A Standardized Benchmarking Framework for RFMO Performance

Annika Nordin Saltman

A thesis

submitted in partial fulfillment of the

requirements for the degree of

Master of Marine Affairs

University of Washington

2015

Committee:

Terrie Klinger

David Fluharty

Program Authorized to Offer Degree:

School of Marine and Environmental Affairs

University of Washington

Abstract

A Standardized Benchmarking Framework for RFMO Performance

Annika Nordin Saltman

Chair of the Supervisory Committee:
Professor Terrie Klinger
School of Marine and Environmental Affairs

Regional fisheries management organizations (RFMOs) are intergovernmental regional fishery bodies or arrangements with authority to establish binding conservation and management measures for straddling fish stocks and fisheries on the high seas. The published literature has focused on the need for RFMOs to improve and strengthen their governance structures to promote successful management outcomes. Performance assessment has been identified as a means of achieving this objective. While some RFMOs have engaged in performance assessment, variation in the stated purpose of each assessment and in the evaluation frameworks used has led some to call for the development of a standard benchmarking framework that can be applied across all RFMOs. Notably, the utility of such a framework has been generally accepted without analysis of the potential obstacles to its creation. I explore the argument for the creation of such a standardized benchmarking framework. I find that despite expressed need for such a framework, organizational diversity across RFMOs creates barriers to development and implementation of standardized evaluations, suggesting the need for flexibility and diversity among frameworks. I conclude that obstacles to the creation of a single standard, comprehensive evaluation framework exist, and that the use of evaluation criteria appropriate for individual RFMOs may be more useful.

Acknowledgments

To my family – Papa, Tiny, Julian and Jeff – without whom this thesis may or may not have been possible. And to my advisors – Terrie Klinger and David Fluharty – thank you for all your guidance and patience throughout this process.

Acronyms and Abbreviations vi
1 Introduction 9
1.1 Performance Assessments for Improved Effectiveness 10
1.2 Summary of Existing Performance Reviews and Assessments 12
1.3 Current Evaluation Criteria or Standards for Performance Reviews 16
1.4 The Argument for Developing a Standardized Benchmarking Framework 18
1.5 Exploring the Issues and Barriers to Developing a Standard Benchmarking Framework 22
2 Basic Institutional Structure 24
2.1 Number of Contracting Parties to each Agreement 24
2.2 Differences in Size and Relative Power of Contracting Parties 26
2.3 Decision Making Structure of the Organization 29
3 Scope of the Mandate 33
3.1 Inclusion of the Precautionary Approach and Ecosystem Based Management 33
3.2 Role in Allocation of Managed Resources 34
3.3 Compliance and Enforcement 37
4 Differences in the Spatial Scale and Complexity of Managed Resources 38
4.1 Number of Fish Stocks Managed 39
4.2 Type of Fish Stocks Managed 40
4.3 Geographic Range of Fish Stocks Managed 41
4.4 Measures to Address Bycatch of Sensitive Species Groups 42
4.5 Stocks that are Managed Under the Jurisdiction of More Than One RFMO 43
5 Summary 46
6 Works Cited 48

Acronyms and Abbreviations

ABNJ	Areas Beyond National Jurisdiction Program
ACAP	Agreement on the Conservation of Albatrosses and Petrels
AIDCP	Agreement on the International Dolphin Conservation Program
CBD	Convention on Biological Diversity
CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources
CCBSP	Convention on the Conservation and Management of the Pollock Resources in the Central Bering Sea
CCSBT	Convention on the Conservation of Southern Bluefin Tuna
CEMP	Convention on the Conservation of Antarctic Marine Living Resources Ecosystem Monitoring Program
CMS	Convention on the Conservation of Migratory Species of Wild Animals
COFI	(United Nations) Food and Agriculture Organization's Committee on Fisheries
DFO	Department of Fisheries and Oceans Canada
EBM	Ecosystem-Based Management
EEZ	Exclusive Economic Zone
FAO	(United Nations) Food and Agriculture Organization of the United Nations
GFCM	General Fisheries Commission for the Mediterranean
GLFC	Great Lakes Fishery Commission
HMS	Highly Migratory Species
HSTF	High Seas Task Force
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tuna
ICES	International Council for the Exploration of the Sea
IOTC	Indian Ocean Tuna Commission
IPHC	International Pacific Halibut Commission
IUCN	International Union for Conservation of Nature

IWC	International Whaling Commission
JNRFC	Joint Norwegian-Russian Fisheries Commission
MoU	Memorandum of Understanding
MSC	Marine Stewardship Council
NAFO	Northwest Atlantic Fisheries Organization
NASCO	North Atlantic Salmon Conservation Organization
NEAFC	North East Atlantic Fisheries Commission
NGO	Non-Governmental Organization
NPAFC	North Pacific Anadromous Fish Commission
NPFC	North Pacific Fisheries Commission
NPFMC	North Pacific Fisheries Management Council
PA	Precautionary Approach
PEW	The Pew Charitable Trusts
PFMC	Pacific Fishery Management Council
PRC	People's Republic of China
PSC	Pacific Salmon Commission
PWJMC	Pacific Whiting Joint Management Committee
RFB	Regional Fishery Body
RFMO	Regional Fisheries Management Organization
RFMP	Regional Fisheries Management Plan
SBT	Southern Bluefin Tuna
SEAFO	South East Atlantic Fisheries Organization
SIOFA	Southern Indian Ocean Fisheries Agreement
SPRFMO	South Pacific Regional Fisheries Management Organization
TAC	Total Allowable Catch
UK	United Kingdom
UN	United Nations

UNCLOS	United Nations Convention on the Law of the Sea
UNGA	United Nations General Assembly
UNFSA	United Nations Fish Stocks Agreement (Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks)
WCPFC	Western and Central Pacific Fisheries Commission (Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean)
WWF	World Wide Fund for Nature (World Wildlife Fund in Canada and the US)

1 Introduction

Regional fisheries management organizations (RFMOs) are intergovernmental regional fishery bodies or arrangements with authority to establish binding conservation and management measures (Gilman et al. 2014). A large proportion of global marine fisheries are now managed by one or multiple RFMOs, with almost all of the high seas fisheries covered by at least one RFMO (Cullis-Suzuki and Pauly 2010; Gilman et al. 2014). In fact, a major objective of the Food and Agriculture Organization (FAO) Committee on Fisheries (COFI) is to establish a system of RFMOs that attains global coverage to ensure the proper management of all high-seas stocks (FAO COFI 2007), including those in areas where management gaps now exist. A resolution adopted by the General Assembly of the United Nations urges similar action, encouraging states fishing on the high seas for a straddling or highly migratory fish stock which is not covered by a sub-regional or regional fisheries management organization or arrangement, to cooperate to establish such an organization to ensure the conservation and management of the stock (UNGA A/RES/68/71). Both bodies argue that this will result in better management of interactions between fisheries and the environment, as the conservation and management of all fisheries resources will be encompassed (FAO COFI 2007; UNGA A/RES/68/71).

Much of the published literature pertaining to RFMOs has been, and still is, focused on the need for RFMOs to improve and strengthen their governance structures to ensure successful management outcomes. Concern over the effectiveness of these organizations is based on observations that although conservation is part of the mandate of almost all RFMOs, many have not yet demonstrated success in management or "a genuine commitment" to conservation on the water (Cullis-Suzuki and Pauly 2010). NGOs argue that even though fundamental principles and legal obligations of sustainable fisheries management are contained within fisheries agreements,

there is no uniform application in practice, and RFMOs "need to be made more accountable to the international community and society as a whole" (PEW 2013). In fact, the majority of RFMOs do not seem to have a positive effect on the biomass of the managed stocks (Cullis-Suzuki and Pauly 2010). Published literature has concluded that RFMOs have "generally failed to prevent over-exploitation of the resources they were established to manage, and have neither achieved rebuilding of overexploited stocks nor prevented the degradation of the marine ecosystems in which fishing occurs" (Polacheck 2012).

1.1 Performance Assessments for Improved Effectiveness

One of the proposed ways to improve the effectiveness of RFMOs is to conduct regular performance assessments to identify gaps in governance or institutional structure that could be improved. These can take the form of self-assessments, external reviews or assessments by a combination of internal and external entities. These types of evaluations are widely used by a variety of organizations as a diagnostic tool to obtain useful data on performance, identify important factors that aid or impede achievement of objectives, and to benchmark their performance against other organizations or competitors (Attiany 2014).

