

# Right whales and vessels in Canadian waters

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Received 5 July 2007; received in revised form 15 August 2007; accepted 15 August 2007

## Abstract

The North Atlantic right whale (*Eubalaena glacialis*) is the most critically endangered large cetacean and is threatened by vessels that travel in their habitats and migration paths. A need to address the endangered population status of the right whale emerges as current management mandates have proven ineffective at preventing vessel-strikes to right whales and current rates of strike-induced mortality can slow or prevent recovery of the species. This paper identifies the need for an internationally acceptable management strategy to minimize vessel-strikes to right whales in Canadian waters.

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**Keywords:** Right whale; Vessel-strike; Marine management

## 1. Introduction

The most endangered large cetacean, the North Atlantic right whale (*Eubalaena glacialis*), is threatened by human activities in coastal waters along the eastern coast of North America. The right whale is slow moving and has a low profile in the water, making it particularly vulnerable to being struck by vessels. Right whale deaths due to ship-strikes are not abating and may be increasing. In this paper, we briefly review the ecology and population status of the North Atlantic right whale and assess the level of Canadian governmental and legislative attention to the documented potential for extirpation and possible extinction of this species. We also address shipping within an institutional and legal context and consider the management opportunities available to governmental and legislative institutions that may mitigate vessel strikes. Such management opportunities demonstrate a capacity within

which the Canadian government can address the divergent interests of shipping and the protection of the right whale.

## 2. Whales in a population and ecological context

### 2.1. General status of right whales

The World Conservation Union (IUCN) Red List of Threatened Species identifies 62 species of cetaceans at various levels of risk of extinction [1]. Factors contributing to the decline of global cetacean populations include shipping, historical and continued overexploitation, fisheries by-catch and habitat destruction [2,3]. Random events such as ship-strikes, if sufficiently frequent, or if populations are sufficiently small, can lead to species extinction if left unabated [4]. Special attention must be paid to the immediate population state and dynamic if extinction or other deleterious effects to a dwindling population are considered either irrational or simply undesirable.

An examination of large whale population trends reveals that right whales (genus *Eubalaena*) are considered to be at the highest risk of extinction of all the large baleen whales [5]. Although receiving partial international protection in 1935 by the League of Nations, the right whale has yet to fully recover from overexploitation [6]. Three distinct species of right whales exist [7,8]: *Eubalaena japonica*

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(North Pacific right whale), *Eubalaena australis* (Southern right whale) and *E. glacialis* (North Atlantic right whale) with different “populations” ranging from a few to several hundred individuals [7,9]. The International Whaling Commission (IWC) estimates nearly 300 *E. glacialis* individuals remain and recognizes that species recovery has been close to non-existent [10]. Kenney et al. [9] consider *E. glacialis* to have recovery potential and suggest that protective measures could be effective. Caswell et al. [11] estimate that the western North Atlantic right whale population has a defined likelihood of extinction within 200 years if mitigation efforts are not adopted now.

With five known critical habitats (Table 1), *E. glacialis* migrates throughout the coastal waters of eastern Canada and the United States [9]. Two known sources of anthropogenic mortality (following the 1949 formal IWC right whale hunting ban) are vessel strikes and fishing gear entanglement [12,13]. Knowlton et al. [14] identified other reasons that may contribute to slow population recovery rates of the North Atlantic right whale, such as habitat loss, habitat degradation, low reproductive rates and inbreeding events. However, these contributing factors are difficult to address and are not easily mitigated in the short-term, while entanglement with fishing gear and ship strikes can be more promptly tackled with some positive effect. Although entanglement with fishing gear contributes to right whale deaths, vessel strikes are considered the most urgent threat to the population [11], though there may be a bias in ship-strike reporting relative to gear entanglements [15].

## 2.2. Numbers tell the story

Vanderlaan and Taggart [18] demonstrate that right whales are generally more likely to collide with a vessel in comparison with other large marine mammals. In fact, a

Table 1  
North Atlantic right whale habitats and roles along the seasonal migratory route along the continental shelf of eastern North America

Area	Role
Scotian Shelf, including Browns and Baccaro Banks, Roseway Basin and areas to the east	Summer–autumn feeding habitats for mature individuals
Lower Bay of Fundy	Summer–autumn feeding and nursery grounds, mainly mother–calf pairs
Great South Channel east of Cape Cod	Spring–early summer feeding and nursery grounds
Cape Cod Bay and Massachusetts Bay	Late winter–early spring feeding and nursery grounds
Coastal Florida and Georgia including Sebastian Inlet, Florida to Altamaha River, Georgia	Winter calving grounds

