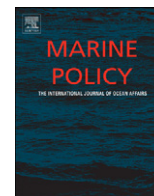




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## The International Plan of Action for Sharks: How does national implementation measure up?

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### ABSTRACT

Various species of sharks, skates, and rays continue to decline globally, demonstrating a greater need for effective conservation measures. In 1999 the Food and Agriculture Organization (FAO) developed comprehensive guidelines in its International Plan of Action for the Conservation and Management of Sharks (IPOA-sharks), which was followed by corresponding national plans in some nations. A case study of national implementation is presented here. Specifically, progress under Canada's National Plan of Action for Sharks (NPOA-sharks) is reviewed, against its stated goals, against Australia's NPOA, and against the original FAO guidelines. For comprehensiveness, additional management and conservation measures for sharks, as well as stakeholder input from the first Atlantic Shark Forum is provided. Although Canada is recognized as a leader in shark management, as it was one of the first countries to develop an NPOA, it has not effectively adopted the FAO's principles and guidelines. The plan lacks set timelines, priorities, and action plans to mitigate threats to sharks, and contains no performance indicators. Additionally, the plan neglects to identify priority species and engage stakeholders, and cannot be directly linked to management measures. To advance the revision of this plan (as well as other NPOAs), a stepwise process is recommended that includes (i) stakeholder engagement and development of a shark assessment report (SAR) (ii) addressing all IPOA objectives, while prioritizing issues arising from the SAR, and (iii) implementations of actions, targets, and timelines that are reviewed every four years. Key policy items to advance Canada's role in shark conservation and management are also presented. These include actions to improve data collection and research, management, and education, as well as coordination with stakeholders. In conclusion, major changes are needed to the existing NPOA to be fully effective and accountable. Likewise, the abovementioned measures may help guide more proactive plans in nations that have not yet established an NPOA.

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### 1. Introduction

Sharks, skates, and rays, collectively referred to as elasmobranchs and often referred to as 'sharks' in academic literature, have roamed the oceans for over 400 million years [1,2]. However, a rising demand for shark products such as fins and meat has fueled new types of fisheries, jeopardizing the survival of many populations [3]. Sharks are believed to be globally under threat and are poorly represented in most fisheries management plans. In addition, due to a lack of or poor-quality data, stock assessments are rarely available and total mortality estimates are difficult to obtain, as they should include estimates of shark bycatch, discards, and landings [4]. Lack of effective management

and stock assessments, unreliable catch and trade data, and lack of political will and resources to manage and protect these animals, have contributed to the demise of shark populations worldwide [5]. In Atlantic Canada, 42 elasmobranch species have been reported, and over half, mostly sharks and skates, are globally considered near threatened, vulnerable, or endangered by the International Union for the Conservation of Nature (IUCN), and face varying risks of extinction [6]. Approximately 19 species of sharks have been reported in Atlantic Canada, of which half are considered vulnerable to extinction by the IUCN, and of the 14 species of skates listed, 4 are considered endangered, implying that these species face a very high risk of extinction in the wild [6].

To understand the issues surrounding sharks in Canada, Godin and Worm [7] examined the overall state of knowledge of sharks across Canada and identified several best practices and management measures, related to shark finning, bycatch and discarding of sharks, as well as legislation to list priority species for

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conservation. Yet they do not assess in depth Canada’s adoption of the International Plan of Action (IPOA-sharks), which represents the only international framework for conserving and managing sharks. Here, Canadian policy is used as a case study to focus specifically on the success of the IPOA to improve the assessments and management of sharks. As this plan is up for review in Canada in 2012, this research is also intended to support the Department of Fisheries and Oceans (DFO) in the upcoming revision process.

Recognizing the urgency of collecting and improving data on sharks, the Food and Agricultural Organization (FAO) developed and implemented the IPOA-sharks in 1999 [8]. The plan aims to ensure the long-term conservation and management of chondrichthyan fish (sharks, skates, rays, and chimaeras, herein referred to as ‘sharks’ unless otherwise stated), across all shark-fishing states, foreign vessels fishing within a States Exclusive Economic Zone (EEZ), or states whose vessels fish for sharks on the high seas. The plan aims to safeguard sharks through improved data collection and research; implementation of action plans to mitigate threats to sharks, identification of priority species for conservation, and development and implementation of education and collaborative consultation initiatives [8]. Although voluntary, the IPOA-sharks acts as a guideline from which states can design, implement, and monitor a National Plan of Action for Sharks (NPOA-sharks), and any subsequent Regional Plans of Action (RPOA) [8]. Likely due to its non-binding nature, the development of NPOAs has been slow [9,10]. A compounding problem is the lack of proper monitoring to identify progress and directions for improvement of these plans, which should be assessed every four years. The FAO indicates that approximately 136 shark-fishing states voluntarily develop a plan. Of the 136 states, 26 account for more than 1% of the global shark catch. Of these 26 states, 88% are said to have adopted or drafted a NPOA, including Canada, while the remaining 12% are described as ‘of concern’, which indicates that the country has taken no action, nor has communicated intent to develop a plan (Shark working group at the CITES animals committee meeting; 2012, Switzerland, pers. comm.). Only two of the twenty-six countries, Japan and Australia, have reviewed and revised their plans since they were implemented [10–12]. In light of limited adoption, review, and revision of NPOAs, the goal of this research was to