Such a systematic approach to the review of RFMO performance was suggested by a ministerially-led Task Force of Illegal, Unreported and Unregulated Fishing on the High Seas (also known as the High Seas Task Force or HSTF; FAO COFI 2007). This task force included representatives of the governments of Australia, Canada, Chile, Namibia, New Zealand, and the UK, as well as the international conservation organizations World Wide Fund for Nature (WWF) and the International Union for Conservation of Nature (IUCN), plus the Earth Institute at Columbia University (HSTF 2006). The task force advocated for strengthened and improved

coordination between RFMOs and proposed that a model of RFMO governance based on an assessment of worldwide best practices in the implementation of international fishery instruments be developed (FAO COFI 2007).

This model of RFMO governance was intended to assist organizations by establishing best practices that could guide future performance assessments by setting a "gold standard". In response to the task force, a model was developed by an independent, five-member panel commissioned by the Governments of Australia, Canada, New Zealand, and the UK, in conjunction with the international conservation organizations IUCN and WWF. The Independent Panel operated from Chatham House (The Royal Institute of Affairs) in the UK, a highly regarded international think tank (Chatham House 2013). The document sets out current best practice in the implementation of international fishery instruments as requested by the HSTF and also "clearly delineates the priorities and goals that RFMOs should pursue if they are to meet the core challenges of global fisheries management" (Lodge et al. 2007). The resulting 2007 publication of the Independent Panel is now one of the most heavily cited documents in RFMO best practice literature and a primary reference for RFMOs undergoing performance assessments.

Other models of best practice for RFMOs all emphasize the importance of adherence to best practices, including the provision for regular performance assessments by each RFMO, and have augmented the evaluation methodology used by RFMOs undergoing performance assessments. These documents include a 2006 report commissioned by WWF International and TRAFFIC International (Willock and Lack 2006), the best practice performance review criteria developed jointly by the tuna RFMOs in 2007 and updated with recommendations in 2009 and 2011 (Kobe I 2007; Kobe II 2009; Kobe III 2011), other documents published by the Independent Panel commissioned by Chatham House (Bjorndal 2007; Mooney-Seus and Rosenberg 2007; Owen

2007; Tarasofsky 2007), and a variety of papers published by the Food and Agriculture Organizations of the United Nations (FAO). Included among the papers published by the FAO is a list of recommendations on the establishment and methodology for performance reviews, which they refer to in their document as "potential best practices" for the process of conducting a performance review (Ceo et al. 2012).

1.2 Summary of Existing Performance Reviews and Assessments

The body of published performance assessments or evaluations of RFMOs includes technical reports, white papers and peer-reviewed literature, with both narrow and broad scope. The focus of these documents may involve one or several RFMOs and tackle one or several management tasks mandated by these specific RFMOs. A typology of performance evaluations shows there are assessments of the collective performance of RFMOs in relation to a specific management task (Category I), assessments of the collective performance of RFMOs overall (II), assessments of the performance of one RFMO in relation to one specific management task (III), and in-depth qualitative assessments of one RFMO, usually initiated by the individual RFMO itself, which cover the overall performance of each management task performed by the organization (IV). I discuss selected examples of assessments that focus on the evaluation criteria and stated purpose used within each document.

(I) Assessments of the collective performance of RFMOs have been made in relation to reducing bycatch of albatrosses and other bird species, the evolution of bycatch governance, current levels of compliance (in a study specifically focused on the collective performance of the five international tuna RMFOs) and of the application of ecosystem-based management (EBM) and the precautionary approach (PA) (Small

2005; Mooney-Seus and Rosenberg 2007; Koehler 2013; Gilman et al. 2014). The albatross report used evaluation criteria based on the principles established by the United Nations Fish Stocks Agreement (UNFSA) to assess fourteen RFMOs whose management areas coincide with the known distributions of albatrosses (Small 2005). The results highlighted the Convention on the Conservation of Antarctic Living Marine Resources (CCAMLR) as the best- performing RFMO in this area (Small 2005). The evaluation of bycatch governance, one element of an ecosystem approach to fisheries management, was assessed for thirteen RFMOs against a suite of five broad criteria. Results revealed large deficits in governance collectively among RFMOs, and also reported mixed progress for individual RFMOs (Gilman et al. 2014). A study of compliance within tuna RFMOs presented a comprehensive baseline survey by identifying best practice and ranking all five RFMOs with regard to their existing compliance monitoring, assessment mechanisms and tools (Koehler 2013). A technical report assessing progress in adopting PA and EBM reviewed 13 RFMOs in relation to identified best practices (Mooney-Seus and Rosenberg 2007), finding that only three RFMOs – the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), the Inter-American Tropical Tuna Commission (IATTC) and the International Pacific Halibut Commission (IPHC), and their respective contracting parties – consistently complied with both scientific advice and corresponding management measures, believed by the authors to be a good indication of how effectively an organization will implement EBM and PA (Mooney-Seus and Rosenberg 2007).

(II) The most recent assessment of the collective performance of RFMOs overall was conducted by the Sea Around us Project at the Fisheries Centre at the University of British Columbia. This study quantitatively assessed the effectiveness of the world's 18 RFMOs using a two-tiered approach, exploring each RFMO's performance on paper and in practice, using the current state of the fish stocks managed by each RFMO, through biomass and fishing mortality reference points and biomass trends through time (Cullis-Suzuki and Pauly 2010). Performance on paper was determined by assessing how well RFMOs scored against a suite of 26 criteria developed by the study's authors. Scoring demonstrated that RFMOs are not reaching best practice standards (Cullis-Suzuki and Pauly 2010). Performance in practice within this study also revealed low performance of RFMOs, with no connection between the two sets of scores, which the authors suggest indicates a disparity between organization intent and action (Cullis-Suzuki and Pauly 2010).

In addition to Cullis-Suzuki and Pauly (2010)'s synthesis, the legal literature has questioned the collective performance of RFMOs overall as it relates to the future of the freedom of fishing on the high seas (*mare liberum*), arguing that freedom of the seas depends on equality among member states of RFMOs and how that equality is secured and operationalized within each organization (Kim 2013). Admission procedures, allocation of fishery participatory rights and decision-making processes of existing RFMOs are not always in accordance with equal access of all states to the high seas (Kim 2013).

(III) The first comprehensive assessment of an RFMO's transparency with regard to compliance included an in-depth assessment of a single RFMO operating in one

region (Gilman and Kingma 2013). The authors used the Western and Central Pacific Fisheries Commission (WCPFC) as a case study to validate a suite of 12 criteria. WCPFC was found to lack transparency in four of the criteria (Gilman and Kingma 2013).

(IV) Many published assessments are focused on the goal of assessing the effectiveness of a single RFMO. For the most part these are formulated as qualitative evaluations of performance. These evaluations have been initiated by the RFMOs themselves in response to the call from the global fisheries community for a more systematic approach to the review of RFMO performance (FAO COFI 2007). These assessments, although not necessarily contributing to a systematic nature of review, do represent the first steps towards a culture of regular reviews. These assessments are performed using a variety of evaluation criteria and specific focuses and are conducted by internal, external or a combination of internal and external reviewers, e.g., the purpose of the review of the North East Atlantic Fisheries Commission (NEAFC) in 2005 was to provide a systematic check on the Commission's performance, its consistency with the NEAFC convention and relevant instruments (NEAFC 2006). A performance review initiated by the Northwest Atlantic Fisheries Organization (NAFO) the same year was performed for the purpose of developing recommendations to modify and/or complete the provisions of the NAFO Convention (which resulted in amendments adopted to the Convention in 2007) and was referred to by the FAO's Committee on Fisheries as "a performance review." NAFO underwent a subsequent review with a similar objective as the NEAFC, which was completed in 2011 (FAO COFI 2007; NAFO 2007; NAFO 2011).

Moreover, there is no established timeline to review the implementation of actions to correct the problems identified by the panels reviewing these organizations. The FAO states that for most RFBs (includes all Regional Fisheries Bodies - both bodies with, RFMO, and without, RFB, the authority to establish binding conservation and management measures) implementation of many of the recommendations given will simply be a "work in progress" for "some time to come" (Ceo et al. 2012). However, several RFMOs have documented their responses to each recommendation given within the performance review in a written, transparent format (CCSBT 2011; NPAFC 2011; CCAMLR 2012; IOTC 2014).