Source: Refs. [9,16,17].

minimum of two right whale deaths per year is attributed to vessel-strikes [4,11,12]. From 1970 through 1998, 35% of known right whale deaths and 56% since 1991 were attributed to ship strikes [11,19–21]. A recent report [22] documents that of the 66 right whale deaths reported from 1970 to 2004, 23 were due to ship strikes. Most recently, Kraus et al. [4] summarized that over 16 months, eight right whale deaths were reported, six of which were females carrying fetuses. Three, and possibly four, of these whales were killed by ship strikes, one was killed by gear entanglement and the rest were undetermined [4]. The deaths of the females represent a reproductive potential loss of as many as 21 animals [4]. Although reporting and detection capacities of right whale deaths have improved since 1991, the technology and information gathering abilities have not been fully realized and thus, injuries and deaths due to ship-strike are likely more frequent than currently estimated [20].

Brown [19] outlines the main reasons for right whale vulnerability to ship strikes. Right whales are difficult to see as they are overall black, they do not have a dorsal fin and they spend a considerable amount of time displaying various behaviors, such as “logging” at or near the surface of the water [19]. Right whales engage in social behavior that may impede their awareness of an approaching vessel and appear to be easily approachable when engaged in courtship. Although aggregations of right whales may be more noticeable by vessel operators, other conditions such as speed of vessel at the time of sighting, climate, time of day, etc. may prevent the vessel operator from avoiding groups or individuals [23]. Noise may also play a role in the lack of response to approaching vessels; frequency sensitivity, interference and echoing, and masking and shielding are factors that can deter sound from the hearing range of right whales [24].

## 2.3. Right whales in Canadian waters

Seasonal habitat fidelity (feeding and otherwise) of right whales in the North Atlantic is documented in Canadian waters in the Grand Manan Basin region of the Bay of Fundy and Roseway Basin on the Scotian Shelf and in three other regions in American waters [9,16]. Table 1 displays the life history roles of these “critical” habitats to the right whale. Baumgartner and Mate [16], and others before them (e.g. [24]), relate the distribution of feeding habitats of right whales to their primary prey, a calanoid copepod *Calanus finmarchicus*. Baumgartner and Mate [16], however, demonstrate a peculiar pattern. Right whales remain closer to areas characterized by low bottom temperatures ( $T$ ), and high surface salinity ( $S$ ) and stratification ( $\Delta\sigma_t$ ) rather than areas characterized by a high abundance of *C. finmarchicus*. As there is a plethora of  $T$ ,  $S$  and  $\sigma_t$  data resolved at time and space scales, relative to the paucity of zooplankton abundance estimates, oceanographic conditions may be the best predictor of right whale distribution within their known feeding

grounds [16]. However, there is a large degree of uncertainty in determining the location of whales outside their known feeding grounds (e.g. during migrations).

#### 2.4. Contemporary management status of right whales in Canada

Canada has not specifically included the right whale in its recent action and strategic plans that address marine environmental conservation and protection (e.g. [25,26]). However, existing legislation, guidelines and international agreements stipulate that Canada has the responsibility to protect marine resources and biodiversity. For instance, Canada is party to the 1982 *United Nations Convention on the Law of the Sea III* (UNCLOS), which entitles signatories to establish marine protection measures and areas in territorial seas based on *oceanographic, ecological conditions and vulnerabilities* [27,28]. Moreover, Canada's obligations to the *Convention on Biological Diversity* [29] compels the nation to establish and promote protection of *ecosystems, natural habitats, and populations* [30]. Nationally, Canada has pledged, with federal mandates and legislation (*Oceans Act* [31], *Species at Risk Act* [32]), to establish management of marine habitat and protection of endangered species. However, none of these guidelines, agreements or legislation specifically address vessel collisions with right whales.

