

## APPENDIX I

### CANADIAN LEGISLATION

Canada's approach to addressing bycatch is complex, with international influence on its national and regional oversight. With this complexity comes a multitude of opportunities for bycatch management that attempt to address the scale, scope and status of bycatch in Canadian fisheries. Legislation and policies provide broad – and in some circumstances, prescriptive – direction, which can be implemented through national and regional fisheries strategies and mechanisms.

#### Do Canada's policies reduce bycatch?

##### **Summary**

A number of policies exist to address bycatch; however their associated procedures and mechanisms are not consistent. The *Policy on Managing Bycatch* is meant to provide national guidance; however it allows diverse approaches to be adapted across fisheries. Furthermore, given the limited applicability of each policy, there are species that may not fall under any of them, and therefore efforts to address bycatch can be overlooked. Similar to broader fisheries management (DFO, 2012), developments with respect to bycatch are made in a patchwork manner that can be influenced by the specific conflicts that arise within fisheries. The result is a web of policies and management practices that are customized to each fishery. Without a clear national policy, ad hoc decisions can be made that may not portray precautionary and ecosystems approaches. Issues of gaps in and between the policies may result in bycatch management being unsupported or not implemented.

The protection, conservation and management of Canadian fisheries is supported under several different policies that influence bycatch management. Not all of the policies explored in this report are directly derived from Canada's current laws, however, the policies in effect are established to guide fisheries management and the mechanisms put in place to address bycatch.

##### **Sustainable Fisheries Framework**

The Sustainable Fisheries Framework (SFF) was developed in 2009 to support the conservation and sustainable use of Canada's commercial fisheries. This overarching framework seeks to apply ecosystem-based and precautionary approaches to fisheries management. The SFF is comprised of policies and tools designed to help ensure that Canada's fisheries are environmentally sustainable while supporting economic prosperity (DFO, 2009).

##### **Policy on Managing Bycatch**

The *Policy on Managing Bycatch* is a key component of the SFF and is designed to meet Canada's international commitments to address bycatch. The policy's foundations stem from the Food and Agricultural Organization of the United Nations (FAO) 1995 *Code of Conduct for Responsible Fisheries* and 2011 *Guidelines for Bycatch Management and Reduction of Discards*.

The strength of the *Policy on Managing Bycatch* is that it provides a general framework for developing measures to manage bycatch by providing guidance to existing strategies and procedures, as well as new ones through the fisheries planning process (DFO, 2012). It recognizes that bycatch and discard problems are fishery-related and allows for adaptations to be made to meet fishery-specific problems (DFO, 2012b).

The policy applies to both retained and non-retained bycatch<sup>1</sup>, including: species within commercial, recreational, and Aboriginal fisheries managed under the *Fisheries Act*; fisheries licenced and/or managed by DFO operating outside Canada's exclusive economic zone (EEZ); and all non-retained

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<sup>1</sup> This includes all species or specimens retained that the harvester was not licenced to fish for but is required or permitted to keep, and all discarded catch, including released from gear and entanglements, alive, injured or dead, and whether target species or non-target species (DFO, 2012).

catch, including birds, marine mammals and sea turtles that become entangled in fishing gear (DFO, 2013). It does not apply to catch that harvesters are licenced to fish and that are retained.

Under the policy, the objectives are to ensure Canadian fisheries management supports sustainable harvesting, minimizes the risk of fisheries causing serious or irreversible harm to bycatch species, and accounts for total catch, including retained and non-retained bycatch (DFO, 2013). Strategies within the policy's Guidelines (2013) for achieving these objectives include:

- Develop data collection and monitoring systems that will support timely, reliable and aggregated reporting on retained and non-retained bycatch species;
- Evaluate the impact of fishing on bycatch species, whether they are retained or returned to the water;
- Minimize the capture of bycatch species and specimens that will not be retained, to the extent practicable;
- Manage the catch of retained bycatch so as not to exceed established harvest levels for the species;
- Where the capture of bycatch species and specimens that will not be retained is unavoidable, maximize the potential for live release and post-release survival;
- Develop appropriate measures to manage bycatch and regularly evaluate their effectiveness

These strategies are to be implemented on a fishery-by-fishery basis. It is expected that within fisheries, priorities and actions for species caught as bycatch will be developed, incorporating existing management plans. Adopting the *FAO Bycatch Guidelines*, the *Policy on Managing Bycatch* calls for measures that are:

- Binding and enforceable;
- Clear and direct;
- Measurable;
- Science-based;
- Ecosystem-based;
- Ecologically, socially, and economically effective;
- Practical and safe;
- Collaboratively developed with fishing participants and others with an interest; and
- Fully implemented.