1.3 Current Evaluation Criteria or Standards for Performance Reviews

Probably the closest example to a qualitative standard for use in a performance review by an RFMO that has wide agreement is the set of Performance Review Criteria developed at a Joint Meeting of Tuna RFMOs held in Kobe, Japan, January 2007. These criteria were based on the Common Criteria adopted at the 6th round of states parties to the Agreement for the Implementation of the Provisions of the UN Convention on the Law of the Sea relating to UNFSA. These criteria were also used in performance reviews by both NEAFC in its 2006 and the GFCM in 2011 (NEAFC 2006; GFCM 2011). The Kobe criteria, sometimes referred to as Kobe I or Kobe I criteria, consist of a common set of evaluation criteria agreed upon by the tuna RFMOs to be used to review their performance (Kobe I 2007; Ceo et al. 2012). There have been two subsequent joint meetings of the five tuna RFMOs referred to as Kobe II and Kobe III, as well as a series of workshops (Fisheries and Oceans Canada 2011). The Kobe I criteria stop short of actually calling for "benchmarking" and are instead referred to as "Terms of Reference" for

the review process (CCSBT 2008a; ICCAT 2009). However, it should be noted that the Convention on the Conservation of Southern Bluefin Tuna's (CCSBT) second performance review completed in 2014, refers to the Kobe I criteria as "the core set of benchmarks" used to evaluate the commission, despite the fact that in the original 2008 performance review the Kobe I criteria were also used and there was no reference to the term "benchmark" (CCBST 2008a; Garcia and Koehler 2014). Other non-tuna RFMOs have also based their performance review criteria on these Terms of Reference (CCAMLR 2008). These reviews generally include the following elements: legal analysis of the Agreement, conservation and management, compliance and enforcement, decision-making and dispute settlement, international cooperation and financial and administrative issues (Ceo et al. 2012). Although this could be considered the main qualitative standard based on the number of RFMOs using some form of the Kobe I criteria for performance assessment, and has been deemed to have "generic value for RFMOs in general," other international standards of evaluation have emerged which must also be considered (Garcia and Koehler 2014). This is evidenced by the inclusion in the CCSBT's 2014 Performance Review, which although it based the majority of its evaluation on a qualitative approach from the Kobe I criteria, also included a section at the end called "Other Sources" (Garcia and Koehler 2014). These sources included an assessment against the Chatham House best practices (Lodge et al. 2007), an assessment against the Marine Stewardship Council (MSC) criteria and an additional "more synoptic" representation of the CCSBT's performance against the Kobe I criteria (Garcia and Koehler 2014).

There have been several attempts to develop a way to quantitatively measure RFMO performance since 2007, some of it based on the work of Lodge et al. (2007). The literature shows the development of benchmarks or standards for certain recommended best practices,

attempts at benchmarking for domestic fisheries governance, and attempts to quantify RFMO performance (Alder and Lugten 2002; Grafton et al. 2007; Nevill 2009; Cullis-Suzuki and Pauly 2010; Gilman and Kingma 2013). Although Lodge et al. (2007) claimed to specify internationally agreed-upon best practice for RFMOs, a benchmarking framework that is comprehensive, limits the subjectivity of the evaluator, and is applicable to an international commission has not yet been developed. It has also been suggested as recently as 2013 that "the lack of quantifiable guiding principles on which RFMOs can draw" has partly been to blame for certain RFMOs failing to meet management objectives in respect to allocation (Bailey et al. 2013). The report from the Second meeting of FAO and Non-FAO regional fishery bodies on arrangements in 2001 summarizes the development of universal indicators from the perspective of the RFBs in attendance, reporting "in most cases it was felt that quantitative assessments of performance…could be difficult" and "while supporting in principle the need to develop performance indicators and related guidelines, participants emphasized that, in view of the various nature of regional fishery bodies, it was difficult to establish indicators which were generally applicable to all RFBs" (FAO 2001).

1.4 The Argument for Developing a Standardized Benchmarking Framework

Analysis shows that there have been efforts to review the performance of these organizations since 2005, with increasing participation from RFMOs following the suggestion of the HSTF in 2006 and the publication of a model of RFMO performance in 2007. Many of these reviews use either the UNFSA requirements that may be considered "*minimum requirements*" or the Kobe I criteria developed by the tuna RFMOs in 2007 (reflective of the UNFSA requirements and

updated with recommendations in key areas through the Kobe II, Kobe III and related working groups process) as evaluation criteria. However, there is still considerable variation in practice with respect to whether or not and how these evaluations are performed, whether there exist provisions for *regular* performance assessment by each RFMO, and whether or not there exists the institutional will to address the recommendations that emerge from such assessments. Although all of these issues still need to be addressed by the community of regional fisheries bodies as a whole, here I explore the approach and criteria used to evaluate individual RFMOs, as these provide the basis on which RFMOs as individual organizations, and as a group, are able to assess, evaluate, and modify their performance to achieve successful management.

The UNGA on 9 December 2013 calls upon states "to strengthen the comprehensiveness of…reviews over time, as necessary" and the necessity of developing "common criteria" for the evaluation of core functions and obligations of RFMOs has been emphasized throughout many documents (Willock and Lack 2006; Ceo et al. 2012; UNGA A/RES/68/71). I explore the argument for the creation of a standardized benchmarking framework. This framework would encompass both the pertinent international processes and the peer review literature by scholars and independent groups of experts. It is argued that such a framework could serve to assist RFMOs in periodic assessment of progress towards implementing current best practices and to begin to strengthen the comprehensiveness and uniformity of performance reviews.

A standardized benchmarking framework would provide a method to evaluate and discuss general RFMO performance and provide individual organizations a tool by which they can continually track their performance and efforts to achieve best practice. The idea of developing a standard to be used as a benchmarking tool in assessment has already been proposed for at least one specific RFMO best practice, namely transparency of information on compliance, but not for

the suite of best practices as a whole (Gilman and Kingma 2013). The proposed framework could be made applicable to most or all RFMOs by building in customized elements that address the specificities of individual commissions (a process similar to using the common or Kobe I criteria augmented with additional criteria- IOTC 2009; GFCM 2011). It could be used as a tool for self-assessment or could be used as a structure for external or mixed performance reviews. Most importantly, this framework could standardize the criteria and focus of each performance assessment, creating a comprehensive series of benchmarks for each individual RFMOs operations that can be cross-compared with similar organizations around the world with respect to organizational structure and processes in carrying out their mandate. In fact, the literature calls for the development of "a standard set of criteria framed around international obligations…to allow consistent performance evaluations and maximize opportunities for benchmarking and continuous improvement" (Willock and Lack 2006). The recognition of this deficiency was the impetus for the work of Lodge et al. (2007), who developed a *model* for improved governance, but stopped short of developing a standard set of *benchmarks*. According to those authors, "there is as yet no firm consensus as to how objective and transparent criteria might be applied in evaluating the performance of RFMOs" (Lodge et al. 2007). It should be noted that this standardized framework could be quantitative, semi-quantitative, or qualitative; what is important is that it allows for standardization, but also the flexibility to be adjusted based on each individual commission to ensure accuracy.

The development of such a standard framework is made all the more feasible by the current status of the international regulations and literature surrounding the topic of the performance and the evaluation of RFMOs. Some of the literature that has been produced by organizations on this topic is circular in thinking and could be confusing or lead to inaction. For example, consider a

document that compares the performance reviews of five RFMOs that used varying criteria in their reviews using a separate evaluation list called "Criteria for performance reviews" and producing recommendations based on comparison to be considered by these RFMOs (Ceo et al. 2012). How should these additional recommendations should be considered by the evaluated RFMOs? In addition, because of the complexity of the topic, some policy papers choosing to more specifically direct their efforts towards one piece of best practice or a specific subset of RFMOs risk portraying incomplete information. For example, a policy paper published by the Pew Environmental group in 2013 states that "eight RFMOs have conducted 'performance' reviews thus far (IOTC, ICCAT, CCSBT, WCPFC, NEAFC, CCAMLR, NAFO, SEAFO)," which is an incomplete list unless they are using a definition of RFMO that does not include organizations such as the IPHC or PSC (PEW 2013). Finally, attempts towards comprehensive assessment by producing a "coherent picture of performance" via evaluation by several separate frameworks in one performance assessment may not be the optimal structure (CCSBT 2014). Performance reviews can be costly and time-consuming to organizations, and therefore evaluating with multiple frameworks may result in an unnecessary burden, both financially and time-wise, on individual organizations. It also may be the case that multiple assessments could lead to conflicting results, thereby nullifying recommendations for action. A standard framework could address these issues and help to streamline future performance evaluations of all RFMOs now and in the future.

1.5 Exploring the Issues and Barriers to Developing a Standard Benchmarking Framework

A standardized benchmarking framework that strengthens the comprehensiveness and uniformity of performance evaluations for all RFMOs requires that the framework be created through a process with formal intergovernmental legitimacy and encompass the pertinent international processes (including UNGA, UNFSA Review Conference, FAO, CBD, IUCN, CMS, INTERPOL). Because of the varying interests of these groups, it is highly unlikely that this will be an easy or quick process. Moreover, the framework must be reflective of the best thinking on the topic, including recommendations of experts provided by expert panels or published in the peer-review literature. Many of the scholarly and independent standards published have borrowed heavily from intergovernmental sources, but "may also sometimes go beyond them" (Garcia and Koehler 2014). These standards may also be endorsed by some governments in intergovernmental meetings, or cited as important information to consider within performance reviews (such as Lodge et al. 2007), without being formally adopted. This exploration does not fully go into legal analysis of the necessary steps and feasibility of such a process, but it is important to recognize the potential legal hurdles involved in changing any area of RFMO evaluation of performance (McDorman 2005).