Environment Canada classified the right whale as endangered under its *Species at Risk Act* (*SARA*) Schedule 1 in 2003, which complements the IUCN's listing in 1994. Under section 32, *SARA* stipulates that it is an *offence to kill, harm, harass, capture, or take* any North Atlantic right whale. Furthermore, under section 33 *SARA* prohibits damage or destruction of the habitat of any listed species, including the right whale [32,33]. However, Vanderzwaag and Hutchings [34] explain that activities subject to the prohibitions of sections 32 and 33 are not clearly defined and any legal action would be a lengthy and subjective process. No cases have been brought before a court related to the disturbance, injury, or death of a right whale or damage or destruction to their habitat under the provisions of *SARA*. Prior to the official recognition of the status of the right whale in Canadian waters through *SARA*, the *Canadian North Atlantic Right Whale Recovery Plan* was released in 2000 as a collaborative and co-sponsored effort between Fisheries and Oceans Canada (DFO) and World Wildlife Fund Canada [23]. The *Recovery Plan* was a "blueprint" to improve the North Atlantic right whale's chance of recovery with the goal of reaching a target population of 1200 individuals. The "Plan" has no legislative authority and there are no legal requirements or provisions that oblige Canadian federal departments to allocate resources to carry out the 46 recommendations delineated under the plan.

Currently, the DFO can apply the *Oceans Act* [31] to establish marine protected areas (MPAs) for marine mammals, although no protected areas for the North

Atlantic right whale have been established. DFO is also responsible for the *Marine Mammal Regulations* under the *Fisheries Act* [35], which allows the Minister to charge anyone for disturbing or deliberately killing a marine mammal without a permit. Commercial shipping activities have yet to come under the scrutiny of the *Marine Mammal Regulations*, perhaps because the regulations do not clearly define which human activities may be deemed as disturbing a marine mammal [34].

Environment Canada is the overarching federal department responsible for *SARA* under which a recovery strategy is required for every species listed under Schedule 1. However, also under *SARA*, DFO is responsible for the conservation and protection of aquatic wildlife deemed to be at risk, and is accountable for enforcing regulations pertaining to their protection [32]. The competent Minister is provided the discretion to choose the contents of a recovery strategy in terms of regulations and management approaches (e.g. ecosystem or species-specific, individual or team involved, etc.). Additionally, section 46 of *SARA* requires reporting of the progress of the strategy in 5-year increments. An official *SARA* recovery strategy for the right whale is yet (at the time of writing) to be released.

Environment Canada's Parks Canada Agency also has the legislative power to protect right whale habitat by enacting the *National Marine Conservation Areas Act* [36]; however, no such conservation areas allowed under the Act have been established for the right whale. However, in 1993, DFO (rather than Environment Canada) defined two primary critical habitat areas for the right whale in Canadian waters, the lower Bay of Fundy and Roseway Basin, as "conservation areas" [23]. No legislation followed to ensure protection of the defined habitat and the critical habitat areas remain little more than lines with notations on nautical charts. It is thus apparent that Canadian authorities with the explicit responsibility to address marine conservation needs have failed to develop a clear and enforceable management strategy for the right whale and its habitat.

Leadership in marine conservation and protection is ultimately the responsibility of the DFO. Recent strategic documents and coordinated efforts by the DFO perhaps show the greatest potential for the protection of right whales and their habitat. Canada's *Oceans Act* requires the Minister of DFO to develop and carry out a national strategy based on the principles of sustainable development, integrated management and the precautionary approach [31]. *Canada's Ocean Strategy 2002*, reflects policy direction for the various management activities required by the *Oceans Act* [31,37]. The strategy was developed to address Canada's economic, social and environmental interests in ocean resources. The strategy stresses the principles of the *Oceans Act*: management of Canada's marine resources should be integrated to accommodate the numerous sectors that rely on marine resources and built upon the premise of sustainable development. The *Policy and Operational Framework for*

*Integrated Management of Estuarine, Coastal and Marine Environments in Canada* [38] provides a model for the implementation of the integrated management principle set by the *Oceans Act*. Both the *2005–2010 Strategic Plan: Our Waters Our Future* [26] and the *Oceans Action Plan* [31] recognize that unhealthy oceans can be characterized by an increasing number of marine species at risk for which DFO assumes explicit responsibility for conservation and protection. Currently, MPAs represent the only tool with which the integrated management process (at least according to the principles of the Canadian government) can address all sectors of ocean users and environmental aspects (e.g. species and habitats), including shipping and right whales. The general approach to MPA management is outlined in the *Marine Protected Areas Policy* [39], the *National Framework for Establishing and Managing Marine Protected Areas* [40], and more recently the *Federal Marine Protected Areas Strategy* [41]. Unfortunately, all three policies point to a lengthy process to establish an MPA that will likely make the realization of MPAs difficult in Canada. There are exactly five MPAs in Eastern Canada [42], none of which are specific to the endangered right whale and in areas listed in Table 1.