The *Policy on Managing Bycatch* is to be implemented by incorporating bycatch information into existing Integrated Fisheries Management Plans (IFMPs). Information on the nature and occurrence of bycatch, and cross-referenced information from other management or rebuilding plans for a bycatch species is to be included in IFMPs. The imperative of this initial step is that sufficient data is required. It has already been noted that many IFMPs do not reference the *Policy on Managing Bycatch*, indicating they are likely outdated (McDevitt-Irwin et al. 2015).

### **Weaknesses with the *Policy on Managing Bycatch***

Unfortunately, the *Policy on Managing Bycatch* has limited application, as it only relates to commercial, recreational and Aboriginal fisheries and does not apply to targeted catch, or to incidental fishing mortality that results from pre-catch losses or ghost-fishing (DFO, 2013).

As a national policy implemented on a fishery-by-fishery basis, the *Policy on Managing Bycatch* does not allow for national standards. Rather, it perpetuates ongoing differences between regional fisheries management processes and across fisheries. In developing the *Policy on Managing Bycatch*, DFO's Guidance report (DFO, 2012b) stated that benchmarks for sustainability need to be included to evaluate bycatch relative to the policy. However, the policy does not include this evaluative process.

The *Policy on Managing Bycatch* relies on other measures for implementation; however it is ineffective in addressing bycatch in cases where IFMPs have not been effectively developed. In addition, fisheries monitoring is expected to be the foundation of the *Policy on Managing Bycatch* and other fishery

management and policy decisions; however the *Catch Monitoring Policy* (outlined below) is still under development. Although the *Policy on Managing Bycatch* outlines the need to develop data collection and monitoring systems, to date this undertaking has not been completed.

#### ***Fishery Decision-Making Framework Incorporating the Precautionary Approach***

The *Fishery Decision-Making Framework Incorporating the Precautionary Approach (PA Framework)* *Policy* outlines how the precautionary approach should be implemented in the absence of full data certainty in developing a harvest strategy. A key component of this policy is the need to develop rebuilding plans where a stock has reached the defined Critical Zone (DFO, 2013c) to ensure that removals from all fishing sources are kept to the lowest possible level until the stock has grown into the Cautious Zone. Under the *PA Framework*, where an IFMP exists, a rebuilding plan is considered an extension of the IFMP (DFO, 2013c). Where an IFMP does not exist, a rebuilding plan may be developed as a stand-alone document.

In defining rebuilding objectives of mixed-stock and multispecies fisheries, management actions to rebuild a depleted stock *may* require restrictions on fishing opportunities for other stocks and species whose populations are healthy (DFO, 2013c). The *Framework* explicitly states there should be no tolerance for preventable decline whether the stock is declining, stable or increasing (DFO, 2013c). However, socioeconomic impacts and requirements are to be considered to balance with conservation objectives. As a result, there is the potential that this will allow for depleted species caught as bycatch to be overlooked for socioeconomic reasons and will hinder the ability to keep fishing removal sources to the lowest possible level.

#### ***Sensitive Benthic Areas Policy***

The *Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas (SBA Policy)* was developed to ensure healthy and productive marine benthic ecosystems (DFO, 2009b). The Policy applies to all commercial, recreational and Aboriginal marine fishing activities licences under the *Fisheries Act* and the *Coastal Fisheries Protection Act*, or managed by DFO outside the EEZ.

The *SBA Policy* outlines guiding principles, including an ecosystem-based approach, conservation, a precautionary approach, using the best available science and integrated management (DFO, 2009b). Under the policy, mapping and data collection will be used within an Ecological Risk Analysis Framework to assess the risk of an activity to likely cause harm to the benthic habitat, communities and species, and whether harm is likely to be serious or irreversible (DFO, 2009b). Areas identified as moderate to high risk, based on consequence and likelihood of impact, may or must include management measures that mitigate this risk.