Regardless of any potential legal hurdles, there still remain a variety of differences in governance and institutional structure across RFMOs that adds complexity to creating a tool that improves the uniformity of performance reviews. Various leading fisheries scholars have discussed elements of governance and institutions that are important in fisheries management (Hilborn et al. 2005; Lodge et al. 2007; Cullis-Suzuki and Pauly 2010; Pintassilgo et al. 2010). Here I explore three primary elements that, aside from any potential legal issues, may contribute to the

difficulty in developing a strengthened evaluation framework with increased comprehensiveness and uniformity. Each element represents an element of complexity that will need to be addressed in building a framework that is useful for all RFMOs for accurate evaluation and comparison.

I examine elements common to all RFMOs, although they have variable expression or implementation across RFMPs. Note there is disproportionate emphasis on certain commissions based on both their utility for the argument and the amount of information available. For each of the elements addressed, methods of organization that different RFMOs employ (or are inherent in their institutional structure) are discussed with an emphasis on highlighting the broad spectrum of management structures and providing a good basis for comparison. Finally, my use of individual commissions as examples to highlight certain elements is not necessarily a comment on their performance.

I consider three primary elements of the existing RFMOs: the basic institutional structure; the mandate of the organization; and the spatial scale and complexity of managed resources. Assessed within the first element of basic institutional structure are (2.1) the number of member states; (2.2) the differences in size and relative power of each of the member states; and (2.3) the existing decision making structure for each organization. The scope of the mandate of RFMOs is covered second, especially in relation to (3.1) the inclusion of the Precautionary Approach and Ecosystem-Based Management; (3.2) its role in allocation of managed resources; and (3.3) issues surrounding compliance. Finally, the differences in the spatial scale and complexity of managed resources are explored, including (4.1) the number, (4.2) type and (4.3) geographical range of managed fish stocks; (4.4) measures to address bycatch of sensitive species groups; and (4.5) stocks that are managed under the jurisdiction of more than one RFMO.

By summarizing the differences among existing RFMOs, I explore the elements that are most likely to have the greatest effect on the development of a framework that can help RFMOs accurately assess their progress towards best practice and strengthen the comprehensiveness and uniformity of performance reviews.

2 Basic Institutional Structure

Although all RFMOs are intergovernmental regional fisheries bodies or arrangements with authority to establish binding conservation and management measures, the basic structure of each institution varies. It has been suggested in fisheries management that "the primary determinants of success [of a management institution] relate[s] to institutional structure and incentives for participants" (Hilborn et al. 2005). The conditions under which a regime is designed and formed can also directly affect workings of an organization and the likelihood of success in the fulfillment of the regime's mandate (Mitchell 2009). Conditions that can affect successful international action on an environmental problem, in this case the conservation and management of fish stocks, include "the type and number of actors relevant to addressing the problem, those actors' interests and motivations, the distribution of power among them, and the[ir] availability to an appropriate institutional forum," as well as "broader interdependencies among states and long-term policy trends" (Mitchell 2009).

2.1 Number of Contracting Parties to each Agreement

RFMOs differ in the number of member states or "Contracting Parties" to each agreement. Several organizations consist of a defined number of member states, the smallest ones being the International Pacific Halibut Commission (IPHC), the Pacific Salmon Commission (PSC), the

Pacific Whiting Joint Management Committee (PWJMC) and the Joint Norwegian-Russian Fisheries Commission (JNRF), each of which are based on bilateral agreements. The IPHC, PWJMC and PSC are established by conventions between the two Contracting Parties of the United States and Canada and the JNRF, as the name suggests, consists of the two Contracting Parties of Norway and Russia.

There are also many organizations with ten or more of member states, including CCAMLR, GFCM, IATTC, ICCAT, IOTC, NAFO, SPRFMO and WCPFC. A generalizable benchmarking framework must be equally applicable to RFMOs of all sizes. This could pose a challenge, in that the literature suggests that the number of members party to an agreement may substantially alter the workings of an organization, and therefore, how one would accurately evaluate that organization. Hilborn argues that in more complex organizations "competing interests cause a dilution of responsibility and incentives for good economic or biological stewardship" (Hilborn et al. 2005). In contrast, when institutions are simple and there is direct responsibility, managers have better incentives to ensure that management is performed responsibly (Hilborn et al. 2005). Pintassilgo et al. (2010) suggest that the number of members plays a large part in the working success of an RFMO. Their research on economic evaluations of RFMOs shows that larger numbers of fishing states competing for a fish stock result in higher relative gains from full cooperation, but that there is a much lower likelihood of larger RFMOs being able to reach that level of cooperation. Continued cooperation and long-term stability are crucial to effective management by RFMOs (Lodge et al. 2007).

2.2 Differences in Size and Relative Power of Contracting Parties

Differences in the size and relative power of each of the member states may substantially alter the workings of an organization and contribute to both difficulty in effective resource management and in creating a standardized performance review framework (Mitchell 2009). These difficulties are exemplified by inspection of three RFMOs: 1) the IPHC, which has little difference in size and power between the Contracting Parties; 2) the IATTC, which has experienced a divergence of opinion by the Contracting Parties; and 3) the CCBSP, in which one Contracting Party that has ceded power based on lack of participation.

The IPHC: The RFMO for Pacific halibut (*Hippoglossus stenolepis*), the IPHC, consists of two Contracting Parties of similar size and relative power. The formation of the Commission in 1923 was catalyzed by a classic boom-and-bust fishery cycle, which culminated in the fishing industry in both the United States and Canada petitioning their respective governments for relief (Clark and Hare 2006). With two friendly participants (the Contracting Parties) of equivalent power involved in regime design and formation, the IPHC has a reputation as a successful institution that has managed halibut stocks consistent with treaty obligations, and has been "widely praised for its skill in managing a sustainable resource" (McCreary and Brooks 2012; Saltman 2013).

The IATTC: The IATTC provides an example of a commission that has been experiencing disagreement between member countries. The IATTC was established by a 1949 Convention between the United States and the Republic of Costa Rica, *vis* a *vis* their mutual interest in maintaining the populations of yellowfin and skipjack tuna in the eastern Pacific Ocean (IATTC 1949). This convention has since been replaced by the Antigua Convention, which was negotiated to strengthen and replace the 1949 Convention establishing the IATTC and was

proposed in 2003, entering into force in August 2010 (IATTC C-03-02; IATTC 2003). The IATTC currently consists of 21 members.

Recently, the IATTC has expended a large amount of time and effort to reach a consensus over performance evaluation. As of March 2015, the commission has not yet completed a performance review, although documentation from 2012 states that completing a performance review "agreed at the first meeting of the tuna regional management organizations (RFMOs) in January 2007, has been on the agenda for all Commission meetings since June 2007, but the Commission has failed to reach agreement on how to proceed with a performance review" (IATTC-83-13). Since 2007, two competing draft resolutions regarding performance review were presented to the Commission, in essence, creating two separate factions within the body of member states. The first, in June 2009, was sponsored by seven members of the Commission (Costa Rica, El Salvador, Guatemala, Mexico, Nicaragua, Panama and Venezuela), and the second, in 2011, was sponsored by four other members of the IATTC (Canada, United States, Japan and the European Union) (IATTC-83-13; IATTC-H1; IATTC-82-G-1A).

The principal difference between these two draft resolutions is whether or not the Agreement on the International Dolphin Conservation Program (AIDCP) should be included within the performance review of the IATTC (IATTC-83-13). It should be noted that the IATTC provides the Secretariat for the program, but not all members and Cooperating Non-Members of the IATTC are parties to the AIDCP (IATTC-82-G-1A). The 87th Annual Meeting of the IATTC, which adjourned on July 18th, 2014 in Lima, Peru, was marked by the inability of the Commission to come to consensus regarding the performance review, in addition to a variety of other outstanding issues including conservation measures on Bluefin Tuna, a proposal on IUU fishing, issues of governance in regards to the appointment of a new Executive Director, and a

financial and administrative assessment (MARE Newsroom 2014). For this reason the 87th annual meeting was concluded and discussion resumed within the format of an extraordinary meeting in La Jolla from 27th October to the 1st of November.

