

# Creating Meaningful Marine Protected Areas in Canada

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## Abstract

This paper follows from the work "Status and Aspirations of Marine Protected Areas in Canada" also published in this journal.

## Keywords

Marine protected areas — Canadian environmental policy — Aichi Target 1

## 1. Current State

Marine protected areas (MPAs) were first established in Canada's waters to preserve important scenic wonders and tourist attractions (Lemieux et al., 2011). While these objectives are still in mind, the focus has evolved to concentrate on ecological sustainability and biodiversity conservation; hopefully simultaneously reaching the much anticipated 10% coverage target, agreed upon in the Convention on Biological Diversity in 2011. More specifically, this target looks to federally protect 10% of Canada's water bodies from harmful natural and anthropogenic impacts. Currently, less than a mere 1% of Canada's oceans are considered protected by an MPA, which has been established as insufficient (CPAWS, 2015 and Mackinnon et al., 2016). The goals set forth require a far greater input of time, financial resources, research and compromise to be considered fully effective (Lemieux et al., 2011). Instead of being catalysts of conservation in the protected areas, many of these parameters are working as constraints, preventing MPAs from reaching their full intended potential (Lemieux and Scott, 2011).

The current state of MPAs in Canada have been deemed as less effective than required to maximize the ecological, social and economic benefits that have been proven to be a result of well-planned and managed areas (Lopoukhine, 2013). As recognized in a previous paper of this series, Effectiveness of Canada's Marine Protected Areas, there are five shortcomings which are thought to contribute to the current state. These shortcomings are (1) MPAs that by virtue of their small size or poor design are ecologically insufficient; (2) MPAs that fail due to the degradation of the unprotected surrounding ecosystems; (3) inappropriately planned or managed MPAs; (4) MPAs that do more harm than good due to displacement and unintended consequences of management; and (5) MPAs that create a dangerous illusion of protection when in fact no

protection is occurring (Agardy et al., 2011 and Lopoukhine, 2013). As such, superior methods of design, management and evaluation must be implemented to address each of these shortcomings. This paper will discuss the challenges and opportunities that are, and may be, faced in confronting each of the issues in optimizing the effectiveness of Canada's MPAs.

## 2. Major Shortcomings

### 2.1 MPAs that are poorly designed

MPAs are implemented to address specific conservation problems and to attain certain objectives which justified their designation. When an MPA is too small, or not covering crucial boundaries such as the full home ranges or spawning grounds of the species of interest, the goals are very unlikely to be achieved (Fox et al. 2011). Regardless, if the designation of an MPA is striving to maintain or enhance the conservation status of flora, fauna or unique geological features, planning of the area must account for movement and stochasticity in such systems (Fox et al. 2011). The life histories of inhabiting organisms and features must be well researched. When knowledge of the target is relatively unknown, preservation must take place with caution on the side of conservation; giving targets greater protection than maybe necessary. However, blindly hoping that generous conservation boundaries and regulations are sufficient, is not enough to ensure effectiveness.

For instance, even one of the largest MPAs in Canada, the Gully (NS) is falling short of its conservation objectives because of a lack of proper planning and understanding (CPAWS, 2015). The Gully was designed to conserve a wide range of species and habitats, from deep sea corals to the critical habitat for northern bottlenose whales, *Hyperoodon ampullatus* (CPAWS, 2015). With an area of 2364 km<sup>2</sup>, the area is set to minimize ship collisions with the region's cetaceans. However, based on extensive surveys conducted in and around the Gully, it was stated by Hooker et al. (1999) that efforts were not sufficient, showing the current area not

protecting the cetaceans from other impacts of shipping and fishing, such as noise, dredging and chemical pollution. With this information, it was recommended to DFO that an isobath of 20m, buffer zone of 20km and core protection zone be implemented (Hooker et al., 1999). These suggestions have not been established, and thus the Gully falls short of meeting its conservation goals due to improper design (CPAWS, 2015; & WWF, 2016).

Ideally, each proposed MPA should undergo thorough investigation to determine an optimized design for the area, preventing a lack of long-term conservation or future need to alter the area. Even with a diligent planning and design process, many factors can be overlooked. While this itself is an issue, an even greater problem is the difficulty to address and mend these shortcomings upon discovery. Altering sites to become more effective requires the policies and laws surrounding this change to be more flexible. It is helpful that the policy is arduous to change once implemented, preventing the lobbying or bribing of officials to move or decrease the size of MPAs, benefiting industrial and commercial activities (Lemieux et al., 2011). However, it is not necessary to prevent the expansion of any MPA with sound research backing.