The policy gives particular consideration to fishing impacts on corals and sponges (DFO, 2013e). Other marine plants and other benthic organisms are not covered – a point raised in the National Peer review meeting on guidance related to the *Bycatch Policy* (DFO, 2013d). The discussion noted that sea cucumbers, would not be covered under the *Sensitive Benthic Areas Policy* with its current scope. This is a noted gap in the SFF in protecting marine plants and other benthic organisms.

#### ***Catch Monitoring Policy***

As a means of improving fisheries management in Canada, DFO is working on a risk-based national catch monitoring policy under the SFF. This framework is expected to include policy standards, criteria and tools to guide decisions regarding catch reporting and monitoring in individual or categories of fisheries (DFO, 2013f). An anticipated completion date has not been provided. DFO's Reports on Plans and Priorities for 2015-2016 and 2016-2017 do not outline this policy as a priority; however advancing work on implementing the Sustainable Fisheries Framework is noted. As a result, Canada does not have a national policy or standard for monitoring catch.

#### ***SARA Listing Policy and Directive for “Do Not List” Advice***

The *SARA Listing Policy and Directive for “Do Not List” Advice* provides guidance to operationalize and support the implementation of the Species At Risk Act (SARA) (Appendix II) with respect to marine species (DFO, 2014). Following a COSEWIC assessment that a species should be listed, DFO is to list a

species under SARA, unless a rationale for not doing so is put forward. In line with the precautionary approach in SARA's preamble, the “do not list” advice must be compelling and based on a rigorous, structured, comprehensive and transparent analysis. Where species are not listed based on compelling reasons, a work plan must be developed. In a recent study, it was found that only 12 of the 62 fishes assessed as being at risk by COSEWIC have been listed under SARA (McDevitt-Irwin et al., 2015). The remainder have either been denied or are still under consideration.

In 2016, the Minister of Fisheries, Oceans and the Canadian Coast Guard announced that 12 aquatic species were being proposed for listing under SARA (DFO, 2016). Of the species to be listed, loggerhead sea turtles, leatherback turtles, and beluga whales (St. Lawrence Estuary population) are threatened by entanglement in fishing gear.

### **Other Policies**

Regional policies have been developed for the Pacific and Atlantic regions. On the Pacific Coast, DFO's *Policy for Selective Fishing in Canada's Pacific Fisheries* aims to ensure selective fishing technology and practices are adopted where appropriate (DFO, 2001). The policy put forward calls for a shift in practices for licenced harvesters. It places conservation of Pacific fisheries as the primary objective, using a precautionary and ecosystems approach. Furthermore, all recreational and commercial fisheries are expected to develop selective fishing practices that address bycatch. The policy states that where standards are not met and bycatch impedes achievement of conservation goals, fishing opportunities will be curtailed (DFO, 2001). This type of policy obligates harvesters and anglers to put in place adequate fishing measures instead of on government to develop solutions.

In addition, the Pacific Coast's *Strategic Framework for Fishery Monitoring and Catch Reporting in the Pacific Fisheries* aims to improve monitoring and reporting within fisheries (DFO, 2012c). It is expected that these requirements will support other SFF components through conducting a risk assessment of each fishery and determining the monitoring and reporting requirements necessary within each fishery. The risk assessment tool is built on the Fishery Checklist used for IFMP planning and the Ecological Risk Analysis Framework (DFO, 2012c). The policy calls for fisher-dependent techniques for monitoring and reporting their catch, as well as monitoring and reporting by regulatory authorities. Information requirements are expected to include bycatch of non-target fish, seabirds, sea turtles and marine mammals, regulated releases and discards of target and non-target species, encounters with species not-captures and impacts of fishing operation on habitat (DFO, 2012c).

### Pacific Coast Monitoring and Catch Reporting - Key Points

The policy calls for consistency for in determining information requirements and monitoring programs within Pacific Coast fisheries. The policy aims to address deficiencies in information gathering, in terms of coverage of the fisheries, missing or unreliable data (particularly on bycatch and discards), reporting delays and other issues.

The new approach put forward incorporates the 2002 Pacific Region Fishery Monitoring and Reporting Framework through application by applying of a risk assessment to each fishery to determine monitoring and reporting requirements that reflect each fishery's unique characteristics.