Curiously, Transport Canada (the department with the responsibility to address shipping activities and independently of marine protection) showed recent leadership in conservation of the right whale. Transport Canada regulates large vessel traffic through either policy directives handed down to the Canadian Coast Guard (CCG) or by enforcing the *Canada Shipping Act 2001* [43] and other related acts. CCG advisories, notices to mariners and other shared information are frequently delivered to vessels approaching the Right Whale Conservation Areas (e.g. Lower Bay of Fundy and Roseway Basin) by the Marine Communications and Traffic Services (MCTS). Interestingly, the MCTS operated by the CCG is a branch of DFO, yet the policies and mandates are provided through Transport Canada. Generally, national protective measures that would be enforced by CCG beyond the 12 nautical mile (nm) limit require the endorsement and support of the international community. As a signatory to the International Maritime Organization (IMO), Canada requires its approval for sanctioning any restrictive measure imposed on vessel traffic outside federal jurisdiction and within its Exclusive Economic Zone (EEZ) [19,28]. In 2003, a team led by academic and non-governmental organization researchers and Transport Canada successfully secured IMO approval for moving the Traffic Separation Scheme in the lower Bay of Fundy that intersected the right whale feeding and nursery habitat area [44].

### 3. Shipping

#### 3.1. General shipping trends

Over 90% of commercial exchange in terms of tonnage is performed via seaborne trade and current trends indicate

that commercial shipping will likely continue to increase [45]. Various sources (e.g. [46,47]) assume that both size and capacity have yet to reach full potential. Ships with capacities over 2500 TEU (20 ft equivalent units; imperial measure) were designed to accommodate the width of the Panama Canal to a maximum of 4500 TEUs and were desirable to shipping interests in the past [48]. However, these had poor performance relative to those of 7000 TEUs constructed for Asia–Europe and Europe–North America economic trade routes [48,49]. Design and development of Ultra Large Container Ships' (ULCS) of 12,500 TEUs is currently underway [49]. The impetus for increasingly large ships is due mainly to decreased costs at sea per tonnage as ship size increases; however, voyage time is always the limiting factor [48,49]. Transit and dock time factor into average costs of freight and shipping companies seek to minimize both to save on overall operational costs.

#### 3.2. Operationalization of shipping in Canada

A brief and simple summary of the political and legal responsibilities for shipping activities in Canada is provided here. As a member nation of the United Nations and signatory party to UNCLOS and the IMO, Canada has agreed to respect the law of the sea and national responsibilities as delineated by the IMO. UNCLOS defines a state's jurisdiction regarding implementation of IMO regulations [50], though IMO is not responsible for regulating the jurisdiction of a coastal state. However, IMO is responsible for approving a regulation set by a coastal state. The freedom of navigation is protected in UNCLOS but the right of navigation varies and coastal states must adhere to their own specific legislation. For example, UNCLOS clearly states that routing measures planned by coastal states shall not supersede international law, and sea lanes and traffic-separation schemes must be planned according to IMO's recommendations. Also, routes cannot be unjustifiably redirected by coastal states [50,51]. While coastal states can impose area-specific restrictions to vessel traffic for reasons concerning safety or for protecting the marine environment, the right of innocent (i.e. non-threatening) passage of vessels remains protected under the stipulations of UNCLOS. For example, France and Italy attempted to restrict vessel passage through a jointly administered International Marine Park in the Strait of Bonifacio between Sardinia and Corsica. The right of transit passage was protected by UNCLOS and France and Italy were forced to apply for a Resolution of the IMO that urged foreign governments to prohibit or strongly dissuade their ships from carrying dangerous substances through the protected area [28].

Importantly, Spadi [28] cautions that once IMO accepts a proposal for area-specific management such as a Particularly Sensitive Sea Area (PSSA), other nations are bound to comply on a "should" basis. Consequently, many of IMO's provisions for marine conservation and protection, such as a PSSA, are not legally binding and the onus



lies on the coastal state to enforce its own set of regulations or enter into a compendium of treaties. The above example specifies the general operational premise of UNCLOS and the IMO: that ships can only be excluded from traveling through a state's waters by signed agreement or formal recognition by affected nations on condition that the freedom of navigation is guaranteed in some part of a nation's EEZ [28,52].

Commercial traffic through the coastal waters off the provinces of New Brunswick, Nova Scotia and Newfoundland includes container vessels, tankers, bulk carriers and other particular types of cargo carriers such as Roll-on-Roll-off. Vessel traffic affiliated with oil and gas exploration, Canadian Department of National Defence, foreign naval fleets and research may also traverse the coastal waters of the North Atlantic. Canadian shipping policy is regulated by Transport Canada and legislation addresses a complex range of matters related to safety and health, communications, freight, infrastructure, manning, registration, accidents and equipment and supplies [53].