## 2.2 MPA degradation due to unprotected surrounding ecosystems

Regulations and management regimes inside marine protected areas are important, but alone cannot achieve the necessary level of protection to be effective. Further protection is crucial in non-protected areas, both in marine and land based regions. Impacts from human activities can pass into the MPA boundaries freely, damaging the health of habitats and organisms (Lemieux et al., 2011). Noise pollution, eutrophication effects, ecological imbalances, changes in water temperature and chemistry are some of which have the greatest degrading effects (Lemieux et al., 2011). These seemingly outside challenges have heavy effects on many MPAs, including the Gully, just off the coast of Nova Scotia. The habitat of included cetaceans are subject to loss and degradation due to noise, dredging and chemical pollution, causing range changes and population declines (Hooker et al., 1999). Much less complex organisms are as equally impacted by these outside sources of impact. Rare, deep sea sponges are threatened by loose sediments from dredging. The sediments are taken by currents and deposited on coral beds, suffocating them until clean currents wash them away, from which they are not always able to rebound (Agardy et al., 2011).

It is important to have knowledge of target organisms and activities that occur inside the MPA boundaries, but it has been proven equally as crucial to have an understanding and jurisdiction of processes that take place outside of the boundaries (Agardy et al., 2011). This would allow MPAs to be more effective largely in environmental terms, but as well economically and socially. International studies have shown the

effectiveness of this approach in numerous countries. Case studies from Papua New Guinea show that when well researched, allowing the government to have more authority over surrounding areas is both necessary and achievable (Green & Lokani, 2004). With more authority, the government takes on more responsibility in protecting the ecological features, as well as properly representing the needs of surrounding communities and industries. As such, a greater research and monitoring is required from the government, eliminating the concept of “blind trust” in the MPAs (Green & Lokani, 2004). It is recommended that Canada, and specifically DFO, research and adopt a similar strategy to eliminate this challenge.

## 2.3 Inappropriate planning and/or management

Insufficient planning can prevent an MPA from being successful, even prior to its implementation. In some cases, more harm is done with an improperly planned MPA than good. The most common factor that leads to this phenomenon is the lack of stakeholder involvement in any steps of MPA planning (Agardy et al., 2011). Stakeholders have the most accurate idea of the activities that take place in the area. As a result, they are the most valuable resource in determining the types and extent of regulations, monitoring and enforcement that should be planned. The importance of this was quickly seen when planning for the newest MPA, Anuniatqvia Niqiqyuam (Darnley Bay). Planners neglected to involve the small communities and stakeholders, who are reliant on the areas natural resources, in the full planning process (Daoust et al., 2014). It was first recommended by planners to eliminate all levels of fishing throughout the entire MPA, but was quickly changed when stakeholders were informed (Daoust et al., 2014). This is one of numerous cases where MPAs are viewed as being imposed on locals by “outsiders”, with little knowledge or regard for what should be occurring instead (Ban et al., 2014). This disrupts the socio-economic stability of coastal communities, and can result in turmoil between the locals, authorities, and project planners (Ban et al., 2014).

To avoid further pitfalls such as this, Canada should adopt planning and management protocols similar to Malaysia, whom have some of the most effective MPAs to date (Masud et al., 2017). Malaysia’s approach to implementation and management looks to actively maximize the community’s participation in all steps. The residents and stakeholders are not only invited and encouraged to participate, but it is somewhat of a requirement for the government to obtain approval and contributions from these parties (Masud et al., 2017). This allows for appropriate planning for the areas and community’s needs. Further, management and enforcement would be implemented with greater ease. Unlike in some of the current Canadian MPAs, locals would be much less likely to feel the protection is being imposed by outsiders or authority, and instead welcomed.

## 2.4 MPAs that cause displacement or other adverse effects

Tighter regulations and closures within MPAs have the potential to increase the pressures of human activities outside of the areas borders, depleting the benefits of the conservation efforts (Agardy et al., 2011). It has been previously proposed that the closures of extensive fishing inside MPAs will cause a spillover into surrounding sites, where additional fishing pressures can be withstood (Murawski et al., 2000; & Robb et al., 2010). However, few results of monitoring and research programs have proven this effect (Robb et al., 2010). The pressures remain high, where the spillover seldom increases. This displacement presents consequences for not only the environment, but also for the fisheries and communities that must concentrate their efforts on resource poor areas (Robb et al., 2010). This can lead to economic loss and often conflict between parties competing for the same limited resources (Murawski et al., 2000). Results such as these are not limited to fisheries; tourism, vessel traffic, oil and gas exploitation, and dredging and dumping are all at risk of being concentrated outside of MPAs, potentially doing more harm than good in the area.