The initial assessment of fishery-specific requirements will be completed by DFO, but the development and implementation of monitoring and reporting plans are to be completed with harvesters and other stakeholders.

#### Gaps

- The policy brings consistency within fisheries but not across them and therefore does not allow for cross-fishery comparisons
- Timelines for completion of fishery-specific information requirements are not provided
- There is no enforcement of implementation to ensure the policy is being implemented
- There is limited monitoring guidance to ensure fishery harvesters within fisheries are following the monitoring and reporting plan

A *Policy Framework for the Management of Fisheries on Canada's Atlantic Coast* was put forward in 2004 following a policy review launched in 1999 (DFO, 2004). The policy provides direction that allows for the conservation and sustainable use of resources, with an emphasis on shared stewardship. It acknowledges bycatch impacts from fishing gear that should be taken into account through ecosystem management to protect the health of stocks (DFO, 2004).

### Mechanisms and Decision-Making Processes

The many mechanisms available are used to implement policy objectives but can also be used as a tool in decision-making to influence how bycatch should be addressed. The mechanisms allow for discretion in implementation, based on the needs of a fishery but do require adequate data to ensure measures are effective. Whether greater detail is necessary to effectively manage bycatch can be dependent on the assessment methodology and the management system itself (Babcock, Pikitch & Hudson, 2002).

Therefore, it is important to consider the level of knowledge and information required in order for mechanisms to be effective. The mechanisms outlined do little to address fishers' behaviour or include the use of incentives to avoid bycatch. Cooperation and commitment by fishers to minimize bycatch to the extent possible, coupled with effective monitoring, control, and surveillance can bring change at the community level. This is particularly important where policies are not being implemented to the extent necessary and where mechanisms are not enforceable and have the discretion to be changed by government.

In addition to the legislation and policies available, binding and non-binding measures related to bycatch have been implemented by DFO. Mechanisms are a mix of science and other advice, management and decision-making processes that are used to address bycatch

### Integrated Fisheries Management Plans

Integrated Fisheries Management Plans (IFMPs) are the primary resource management tool applying the Sustainable Fisheries Framework (SFF) and managing commercial fisheries (DFO, 2014b). IFMPs aim to identify goals and measures relating to conservation, management and science for a particular fishery. They provide a planning framework by which a fishery should be managed (DFO, 2013c). IFMPs provide a clear and concise summary of the characteristics of a fishery, scientific aspects, management

objectives, management measures used to achieve those objectives and the criteria against which objectives will be measured (DFO, 2013c).

IFMPs are expected to include all available data, including information and management plans related to fishery-associated species that are bycatch, and in particular where they are listed under SARA (DFO, 2013g). IFMPs should identify species listed under SARA that are incidentally impacted by a fishery, how the expected recovery of a listed species is impacted by the fishery, all mitigation measures to minimize impacts where exemptions under section 83(4) of SARA applies, and where licenses under section 74 allow harm to SARA-listed species a mandatory statement must be included (DFO, 2013g). Where bycatch has been identified as an issue in a fishery, IFMPs should include management measures that follow the *Bycatch Policy*. As outlined in the guide to preparing IFMPs, “because a species might be the target of one fishery and be intercepted as bycatch in others, there may be a need for IFMPs to reference one another, to acknowledge cumulative fishing mortality and ensure management measures are complimentary and comprehensive” (DFO, 2013g).

The *Bycatch Policy* does not outline processes for ensuring these measures are incorporated into plans and whether they are being implemented. In addition, inclusion of measures within IFMPs does not guarantee they will be implemented, enforced or assessed for effectiveness (McDevitt-Irwin et al. 2015). Furthermore, IFMPs are discretionary and are not mandatory for fisheries, which could limit their effectiveness in addressing bycatch.

### **Conservation and Harvesting Plans**

Conservation and harvesting plans outline length restrictions, possession limits and gear restrictions. The elements of a harvesting plan outline do not specify bycatch; however the measures listed influence the rate of bycatch within a fishery. Currently, there is only the 2006 Report outlining how strategies should take a precautionary approach, but no national plan for implementing conservation and harvesting plans have been developed.