evaluate Canada’s 2007 NPOA against its own stated objectives and actions, against the recommended process and content provided by the IPOA and against Australia’s NPOA. It was found that the development and content of Canada’s NPOA was predominately focused on Atlantic Canada and the eastern Arctic region, and as such this region forms the focal point of this research; however, the Pacific region is also discussed where appropriate.

## 2. National Plans of Actions for Sharks

The purpose of the IPOA-sharks is to facilitate the identification of data gaps through its comprehensive framework and shark assessment report (SAR) at the national level. The framework is circumscribed by an overarching goal, a set of principles, and procedures for implementation with a set of ten objectives, which all states are encouraged to adopt in their NPOAs (see Table 1) [8]. Table 1 summarizes the IPOA recommendations on process and the minimum objectives needed for developing content in a plan of action, and can be used as a checklist in following a standardized method to protect and manage sharks.

The purpose of conducting a SAR is to ensure a comprehensive report, which aims to quantify elasmobranch stock status, fishing effort for directed and non-directed fisheries, outline existing management and mitigation measures, identify threats, and suggest possible modifications to these management measures. Within the nature and scope of the IPOA, it explicitly describes the term “shark” as including all chondrichthyan fishes [8]. Equally inclusive, the IPOA defines shark “catch” as directed, bycatch, commercial, recreational, or other forms of taking sharks and incorporates both target and non-target species. In addition, the FAO recommends that states engage stakeholders in the development of the plan, review the plan at least every four years, and report their progress to the FAO [8]. In theory, all NPOAs should work towards incorporating FAO guidelines on process and content (Table 1). However, most NPOAs, including Canada’s, fall short in adopting these recommendations, and neglect, for example, addressing all chondrichthyans, developing

**Table 1**  
Summary of recommendations on International Plan of Action (IPOA) process and content. National Plans of Action (NPOA) of Canada and Australia are compared.

| IPOA-process   | Countries adherence |           | Minimum content-IPOA objectives   | Addressed in NPOA |           |
|--|---------------------|-----------|---|-------------------|-----------|
|  | Canada              | Australia |   | Canada            | Australia |
| 1. Engage stakeholders in the development, implementation, and review of the plan    | No                  | Yes       | 1. Ensure shark catches from directed and non-directed fisheries are sustainable  | In-part           | Yes       |
| 2. Conduct a Shark assessment report (SAR)   | No                  | Yes       | 2. Assess threats to shark populations, determine and protect critical habitats and implement harvesting strategies consistent with principles of biological sustainability and rational long-term economic use | In-part           | Yes       |
| 3. Identify and address all ten IPOA objectives                                      | No                  | Yes       | 3. Identify and provide special attention, in particular to vulnerable or threatened shark stocks   | Yes               | Yes       |
| 4. Prioritize shark conservation and management issues arising from the SAR          | No                  | Yes       | 4. Improve and develop frameworks for establishing and coordinating effective consultation involving all stakeholders in research, management, and educational initiatives within and between States            | No                | In-part   |
| 5. Create actions, targets, and timelines to respond to issues identified in the SAR | No                  | Yes       | 5. Minimize unutilized incidental catches of sharks   | No                | Yes       |
| 6. Identify responsible agencies for implementation                                  | No                  | Yes       | 6. Contribute to the protection of biodiversity and ecosystem structure and function  | In-part           | Yes       |
| 7. Develop performance indicators to assess and monitor the plan for effectiveness   | No                  | Yes       | 7. Minimize waste and discards from shark catches   | No                | Yes       |
| 8. Identify and build capacity to implement actions                                  | No                  | Yes       | 8. Encourage full use of dead sharks  | No                | In-part   |
| 9. Review and revise the plan at least every four years                              | No                  | Yes       | 9. Facilitate improved species-specific catch and landings data and monitoring of shark catches   | Yes               | Yes       |
| 10. Develop regional plans that complement the national plan                         | No                  | No        | 10. Facilitate the identification and reporting of species-specific biological and trade data   | In-part           | Yes       |
| 11. Report progress of plan to FAO   | No                  | Unknown   | –   | –                 | –         |

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