Perhaps the best-known result of this shortcoming in Canada is seen on the East coast, around MPAs such as the Gully, Saguenay-St. Lawrence, and American Bank. Since the collapse of Cod in 1992, fishing efforts have been transferred to other species such as haddock, halibut and lobster (DFO, 2017; & Pershing et al., 2015). A target concern of these MPAs remain centered around the rebound of Cod stocks, but neglect to protect and monitor these various other species of interest to a necessary degree (Lindholm et al., 1999). Commercial fishing is still permitted inside some of the MPA boundaries, as well as outside (WWF, 2015). Not only have some of the fisheries been displaced to secondary areas, but to different species. While their populations may currently be strong, as the Cod stocks once were, better methods of deferring fisheries must be adopted.

To optimize these methods, Canada can look to examples put forth by Madagascar (Rakotoson & Tanner, 2006). When particular ecosystems or species become of special concern, the nation places a moratorium and conservation efforts into practice in multiple trophic levels. It is realized that in marine systems, all organisms are connected. Conserving seemingly unrelated areas and species has shown to have beneficial effects on the target species and zones (Murawski et al., 2000). To achieve such a goal, very heavy regulations are placed for short periods of time, but are normally followed by plentiful sustainable harvests (Murawski et al., 2000). These nations also pay a great deal of attention to their fishing efforts and practices; keeping them relatively small scale and maintainable is a priority. This non-traditional management method prevents marine resources from being viewed as centralized assets (Rakotoson & Tanner, 2006). It is stated, and enforced, very clearly what is allowed and prohibited in protected areas

and the smaller zones of conservation within. Aggressive conservation goals have been met with such methods while keeping socio-economic peace (Rakotoson & Tanner, 2006).

While Canada is a much larger nation, such aggressive closures and timelines may not be as feasible. However, the concept that marine species are parts of larger ecosystems which also require protection should be better adopted. Greater buffer-zones and stronger management outside MPA boundaries needs to be implemented. Further, a stronger use of sustainable practices should be implemented and celebrated, lessening the need for such aggressive closures and strong regulations.

## 2.5 The illusion of protection in MPAs

Each of the four previous shortcomings contribute to the illusion that protection is occurring, when in fact it is not. This misconception leads to a major shortcoming by itself. While not the intention of DFO or MPA managers, the public can be misled to believe the designation of an MPA automatically translates into protection (Ban et al., 2014 and Eddy, 2014). The image of MPAs can be distorted in two ways, where 1) the protection standards are not transparent to the public; and 2) the MPA area has been chosen for the wrong reasons (Eddy., 2014). A lack of transparency can become problematic as issues in MPAs are discovered. The public's views of MPAs are clouded, leading to a perceived loss of clarity, faith and trust. In turn, decreasing public backing and funding when an MPA requires it to fix the issue.

Additionally, MPAs can be picked due to their ease of implementation and management. This issue is especially apparent in Canada, as the Northern waters are exploited to a much lesser degree (Hodgson-Johnston, 2014). Placing a large MPA in the arctic can seem ideal, as it allows Canada to be closer to the goal of successfully conserving at least 10% of coastal marine areas, while having little socio-economic costs. Currently, Lancaster Sound, a proposed MPA is to be implemented in Northern Nunavut. The area is planned to account for 48,000 km<sup>2</sup>, almost the same size of all Canadian MPAs combined (WWF, 2016). As such a remote and large location, involving all small communities and effectively managing the site will be nearly impossible with Canada's current resources. It is also in question if resources would be better allocated to sites in greater danger of exploitation, such as sites off the coast of British Columbia and the Yukon, which are subject to greater fishing and oil development pressures (Ban et al., 2014).

To ensure this shortcoming does not grow further, Canada must look to represent each of the twelve bioregions to some degree, with an emphasis on highly threatened areas. For this to occur, greater monitoring and research is required in current MPAs, determining where and with what methods are of the greatest use.

### 3. Moving Forward

In theory, and in looking at numerous other nations, the benefits of effective MPAs are clear and seemingly endless. However, the state of Canadian MPAs have much to change before they are collectively considered as meaningful as required. To address the major shortcomings the following recommendations are offered: 1) the ability to better modify current MPAs in the side of conservation; 2) stricter local, provincial and federal jurisdiction outside of MPAs; 3) emphasis on local education and involvement in all areas of MPAs; 4) use of marine spatial planning and sustainable resource use beyond MPA boundaries; and 5) representation of all bioregions and highly threatened areas in MPA designation.

The effective designation and proper management of such sites is not proposed to be a simple task, even if the previous recommendations are met. With a clear desire and need for a greater quality and quantity of MPAs, Canada is on track to meet the minimum goal of 10% MPA coverage. Optimizing this goal is a greater task than what may currently be perceived, where much is yet to be learned and gained. This learning curve can be maximized by reflecting on and relating Canada's shortcomings with the effectiveness of other nations relating to similar issues, and more importantly making changes as seen fit for our own .

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