Conservation and harvesting plans should take a precautionary approach in outlining a harvest strategy for a fishery (DFO, 2006). These plans should include removal references delineated by a limit reference point and an upper stock reference point within each of the three stock status zones. These plans are expected to include any nature of harvesting, including commercial, recreational, subsistence, etc., and the removal rate pertains to all human-induced mortality, including for example, bycatch, discards, incidental mortality or deaths caused by other human activities.

### **Sustainability Survey for Fisheries**

The Sustainable Survey for Fisheries is used to assess annual performance progress towards implementing the SFF through IFMPs. Information is used to monitor improvements in the management of a fishery and can encompass information on target stocks, non-target species bycatch, habitat and ecosystem effects, and management (DFO, 2014b).

The survey results show that the Policy on Managing *Bycatch Policy* has not been fully implemented. From a review of the data, 122 of the 159 stocks had associated bycatch, and of the 122 identified, the risks of bycatch was assessed or partially assessed in 97 (80 per cent) of stocks. Management measures are in place in 73 per cent of stocks in which bycatch was identified (DFO, 2016b).

As an annual survey tool, the *Sustainability Survey for Fisheries* is useful for outlining the extent to which DFO is implementing SFF policies. However, the survey questions are high level and do not provide details of the extent to which each SFF policy has been implemented. Without an explanation for what falls under “partially assessed” and “assessed,” there is no indication of whether the management measures that have been implemented will be effective.

### **Advisory Committees**

Advisory committees are involved in formal consultations to discuss fishery reviews, plans and annual Total Allowable Catches (TACs), and provide management and development, particularly under IFMPs. Committees are meant to serve as a consultative body for fishers and therefore adequately represent the

interest of fishers (DFO, 2014b) and can influence policy and management decisions by DFO such as the implementation of bycatch measures within a specific fishery. There are several advisory boards across Canada, including the National Seabird Bycatch Working Group, Atlantic Large Pelagics Advisory Committee and Scotia-Fundy Large Pelagics Advisory Committee.

### Catch Monitoring and Reporting

Currently, there is no national policy or framework standardizing catch monitoring and reporting in Canada. The monitoring and reporting mechanisms used, and the rigor with which they are implemented, varies by Canadian fishery. Dockside, at-sea observers, fisher reporting and technological monitoring vary. To provide adequate data on bycatch, monitoring should include the number of fish caught and discarded (directed or bycatch), location and timing, biological characteristics and fishing method (DFO, 2016c).

A recent Auditor General review of Canada's fisheries found that DFO does not have adequate means of ensuring that observers provide timely and reliable information (OAG, 2016). DFO has the regulatory authority to designate companies to monitor fishing activities and the amount of fish caught, but due to changes to the at-sea observer program in 2013, it no longer has contractual relationships with them. The fishing industry now contracts with these companies directly, which means if a company fails to comply with program requirements, DFO cannot take formal measures other than to revoke the company's designation for monitoring fishing practices across all regions (OAG, 2016). However, this would disrupt access to catch data, leaving little recourse.

The Auditor General review also found that DFO is unable to mitigate potential issues of conflict of interest for dockside monitoring companies; that certain regions did not have specific timeframes for providing data or officials did not have timely access to third-party data on bycatch and discarded fish; and that DFO does not require a clear rationale for determining the target coverage for at-sea observers needed to provide information for managing fish stocks (OAG, 2016).

As of 2013, DFO has reduced oversight of the At-Sea Observer program by providing industry with the responsibility to cover the costs of the program and to enter directly into contract with at-sea observer service providers. DFO's role is to monitor and audit the program as well as set standards for observer certification (DFO, 2013f).

Although at-sea and dockside monitoring and reporting programs have been established across the Gulf of St. Lawrence, Atlantic Canada, Quebec and in British Columbia (DFO, 2007), the ability to record all bycatch, both retained and discarded, is difficult. Dockside monitoring does not always record species discarded at sea, whereas at-sea observer monitoring often provides inadequate sampling to achieve meaningful estimates of bycatch levels (DFO, 2007). Fishers that report on bycatch using identification guides may not report accurately (DFO, 2007) and there is the potential for incentivized misreporting (DFO, 2013d).