After eight years and extensive discussions, the Commission finally adopted the terms of reference for the review of the performance of the IATTC in November 2014 (IATTC C-14-09). The terms of reference state several specific areas that the "assessment should contemplate" and it stands to reason that the IATTC would utilize the Kobe I criteria as a framework (as per the tuna commission's agreement in 2007). This extended process, in conjunction with the failure of the Commission to reach decisions on several other issues on the agenda, points to imbalances between the Contracting Parties, especially considering the makeup of the two factions with competing performance review draft resolutions (smaller central and south American countries vs. larger western countries and Japan).

The CCBSP: The CCBSP provides an example of a RFMO in which one Contracting Party that ceded a degree of power based on lack of participation. The CCBSP established an international regime for the conservation and management of Aleutian Basin Alaska Pollock (*Theragra chalcogramma*), to which the parties agreed to convene an Annual Conference and a Science and Technical Committee (CCBSP 1994). The Annual Conference "establishes the annual harvest level and individual national quotas for pollock in the Convention Area, as well [as] other critical decisions such as the terms and conditions for trial fishing in the Central Bering Sea" (CCBSP 2013). But only five of the six Contracting Parties (Japan, Republic of Korea, United States, Russian Federation and the Republic of Poland (E.U.)) have participated in the Annual Conference process, with the People's Republic of China (PRC) participating in only two of the last six Annual Conferences (CCBSP 2013). Consequently, the PRC has no delegate to the

Conference, nor does it have representation on the Science and Technical Committee (CCBSP 2013). Although decisions on matters of substance "shall be taken by consensus," and therefore the PRC still retains its vote, by choosing to not actively participate in the process, the PRC has relinquished the power that comes with participation. According to a statement by the United States, "decisions taken during the Annual Conferences are strengthened when all of the Parties actively participate in those meetings" (CCBSP 2013).

2.3 Decision Making Structure of the Organization

Differences in the decision-making structure of RFMOs may contribute to the difficulty in developing a general evaluation framework that is both standardized and comprehensive. RFMOs employ diverse decision-making structures and also vary in how each Contracting Party is represented within those structures, although the majority use the one state, one vote scheme. There has been some investigation into what might be the optimal decision-making structure for RFMOs in the best practice literature and in performance reviews of specific RFMOs (Lodge et al. 2007; CCAMLR 2008; CCSBT 2008). However, the published literature evaluating RFMO decision-making from a legal perspective is less concerned with identifying the optimal structure and instead emphasizes outcomes. For example, according to McDorman (2005), "the core reality [of] State sovereignty and the consequent need for and influence of political will in RFMO decision-making" is that, "without the will to agree, the details of the decision-making procedures may make little difference." For an evaluation framework to be generally applicable, the differences among RFMOs must be addressed, regardless of whether emphasis is placed on what procedures are in place or the outcome of those procedures.

The precise decision-making structure for each organization is specified within either the Convention or the Rules of Procedure of each RFMO. The methods currently used by one or more RFMOs include decisions made by majority, by consensus (or unanimous), by 2/3 majority, or by a combination of these methods (McDorman 2005). The combined method of decision-making includes that such as used by the WCPFC, where the general rule is that of consensus, but which allows for a weighted voting model if consensus cannot be reached (WCPFC 2004). It has been suggested that the decision-making procedure utilized reflects both when each RFMO was established, as well as the number and the combination of Contracting Parties (McDorman 2005). In a general evaluation framework, this structural variation in decision-making could be overcome by evaluating outcomes or emphasizing evaluation of decision-making procedures according to how well they facilitate the adoption of conservation and management measures in a timely and effective manner. Organizations are likely to have varying levels of success with a specific method of decision-making, although some procedures may prove to be more efficient overall in reaching conservation and management goals in specific organizations. For example, the IPHC has six voting members, three US commissioners and three Canadian commissioners, and uses a concurring vote of at least two of the Commissioners of each Contracting Party (a modified majority vote), which is preferable to a consensus vote given the small number of voting parties (Saltman 2013; IPHC 2014).

Even so, the best practice literature specifically recommends an ideal decision-making structure, suggesting that procedures for decision-making should be reflective of the type of decision required (Willock and Lack 2006; Lodge et al. 2007). According to Lodge et al. (2007), this includes separating decision-making practice into two groups: those concerned with administrative, budgetary and other decisions, and those concerned with questions of substance.

The authors suggest that a "simple majority vote" is most appropriate for the former, whereas decisions on questions of substance, members should "use their best efforts to reach consensus" including the use of a facilitator (Lodge et al. 2007). If efforts to reach consensus are exhausted without success, the authors recommend that for RFMOs with fewer than five members, decisions may be taken by consensus with stipulations for a dissatisfied member to request a review of the decision by the panel, whereas for RFMOs with more than five members, a decision requires a large majority for adoption (two-thirds for or against, rising to three-quarters for RFMOs with more than 12 members). In contrast, the existing international processes are brief on the subject of decision-making and do not recommend any given method, simply stating in their review criteria that evaluation should focus on "the extent to which the RFMO has transparent and consistent decision-making procedures" (Kobe I 2007). Careful consideration needs to be given to the appropriate level of detail required for evaluation of decision-making structure in a standardized framework, as evidenced by the wide range in detail in the recommendations from two sources, as well as the assortment of decision-making procedure in currently established RFMOs.

Although decision-making procedures are firmly ensconced within formal procedural or legal documentation of each RFMO, there are examples of RFMOs that have explored the possibilities of changing certain decision-making structures to better fit the needs of their organization. This potential flexibility may contribute support for a shift to a more universal decision-making structure. In this regard, two examples, CCAMLR and the CCSBT, are illustrative.

A recommendation from CCAMLR's 2008 Performance Review is for the Commission to create a further distinction in the decision-making structure of "matters of substance" by separating substantive issues from matters of implementation. Currently CCAMLR distinguishes between

matters of substance and matters deemed ‘not substantive’, for which they use the simple majority rule. The new recommendation would further parse the matters of substance category. CCAMLR uses consensus decision-making for all decisions under the ‘matters of substance’ distinction, however, the recommendation suggests that CCAMLR, in essence, re-classify its matters of implementation and use majority rule for these decisions similar to its procedure for decisions that are “not [on] matters of substance” (CCAMLR 2008). This change would not require a change in the Convention, because it would simply be a re-classification and all issues would still be voted on via mechanisms established in the current convention. According to CCAMLR, the status of this recommendation is “not yet considered” (CCAMLR 2012).

The CCSBT provides a second example of a commission where changing the decision-making model has been suggested. The CCSBT Convention prescribes that decisions are to be taken by unanimous vote of the members present at the CCSBT meeting (Garcia and Koehler 2014). The 2008 CCSBT Performance Review noted that this mechanism resulted in some decision-making being delayed. The 2014 CCSBT Performance Review, while not offering any specific recommendations on changing the decision-making model, does point to the potential for a change from unanimous to majority decision-making (Garcia and Koehler 2014). This change would require amending the Convention, and although several RFMOs have set a precedent for doing so, this would require a more substantial discussion than a simple re-classification (NAFO, NEAFC, ICCAT and the IATTC have all amended their Conventions for a variety of purposes).

3 Scope of the Mandate

Although all RFMOs are have authority to establish binding conservation and management measures, the mandate of each institution varies, which poses several complexities to the creation of a standardized benchmarking framework. As examples, I consider whether or not the Precautionary Approach and Ecosystem Based Management are included within the mandate of RFMOs, the RFMOs role in allocating managed resources and different methods of ensuring compliance.

3.1 Inclusion of the Precautionary Approach and Ecosystem Based Management

In principle, the mandate of each organization should reflect the UN Fish Stocks Agreement of 1995 (UNFSA), which established the essential, minimum characteristics of RFMOs in binding legal form (Lodge et al. 2007). However, in practice there are many differences, which are due in part to the fact that many RFMOs were established prior to 1995 and most Convention texts have not been updated. The 1995 UNFSA is the first global fisheries agreement that requires the Precautionary Approach (PA) in fisheries management and includes requirements that States "apply a prescribed methodology for precautionary measures, implement improved techniques for dealing with risk and uncertainty, take into account both ecological and socio-economic uncertainties, and develop research, monitoring programs, and plans aimed at conserving non-target and dependent species" (UNFSA 1995). The UNFSA also lists Ecosystem-Based Management (EBM) as one of the general principles that RFMOs should take into account (Nevill 2009). The main goal of EBM in fisheries is "sustainability of catches without compromising the inherent structure and functioning of the marine ecosystem" (Mooney-Seus and Rosenberg 2007). According to Lodge et al. (2007), the overarching objective of an RFMO

should be the "optimal and sustainable long-term utilization" of the resource "subject to the control of fishing capacity and fishing effort commensurate with these objectives." They suggest that this control can be best achieved by, among other things, "the application of the precautionary approach and ecosystem considerations in decision-making" (Lodge et al. 2007).