Canada is limited in its autonomy and decision ability related to shipping matters in its waters by being a signatory to the IMO and UNCLOS. Fortunately, Canada has been the stage for a series of precedent-setting cases in international law that demonstrate a nation's ability to act according to its own principles. The 2003 IMO sanctioned Bay of Fundy shipping lane to reduce the probability of ship-strikes on North Atlantic right whales in one of their primary summer and feeding habitats was a unique and unprecedented event. Furthermore, Canada lobbied for an "arctic exception" during the UNCLOS negotiations to secure provisions already established by the national *Arctic Waters Pollution Prevention Act*, which delineated Canadian jurisdiction over ice-covered waters for 100 nm offshore [54]. Moreover, the "turbot war" with the Spanish trawler fleet near Canada's 200 nm EEZ shows that Canada is not only willing but able to protect its natural resources according to its own legislation and conservation interests, despite potential prosecution by the international community [55].

#### 4. Emerging encounters

##### 4.1. *The dichotomy of economic opportunities and environmental protection*

UNCLOS recognizes that the problems occurring across the world's oceans are not detached from each other and the marine environment needs to be considered as one region [56]. A dichotomy emerges from the obligation to uphold economic prerogatives in the form of freedom of navigation (and "navigation" is not necessarily equivalent to "shipping") versus the obligation to protect and maintain biological diversity in the marine environment. Although regulations, standards and tools are available to conserve the marine environment and preserve the right to innocent passage, the Canadian government has not

provided a single combining and guiding document that addresses, compares and weighs both, though there are analogous issue-specific policies that achieve such a goal. For example, DFO has considered the effect of seismic sound on marine mammals and recognizes that exposure to seismic surveys is potentially harmful, although direct effects are largely unknown [57]. DFO recognizes that the ecological significance of seismic effects would be elevated if feeding marine mammals are displaced from regions where there are no alternative sites the animals can frequent. In the same context, it is not unreasonable to assess the ecological impact of commercial shipping activities in waters frequented by right whales as being considerable, since alternative areas for whale feeding and nursery grounds in Canadian waters are not known to exist outside the lower Bay of Fundy and Roseway Basin. It is well known and documented that shipping threatens the continued existence of right whales in the North Atlantic. Thus, an overarching legislative system that addresses marine protection, including the right whale, and commercial shipping is urgently needed to guide national directives.

Complete and enforceable provisions and protection techniques for the marine environment have yet to emerge either from the international community or from Canadian federal authorities. Discussions have arisen from both that address area-specific management for protecting and conserving the marine environment. For example, UNCLOS provides that nations have the right to manage living and non-living resources within their EEZ and offers Special Areas under MARPOL 73/78 or Traffic Separation Schemes, Particularly Sensitive Areas, Precautionary Areas and Deep-Water Routes under IMO Guidelines. In addition, the CBD offers technical advice on establishing and managing marine and coastal protected areas. Area management is also referred to by DFO as an initiative the department wishes to fulfill by establishing a definite number and a set network of protected areas managed autonomously. Additionally, representative conservation areas are viewed by Environment Canada as essential management tools to ensure Canada's commitments to preserving biodiversity.

##### 4.2. *Limitations of the sole use of area management*

While area-specific management offers a theoretical promise to conserve and protect the marine environment, several key problems emerge when applied to the right whale. Uncertainty in area design, connectivity of areas, sink-source dynamics and other variables related to protected area modeling [58] do not offer the immediate solution to improving the chances of right whale recovery as ship-strikes can occur inside and outside protected areas. Moreover, threats to protected areas include inadequate resource management, inappropriate internal development, mining and prospecting, and military activity [59]. Furthermore, area management requires specific regulations, ensuing compliance and enforcement to ensure the

boundaries are respected by zoning provisions or by full closures. More importantly, area management does not afford the same protection for migratory species, such as the right whale, as for sedentary species found within the protected area boundaries. Some authors suggest delineating 50–90% of a population's habitat for species protection according to their biophysical patterns and life histories [60]. However, setting protection boundaries for the entire range of right whale habitat may not be practical. A concerted and dedicated effort from Canadian and American authorities and representatives from the international shipping industry is required to set and enforce boundaries of future protected areas for right whales. Achieving such a goal requires time for discussions and bilateral agreements, but with enough political will coupled with the acknowledgment that right whales need immediate attention, the chances for recovery of the population are likely increased.