On Canada's west coast, all commercial groundfish hook and line and trap vessels have had full accounting of all fish through 100 per cent at-sea video monitoring under the Groundfish Program since 2006 (DFO, 2012). In addition, several commercial invertebrate fisheries (Geoduck, Sea Urchins, Sea Cucumber and Euphausiid) operate under 100 per cent dockside monitoring. Other measures in place range from 25 to 100 percent coverage (DFO, 2012). Despite these efforts, there are deficiencies in missing and unreliable data related to bycatch and discards, coverage of a fishery, and reporting issues (DFO, 2012).

In Atlantic Canada, reporting on bycatch comes primarily from at-sea observers but varies annually by fishery, gear type and location (EAC, 2016). Examples of this variation are approximately two per cent coverage for 4X groundfish, five-10 per cent coverage for pelagic longline and 60 per cent coverage for the 5Z groundfish mobile gear sector (EAC, 2016). Dockside monitoring is also used, either with self-reporting or by a third-party, with different system requirements for data reporting and monitoring by fishery (EAC, 2016). Video monitoring in Atlantic Canada has been proposed in addition to the current monitoring measures (EAC, 2016).

Given the varying levels of monitoring and reporting across fisheries, assessment of the level of bycatch continues to be based on inference with a potential for error. Catch monitoring and reporting is essential for implementing the SFF and in particular the *Bycatch Policy* (DFO, 2013b). In order for the *Bycatch Policy* to be fully implemented, a systematic examination of bycatch in all Canadian fisheries is needed (DFO, 2012b). This will require reporting of bycatch to determine the composition and magnitude of bycatch in all fisheries and will likely require increasing the current percentages of monitoring and reporting across fisheries.

Complete observation and mandatory landing of all bycatch has been put forward as a potential solution but the downfalls associated with mandatory landings, such as the requirement to maintain individuals that would have likely survived as discards and also the economic cost to the industry, must be considered (DFO, 2013d).

### **Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Assessments**

COSEWIC is an independent body of scientific experts from across Canada that assesses whether species are at risk. COSEWIC's role in bycatch management is to identify species at risk in Canada while highlighting the threat of bycatch as a reason for designation. COSEWIC assessments are meant to be based on the best available scientific information, and are independent of the government's decision to list species under SARA. However, these assessments are used as recommendations for the decision by the Minister of Fisheries, Oceans and the Canadian Coast Guard for listing species.

### **Species at Risk Act**

DFO is legally required to protect a species that has been listed under SARA. The Act's provisions call for mechanisms that DFO is legally required to implement. Bycatch species listed as threatened or endangered require a recovery strategy (s.37) and action plan (s.47) to be developed. Within a recovery strategy, where recovery is feasible, the strategy must address the threats identified and any existing plans for recovery. Where recovery is not feasible, the recovery strategy must include a description of the species and its needs, an identification of the species' critical habitat to the extent possible, and the reasons why its recovery is not feasible (s.41(2)).

An action plan should further the recovery strategy by outlining actions to ensure recovery of a species. These plans should include methods for measuring recovery and the socioeconomic costs of the plan and the benefits derived from implementation (s.49(1)). Recovery strategies and action plans, should, to the extent possible, define critical habitat of a species. Defined critical habitat cannot be destroyed under the Act (s.49(1)(c)). For species listed as special concern, management plans must be developed (s.65). Critical habitat for species of special concern does not need to be designated.

The strategies and plans developed for species listed under SARA should be outlined within rebuilding plans and IFMPs (DFO, 2013c; DFO, 2013g). In addition, SARA strategies and plans should incorporate other plans and measures in place for a species. This would hopefully ensure management gaps are minimized. However, there are noted delays in SARA listings and in the development of recovery strategy, action plans or management plans (McDevitt-Irwin et al. 2015).

### **Sustainable seafood certifications**

Eco-certification of seafood is used to identify fisheries and product value chains with sustainable practices. FAO has provided guidance on voluntary seafood certification as a market measure to promote sustainable fisheries management and trade (FAO, 2009, FAO, 2011). FAO notes that some seafood labels are state-based and not process-oriented, which includes environmental aspects such as bycatch and discards (FAO, 2016). In Canada, Marine Stewardship Council (MSC) is the leading certification system, but other recommendation-based systems, such as SeaChoice and Ocean Wise, have also been established.