Each member state is bound to the stipulations of PA and EBM only if they are party to UNFSA. However, UNFSA is considered to be the "most important legally binding global instrument" for fishery conservation and management since the Convention in 1982 and participation is regarded as a way for a country to declare that it is a responsible fishing nation. As of September 2014, 82 States are parties to the agreement, including the European Union, with the majority of fishing nations involved in RFMOs.

Both the pertinent international processes (Kobe I) and the best practices literature include the precautionary approach as set forth in UNFSA and ecosystem considerations as critical to evaluate (Willock and Lack 2006; Lodge et al. 2007; Mooney-Seus and Rosenberg 2007). A general evaluation framework must be flexible enough to accommodate instances in which a RFMO may abide by PA and EBM in practice even though these practices are not expressly contained within their Convention mandate.

3.2 Role in Allocation of Managed Resources

The mandate of each RFMO varies widely with respect to in the allocation of managed resources. There is a wide range of options in the recommendations regarding allocation from the best practice literature versus the international processes, with the former being much more comprehensive and the latter much less so. A standardized performance review framework must be able to take these differences into account, requiring careful consideration of the appropriate

level of detail required for an efficient and effective review. In addition, allocation approaches taken by RFMOs differ and may include the allocation of catch, of effort, or of percentage of Total Allowable Catch (TAC) (Bailey et al. 2013). I highlight the broad spectrum in allocation mandate by inspection of the IPHC and the PSC. Each is a bi-lateral RFMO consisting of the same Contracting Parties, namely, the U.S. and Canada. The IPHC has a mandate that does not cover allocation at the subnational level, while the PSC was developed with the fundamental role and mandate of "dividing [or allocating] salmon harvests" (PSC 2015). It could be argued that the fundamental difference in mandate of these management organizations is due in large part to the biology of the managed resource; namely, salmon are an anadromous, pelagic species with a life cycle allowing them to travel long distances from their natal streams, crossing international boundaries, whereas Pacific halibut are a demersal species with varying patterns of migration among age classes. Any standardized evaluation framework will need to address the mandates of both management bodies effectively.

The IPHC: The IPHC's mandate does not extend to decisions regarding the allocation of the resource or the responsibility of ensuring "the integrity of allocations, including penalties for breaches of national allocation and reductions in future allocations for breaches of other conservation measures" (Lodge et al. 2007). The Commission is charged only with the conservation of the resource and therefore it might be expected that no evaluation regarding allocation would be necessary for the IPHC within a standardized framework (Saltman 2013). However, this structure of separation accords with a recommended best practice that may be a vital part of a comprehensive, standardized evaluation framework (Willock and Lack 2006; Lodge et al. 2007). Lodge et al. (2007) suggest that "decisions on total allowable catch or total allowable effort are insulated and separate from decisions on allocation" and Willock and Lack

(2006) state “negotiations over allocations should be transparent and separate from decisions on the level of catch or effort.” The IPHC by having a mandate that does not cover allocation, although the setting of a TAC for each management area may be a de-facto allocation between the US and Canada because these are exclusive fishing areas, still happens to be consistent with the best practice principle of a scientific commission not making decisions on allocation.

In the IPHC, the authority and responsibility for subnational allocation falls instead to the two Contracting Parties. Allocation of halibut quota in the U.S. is determined through the regional fishery management council system; in the case of the Pacific halibut, it is carried out by the North Pacific Fishery Management Council (NPFMC) and the Pacific Fishery Management Council (PFMC) (McCaughran and Hoag 1992). In Canada, Pacific halibut quota is allocated by the Department of Fisheries and Oceans (DFO) (MacCaughran and Hoag 1992).

The PSC: The Pacific Salmon Commission is the body created by the governments of Canada and the U.S. to implement the Pacific Salmon Treaty of 1985, which functions to “prevent overfishing and provide for optimum production and to provide for each Party to receive benefits equivalent to the production of salmon originating in its waters” (PSC 2014). The PSC’s main functions are to conserve the Pacific Salmon in order to achieve this optimum production, as well as to “divide the harvests so that each country reaps the benefits of its investment in salmon management” (PSC 2015). The two Contracting Parties have worked through the PSC to put to an end to disputes over interceptions by one country of salmon that originated in the other country (USDS 2014). The Commission sets harvest quotas by species or by geographic area and then “the local jurisdictions (states and provinces) then allocate the fish further among competing gear groups and river versus ocean fisheries” (Madson and Koss 1998). Although the PSC does

not deal with allocations to user groups, the fair and just allocation of the Pacific salmon resource to the two Contracting Parties is one of the main tasks of the PSC.

3.3 Compliance and Enforcement

Each RFMO's mandate dictates the scope of the RFMOs jurisdiction and influences the appropriate methods a given RFMO will take to ensure compliance with its management regime. Both the literature on best practices for RFMOs and the pertinent international processes recognize that without a structure of strict compliance from the contracting parties, in conjunction with effective enforcement with which to monitor that compliance, attempts by RFMOs to manage fisheries resources will fail. In fact, the category of "compliance and enforcement practices" (along with resource assessment, distribution of fishing opportunities in line with the resource status and gear limitation) is highlighted in the best practice literature as one of the four basic elements that must be adequately addressed for a fisheries management organization to be considered functional and effective (Lodge et al. 2007). Therefore, it is not surprising that compliance and enforcement is comprehensively covered in the evaluation criteria of both pertinent international processes and the best practice literature. Here I do not provide a comprehensive baseline survey evaluating compliance in RFMOs, although such documents do exist (for a survey of compliance in tuna RFMOs in relation to best practices see Koehler 2013), but it should be noted that this is one of the most difficult and complex tasks for RFMOs to effectively accomplish and has been a key reason that RFMOs have been labeled as "failing" or "in most cases unregulated or insufficiently regulated" (Cullis-Suzuki and Pauly 2010; PEW 2013). This has led to calls advocating for allocation of fishing opportunities to be contingent on the flag State having "demonstrable capacity to effectively manage and control the activities of its vessels and ensure compliance with regulations" (PEW 2013).

Issues of compliance have been widely discussed in the literature, especially among RFMOs charged with the management of tuna and tuna-like species on the high seas, where "access can be difficult to restrict and enforcement actions cannot be comprehensively applied" (Aranda et al. 2012; de Bruyn et al. 2013) and among RFMOs whose members include developing states (FAO 2007). Assessments of levels of compliance among individual countries with international fisheries instruments have also been published. Alder et al. (2001) found that for countries bordering the North Atlantic, despite moderate levels of compliance, most of the fisheries monitored under international fisheries instruments were overexploited as a result of noncompliance.

Evaluation of compliance and enforcement in a standardized framework may present difficulty in that the scale and complexity of compliance and enforcement varies between RFMOs. This variation is directly related to the basic institutional structure of each RFMO, the mandate of each RFMO, and the spatial scale and complexity of managed resources for each RFMO. Here I highlight the crucial role of compliance and enforcement in the overall effectiveness of RFMOs and note that in any evaluation framework, treatment of compliance and enforcement must be comprehensive, but the topic does not lend itself to a standard.

4 Differences in the Spatial Scale and Complexity of Managed Resources

Hilborn et al. (2005) argue that a primary determinant of the success of a management institution is the spatial scale at which regulations are established, data collected and science conducted. They contend that success depends on the spatial scale of management accurately reflecting the spatial scale and complexity of the resources that are managed by the institution (Hilborn et al.

2005). This means that management institutions, such as RFMOs, should be structured differently dependent on the attributes of the resource they are managing. Fishery bodies are designated as RFMOs based on their institutional commonalities, however, there are differences in the spatial scale and complexity of the resources that they manage. Some RFMOs focus on regulating fishing for a particular species or group of species while others focus on a wider marine ecosystem. These differences can influence both the ideal institutional structure and function of each organization and create potential obstacles in development of a standardized benchmarking framework. As examples, I consider the number, type and geographical range of fish stocks managed, measures to address bycatch of sensitive species groups and finally, stocks that are managed under the jurisdiction of more than one RFMO.

