have a clear and comprehensive definition.

In the context of commercial shipping and marine protected areas, WWF-Canada recommends that a comprehensive definition of "dumping" is developed and incorporated into Canadian law. This definition should include:

- **sewage (treated and untreated),**
- **grey water (treated and untreated),**
- **ballast water exchange,**
- **effluents from exhaust gas cleaning systems (scrubber liquid effluent),**
- **solid waste (including plastics), and**
- **oil discharges.**

A comprehensive definition for commercial shipping will provide clarity on what kind of dumping is prohibited under the new standards for marine protected areas.

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