Criteria choices are made by each certification label which can result in contradictory labels, where environmental impacts are acceptable for one label but not another. The bycatch of non-target species may disqualify a product from receiving certification under one label but not another. In 2012, Monterey

Bay Aquarium's Seafood Watch Program began benchmarking different programs to equate criteria. In reviewing MSC certification, Seafood Watch found that MSC standards were not equivalent, meaning that MSC's fisheries assessment methodology was benchmarked to a Seafood Watch recommendation score of "good alternative" (2.38) (MBA, 2013). This was based primarily on the low score received under MSC's principle 2, minimizing environmental impact. Seafood Watch noted that MSC's standards preclude bycatch of endangered or threatened species (MBA, 2013). Specifically, it was noted that MSC considers only the "marginal impact" of the fishery under assessment whereas Seafood Watch considers the cumulative impact of all fisheries impacting a species of concern (MBA, 2013).

There is little evidence that shows MSC certification leads to improved conservation for Canadian species at risk (McDevitt et al. 2015). In order to be effective, certification schemes should ensure certified fisheries are not endangering species at risk. For this to work, MSC would have to consider all Canadian at-risk marine fishes, regardless of whether they have been SARA listed (McDevitt et al. 2015).

In 2015 MSC modified their Fisheries Certification Requirements, stating that the previous indicators did not provide incentives for fisheries to minimize mortality of unwanted catch to the extent possible (Table 3) (MSC, 2014). The new requirements remove the term "bycatch," and incorporate "secondary species," introduce a biologically based limit for comparative purposes, and removed the qualification "does not pose a risk of serious or irreversible harm to endangered, threatened, or protected (ETP) species." MSC considers these new requirements to be in line with the FAO Ecolabelling Guidelines; however they may reduce the responsibility of certified fisheries to address bycatch and the impact on ETP species.

Certification schemes are part of a "market based" approach to introduce changes in fisheries management practices regulated by the market that are sustainable (FAO, 2016). As there is no body regulating the standards of certification schemes, they should adhere to FAO guidelines on eco-labelling.

### **Fisheries Regulations**

As noted above, fisheries regulations in Canada are used to create compulsory requirements for fisheries, including licence requirements, vessel and gear requirements, closures and fish size restrictions. These tools can be implemented to minimize and control bycatch. Therefore, regulations could be used to implement binding measures that seek to address bycatch by requiring fishers to adopt these measures within their fishing practices.

### **Others as appropriate**

In addition to the above, regional and national plans provide another tool with which bycatch can be managed. These plans are based on the precautionary and ecosystems approaches in addressing the conservation and sustainability of species. Examples include:

- *National Action Plan for the Incidental Catch of Seabirds in Longline Fisheries;*
- *Atlantic Canadian Loggerhead Turtle Conservation Action Plan; and*
- *Canada's National Plan of Action for the Conservation and Management of Sharks.*

National action plans aim to develop a consistent approach to management which incorporates reductions of bycatch and discard mortality (e.g. DFO, 2007). However, it is unclear whether measures within plans of action are being implemented.

For example, the *National Plan of Action on the Conservation and Management of Sharks* specifically includes the following measures related to bycatch (DFO, 2007):

- Improved reporting of discarded bycatch and the associated mortality rates in domestic fisheries through better data collection and species identification by at-sea fisheries observers, as well as through mandatory reporting of all bycatch for the commercial and recreational fishing industry;
- Continued awareness-raising efforts about the risks facing shark and shark-like species and promoting conservation-based release practices to reduce discard mortality;
- Encouraging the strengthening of regulations of relevant RFMOs with regard to both the handling and release of shark bycatch species and to improve identifying and reporting bycatch and associated mortality; and
- Reviewing the current practices in all commercial and recreational fisheries and implement,

where feasible, new rules or technologies with the potential to reduce both the bycatch of sharks and associated mortality.

The 2012 Progress Report states that “more stringent conservation and management measures for sharks have been implemented in Canada” (DFO, 2012d), however it is unclear what this statement refers to.

Other procedures and protocols developed also provide avenues through which to address the issue of bycatch. The *Procedures for Monitoring and Control of Small Fish Catches and Incidental Catches in Atlantic Groundfish Fisheries* addresses incidental catch in Atlantic Canada through the use of operational procedures such as closures, monitoring, sampling and communication protocols (DFO, 2008). It is unclear how these protocols are connected to other management measures that seek to address bycatch.

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