4.1 Number of Fish Stocks Managed

RFMOs differ in the number, type and geographical range of fish stocks managed. Several organizations are mandated with the conservation and management of only one stock, including the IPHC, CCBSP and CCSBT, which manage Pacific halibut, Central Bering Sea Pollock and Southern bluefin tuna (*Thunnus maccoyii*), respectively. Pacific halibut has been managed as a single, coast-wide stock since 2006 (prior to 2006, Pacific halibut was managed under the assumption that there were several discrete stocks) (Bailey et al. 2013). Other organizations manage only one taxonomic group of fish, such as Salmonids, although they manage a variety of different stocks that originate in a specific area. The PSC is mandated with the management of salmonids that originate in the waters of the U.S. and Canada, NASCO is mandated with conserving and restoring salmonids in the North Atlantic and NPAFC is mandated with promoting the conservation of anadromous fish stocks in the North Pacific, most of which originate in the waters of NPAFC member countries (NPAFC 2014; PSC 2014; NASCO 2015).

Tuna RFMOs including the IATTC, ICCAT, IOTC and WCPFC, are charged with management of only "tuna and tuna-like species" (FAO 2006). However, several of these commissions are also responsible for management of other, non-fish species like turtles and seabirds. Finally, some RFMOs mange of all of the stocks within their respective Convention Area (there are sometimes exceptions for stocks that are under the mandate of another RFMO- an example would be Southern bluefin tuna found within the Convention Area of ICCAT). These RFMOs, which include CCAMLR, GFCM, NAFO and NEAFC, are usually responsible for the management of tens of species.

4.2 Type of Fish Stocks Managed

Here I use "type" to refer to the three species designations used by CCAMLR: harvest species, dependent species and associated species (CCAMLR 2013). The harvest species, or target species, is the mostly commonly managed by an RFMO because it is the species targeted by fisheries, whether commercial or recreational. Affected non-target species can be divided into two groups, dependent species, which are "those species that feed on the target species or are impacted by the removal of the targets species from the food web" and associated species, which are those "that are impacted directly by the action of fishing, e.g., through bycatch or incidental mortality" (CCAMLR 2013). Increasingly, with the focus on ecosystem based management within RFMOs, all three of these types of fish stocks are considered by management institutions. The Convention of each RFMO defines the specifics of which types are managed by a particular RFMO. CCAMLR, given its mandate to manage the commercial harvesting of Antarctic marine living resources in accordance with the ecosystem approach, monitors all three types through their ecosystem monitoring program, CEMP (CCAMLR 2013). Other RFMOs, such as ICCAT, have responsibilities for target species and species taken as bycatch (associated species), with the

Convention stating, “the Commission shall be responsible for the study of the population of tuna and tuna-like fishes…and such other species of fishes exploited in tuna fishing in the Convention area as are not under investigation by another international fishery organization” (ICCAT 2007). No dependent species are included within the mandate of ICCAT (ICCAT 2007). Finally, some RFMOs are simply mandated with the conservation and management of targeted species (including the CCSBT, the IPHC and the PSC), although they may have members who have made national commitments to reducing bycatch (Small 2005).

4.3 Geographic Range of Fish Stocks Managed

The geographic range of the managed fish stocks also varies between RFMOs, with the most obvious designation being those that manage highly migratory species (HMS), legally defined as those listed in Annex 1 of UNCLOS, versus those that deal solely with non-highly migratory species (FAO 2006). HMS include tuna and tuna-like species, oceanic sharks, pomfrets, sauries and dolphinfish (FAO 2006). Other RFMOs manage species that are anadromous, which include those RFMOs involved specifically in Salmonid management (NPAFC 2014; PSC 2014; NASCO 2015). RFMOs responsible for the conservation and management of species that do not migrate out of the Convention Area include the CCBSP and IPHC.

RFMOs differ substantially in their primary geographic focus as specified by their authorizing language, including their convention mandate. Of these, the difference between a place-based RFMO, such as CCAMLR, versus a species-based RFMO, such as the CCSBT, deserves attention. Many RFMOs have a narrow mandate, whereas CCAMLR has a much wider mandate in that it was the first international convention involving fisheries “to include wide-ranging conservation principles in its objectives based on an ecosystem approach” (Constable et al.

2000). CCAMLR's main objective is to view the Southern Ocean holistically, balancing the demands of fisheries with the requirements of the ecosystem to make sure that it is not negatively affected by fisheries (Constable et al. 2000). This is in contrast to an RFMO such as the CCSBT, with a convention that applies to only the Southern bluefin species. Although the CCSBT Convention does acknowledge "the importance of collecting scientific information relating to…ecologically related species" which are "living marine species associated with Southern bluefin tuna, including but not restricted to both predators and prey of Southern bluefin tuna," their mandate is very clearly species based (CCSBT 1994). Furthermore, because the Southern bluefin tuna (SBT) is a HMS, the CCSBT does not have a Convention Area (CCSBT 2008a). For purposes of monitoring, control and surveillance, the CCSBT cooperates with the other tuna RFMOs to "optimize harmonization; improve global effectiveness; and avoid duplication of work" as SBT migrates into other tuna RFMO areas of jurisdiction (CCSBT 2008a; CCSBT 2008b).

4.4 Measures to Address Bycatch of Sensitive Species Groups

RFMOs differ in their responsibility to manage the bycatch of sensitive species. These differences depend on the relevance of their individual mandate and the geographic location of their Convention Area relative to the conservation of specific species groups. The obligations of RFMOs to conserve sensitive species are addressed by a variety of legal instruments, including the Code of Conduct for Responsible Fisheries and the UNFSA. Moreover, several RFMOs have adopted legally binding or voluntary measures requiring the employment of methods to avoid sensitive species groups, including elasmobranchs, sea turtles, marine mammals and seabirds (Small 2005; Gilman and Lundin 2008). As of 2007, individual actions related to sea turtle bycatch have been taken by GFCM, IATTC, ICCAT, NAFO, SEAFO and WCPFC, while

actions related to seabird bycatch have been taken by CCAMLR, CCSBT, IATTC, IOTC, IPHC, SEAFO, SPRFMO and the WCPFC (FAO 2007; SBWG 2014).

RFMOs may also participate in bycatch working groups or adopt Memoranda of Understanding (MOU). For example, RFMOs concerned with management of tuna (CCSBT, IATTC, ICCAT, IOTC, WCPFC) are involved in the Areas Beyond National Jurisdiction Program (ANBJ), also referred to as Common Oceans, which seeks to "achieve a sustainable and efficient tuna fisheries production and biodiversity conservation through application of an ecosystem approach" (ABNJ 2014). Reducing ecosystem impacts from tuna fishing, including bycatch and associated species, is a main goal of this program, with collaboration between RFMOs, NGOs, industry and other stakeholders to address global issues of bycatch through increased monitoring, control and surveillance, as well as data improvement and harmonization (ABNJ 2014). Efforts in seabird conservation have resulted in collaborative efforts to decrease bycatch. MOUs between the Agreement on the Conservation of Albatrosses and Petrels (ACAP) Secretariat and RFMOs such as the CCSBT, IATTC, IOTC and WCPFC have been established to facilitate scientific collaboration between each ACAP and each RFMO, with a "view towards supporting efforts to reduce incidental bycatch of seabirds, and particularly albatrosses and petrels," in the fisheries managed by each RFMO (SBWG 2014). In addition, conservation organizations such as Birdlife International have provided expert advice and recommendations to RFMOs to address issues of seabird bycatch (Small 2005).

4.5 Stocks that are Managed Under the Jurisdiction of More Than One RFMO

Although it is unusual that a distinct stock of fish is managed under the jurisdiction of more than one RFMO, there are situations where a shared management arrangement is necessary. Such

arrangements require increased levels of cooperation for successful management and enforcement. Here I discuss the example of the shared management of the beaked redfish (*Sebastes mentella*) by NAFO and NEAFC in the North Atlantic Ocean, which illustrates a system of how two RFMOs are managing the same stock. This scenario may become more common as studies have documented important marine ecosystem changes as a consequence of long-term temperature shifts, including shifting habitats for fish and other oceanic species (Axelrod 2011).

The management of the beaked redfish in the North Atlantic Ocean is complicated by both the biology of the species and the geographical area that it inhabits. There appear to be four distinct redfish stock components in the area of the Irminger Sea, which is in the North Atlantic west of Iceland (ICES 2014). The International Council for the Exploration of the Sea (ICES) is the independent scientific body that provides scientific advice to NEAFC, and ICES currently publishes advice for the four separate stocks: the Icelandic Slope stock, the demersal stock (E. Greenland), the shallow water stock (< 500 m) and the deep water stock (>500 m) (ICES 2014). There is also a separate species, the golden redfish (*Sebastes norvegicus*), which is found in the same regions of Iceland and East Greenland (ICES 2014). It is not uncommon for beaked redfish to be taken as bycatch in the directed golden redfish fishery, and there is the potential for increased effort in the golden redfish fishery corresponding with a strong 1990 year class and above average year classes in 1998-2003 (ICES 2014).