#### 4.3. *A need for a right whale management strategy*

An explicit management strategy is needed in Canada to address right whale mortality due to ship-strikes. The presence of conservation areas, which are aimed at minimizing vessel interactions with right whales, should not be the only tool used to protect the right whale. The challenge remains to effectively maintain all ecosystem characteristics in time and space. Immediately addressing this issue thus necessitates a predictive, synchronized and monitored management system that, for example, statistically determines the best route for a vessel traveling in areas where right whales are expected and accordingly advises vessel operators.

Speed limits for vessels may be one measure to decrease the frequency and severity of ship-strikes on right whales. Laist et al. [20] discuss that most severe and fatal wounds experienced by whales occur when vessels travel at 14 knots or more. Vanderlaan and Taggart [18] explain that acuteness of injury to right whales is directly proportional to the speed of the vessel and demonstrate the relationship as follows: 80% rate of injury at 15 knots, 50% rate of injury at 11.8 knots and 20% rate of injury at 8.6 knots. Correspondingly, the *National Oceanic & Atmospheric Administration of the U.S. Department of Commerce*, has proposed a speed limit of 10 knots for vessels traveling in areas (and at times) where they are likely to encounter a right whale [18,62]. Kite-Powell and Hoagland [61] performed calculations based on vessels traveling at 10 knots for 25 nm through a seasonal management area for 60 days. The authors predict that all vessel types would experience an increase of less than 0.5% of total operating costs. This calculation represents a small fraction of the compensation that eventually consumers would pay to receive their goods. In essence, reasonable management measures may not impact the shipping industry as significantly as once thought.

Currently, data are available, including historical, for both vessel density and right whale abundance that can

serve to apply statistical and probabilistic modeling efforts around calculating the best speed and angle for voyage planning. Laist et al. [20] agree that vessel operators can be provided with live information about right whale movement via instruments such as sonobuoys along shipping lanes. Vanderlaan et al. [63] provide similar insight in their discussion of right whale sound characterization. Passive acoustic systems are promising tools for collecting right whale spatial distribution data [63]. Laist et al. [20] also agree that ship captains, pilots and officials can log and report sightings and collisions to proper authorities for immediate follow up, including notification of other mariners in the area.

If Canada is committed to upholding its national pledges to protect marine species at risk (as demanded by *SARA*) then government bodies must make full use of existing resources through legislation and strategic documents given the urgency in mitigating ship-strikes on right whales. For example, MCTS Officers are provided with a legal provision in the *Canada Shipping Act 2001* with the right to direct vessel traffic away from animals. Also, while drafting the future initiatives of *Canada's Oceans Action Plan Phase II* under the *Oceans Act*, DFO can identify the means of mitigating threats from vessels to right whales as a priority under the *Health of the Oceans* pillar and subsequently implement solutions.

## 5. Conclusion

The management of encounters between endangered right whales and large vessels is a difficult yet feasible task. Minimizing the probability and lethality of vessel-strikes is a necessary step in supporting the recovery of the North Atlantic right whale population. Historically, Canadian management efforts directed at the protection of right whales, their habitat and minimizing vessel threats to whales have been weak or non-existent. However, this continued complacency on the part of regulators is not acceptable at this point as increasing shipping and contemporary strikes statistics indicate that vessel-strikes to right whales are unlikely to decrease. Canadian authorities have the mandates and legal provisions to develop a management system that reduces the likelihood of vessel-strikes while respecting the freedom of navigation of vessels in Canadian waters. Specifically, DFO has the appropriate legislation and regulatory tools to assume responsibility for aquatic endangered species and marine environmental protection. The *Oceans Act* provides the mandate to protect areas and endangered species with regulations pertaining to environmental quality requirements and standards while considering the requirements of other ocean users (e.g. shipping). Additionally, the *Fisheries Act* provides specific marine mammal regulations that allows prosecution of those activities causing unduly harm to marine mammals. In accepting its role as the lead federal authority for marine endangered species and environmental protection, DFO can initiate management

practices to ensure good governance in the face of uncertainty. Subsequent to the implementation of an operational and committed management strategy for the right whale, Canada can assure the international community of its commitment to preserving biodiversity and ecosystem health.

### Acknowledgements

Funding in support of S.S.E. was provided by an Environment Canada Habitat Stewardship Program grant to C.T.T. Many thanks to J. Michaud, A. Vanderlaan, N. Helcl, and G. Herbert for help and critical appraisal.

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