Several RFMOs operate in the North Atlantic. Most pertinent to this case are the adjacent NAFO and NEAFC Convention Areas, which are separated by a line running south from the southern tip of Greenland (NAFO to the west of this line, NEAFC to the east). The geographical distribution of the beaked redfish stocks include several regulatory areas of NAFO and several

ICES areas within the Convention Area of NEAFC, as well as the EEZ's of Greenland, Iceland, and the Faroe Islands. Management advice for two of the four beaked redfish stocks, the shallow water stock and the deep water stock, are published by ICES for the region including ICES Subareas V, XII, and XIV (under NEAFC jurisdiction) and NAFO Subareas 1 + 2 (ICES 2014). This means that although the scientific management of NEAFC is responsible for establishing the overall TACs for the stocks of beaked redfish, these TACs will be further divided between two RFMO management schemes. Although all five Contracting Parties of NEAFC (Denmark, representing the Faroe Islands and Greenland, the European Union, Iceland, Norway, and the Russian Federation) are members of NAFO, NAFO includes an additional seven Contracting Parties who have interest in procuring an allocation of beaked redfish (Canada, Cuba, France, representing Saint Pierre and Miguelon, Japan, South Korea, Ukraine and the United States; NAFO 2015; NEAFC 2015).

The management of beaked redfish is further complicated by limited and "insufficient" commercial datasets on several of the stocks, the Russian Federation's decision to set a unilateral quota (which consequently was more than the total quota recommended by NEAFC) for the years 2011-2014 that considers both redfish management units as a single stock, and the continuation of low stock levels following a sharp decline in the 1990's (ICES 2014). In addition, for management considerations, it is unknown whether the geographical distribution of the beaked redfish will be similar over time, as the reasons for the original migration of the stock into the NAFO areas are remain unknown (Thomson 2002). Regardless, this situation has set a precedent for the management of a fish stock which straddles the Convention Areas of two RFMOs.

5 Summary

RFMOs are charged with management of straddling fish stocks and fisheries in the ABNJ. One of the proposed ways to improve the effectiveness of RFMOs is to conduct regular performance assessments to identify gaps and improvements in governance or institutional structure that could be filled, with the idea that effective governance structures will promote successful management outcomes. Recent international pressure to assess performance has highlighted the difficulties inherent in such assessments for RFMOs. These difficulties include whether and how these assessments are performed by each RFMO, whether there exist provisions for regular performance assessment by each RFMO, and whether or not there exists the institutional will to address the recommendations that emerge from such assessments.

States have been called upon to strengthen the comprehensiveness of reviews over time and to develop common criteria that evaluate the core functions and obligations of RFMOs. I explored the argument that standardization of comprehensive assessment criteria consistent with both legal process and the best practice literature could serve to assist RFMOs in periodic assessment towards implementing current best practices, as well as strengthen the comprehensiveness and uniformity of performance reviews, and provide a basis for comparisons across RFMOs. I focused on the approach and criteria used to evaluate RFMOs as these provide the basis on which RFMOs as individual organizations, and as a group, are able to assess, evaluate, and modify their performance to achieve successful management. An effective performance assessment must be based on criteria that highlight the necessary functions of each RFMO.

I found that the diversity of governance and institutional structures among RFMOs adds complexity and presents obstacles to the development of standardized assessments. Although

much of the literature seems to point in the direction of developing and implementing a standard, my analysis suggests that the idea has been proposed without critical examination of the potential impediments. Based on the attributes of RFMOs that I explored – the basic institutional structure, the scope of the mandate and the differences in spatial scale and complexity of managed resources – I conclude that it would be very difficult to create a framework that is at once standardized and comprehensive and at the same time has the promise to lead to meaningful assessment across the diverse arrangements typical of RFMOs. It appears to be the case that a uniform and comprehensive framework will not have utility given the wide range of structures, mandates and complexities of organizations represented by RFMOs. In fact, a standard template might discourage performance review if it is seen as irrelevant or inappropriate.

Despite this, and in the absence of a standard evaluation framework, it remains critical that RFMOs not only continue to assess their performance, but also that they use evaluation criteria that are appropriate to their organization and reflect the best practice thinking, wide body of literature and best professional judgement on the topic. This will demonstrate the commitment of regional fisheries management organizations to meet their individual mandates and improve the status of fisheries management, the sustainability of fisheries, and the livelihoods of those who depend on them.

6 Works Cited

Alder, J., Lugten, G., Kay, R., Ferriss, B. (2001). *Compliance with International Fisheries Instruments.* Sea Around Us: North Atlantic, p. 55.

Alder, J., and Lugten, G. (2002). *Frozen fish block: how committed are North Atlantic States to accountability, conservation and management of fisheries?* Marine Policy 26: 345-357.

Aranda, M., Murua, H., de Bruyn. P. (2012). *Managing fishing capacity in tuna regional fisheries management organisations (RFMOs): Development and state of the art.* Marine Policy 36: 985-992.

Attiany, M.S. (2014). *Competitive Advantage Through Benchmarking: Field Study of Industrial Companies Listed in Amman Stock Exchange*. Journal of Business Studies Quarterly Volume 5, Number 4: 41-51.

Axelrod, M. (2011). *Climate Change and Global Fisheries Management: Linking Issues to Protect Ecosystems or to Save Political Interests?* Global Environmental Politics 11:3, 64-84.

Bailey, M., Ishimura, G., Paisley, R., Sumalia, U.R. (2013). *Moving beyond catch in allocation approaches for internationally shared fish stocks.* Marine Policy 40: 124-136.

Bjørndal, T. (2007). *Technical Study No. 3- Bioeconomic Modelling Relevant to RFMO Resources.* The Royal Institute of International Affairs (Chatham House), London, UK.

CCAMLR. (2008). *Performance Review Panel Report.* Hobart, Tasmania, AUS.

CCAMLR. (2012). *Combined Commission, Scientific Committee, SCIC and SCAF responses to Performance Review recommendations. Responses by report section.* Hobart, Tasmania, AUS. https://www.ccamlr.org/en/publications/combined-commission-scientific-committee-scic-and-scaf-responses-performance-review

CCAMLR. (2013). *CCAMLR Ecosystem Monitoring Program (CEMP).* Accessed March 2015. https://www.ccamlr.org/en/science/ccamlr-ecosystem-monitoring-program-cemp

CCBSP. (1994). *Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea.* February 11, 1994. Washington D.C., United States.

CCBSP. (2013). *Report of the 18th Annual Conference of the Parties to the Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea.* November 4-15 2013.

CCSBT. (1994). *Text of the Convention for the Conservation of Southern Bluefin Tuna (entered into force on 20 May 1994).*

CCSBT. (2008a). *Part One: Self Assessment. Report of the Performance Review Working Group.* Canberra, AUS.

CCSBT. (2008b). *Part Two: Report of the Independent Expert.*

CCSBT. (2011). *Strategic Plan for the Commission for the Conservation of Southern Bluefin Tuna.*

Ceo, M., Fagnani, S., Swan J., Tamada, K., Watanabe, K. (2012). *Performance Review by Regional Fishery Bodies: Introduction, Summaries, Synthesis and Best Practices, Volume I: CCAMLR, CCSBT, ICCAT, IOTC, NAFO, NASCO, NEAFC.* FAO Fisheries and Aquaculture Circular No. 1072. Rome, FAO.

Chatham House website. *About Chatham House.* Accessed 9.13.2013. (http://www.chathamhouse.org/about-us/about-chatham-house)

Clark, W.G., and Hare, S.R. (2006). *IPHC Scientific Report No 83: Assessment and management of Pacific halibut: data, methods and policy.* Seattle, Washington.

Constable, A.J., de la Mare, W.K., Agnew, D.J., Everson, I, Miller, D. (2000). *Managing fisheries to conserve the Antarctic marine ecosystem: practical implementation of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR).* ICES Journal of Marine Science 57: 778-791.

Cullis-Suzuki, S. and Pauly, D. (2010*). Failing the high seas: A global evaluation of regional fisheries management organizations.* Marine Policy 34: 1036-1042.

de Bruyn, P., Murua, H., Aranda, M. (2013). *The Precautionary approach to fisheries management: How this is taken into account by Tuna regional fisheries management organisations (RFMOs).* Marine Policy 38: 397-406.

FAO. (2001). *Report of the Second Meeting of FAO and Non-FAO Regional Fisheries Bodies or Arrangements.* FAO Fisheries Report No. 645. Rome, Italy.

FAO. (2006). *The State of world highly migratory, straddling and other high seas fishery resources and associated species.* FAO Fisheries Technical Paper 495. Rome, Italy.

FAO. (2007). *Review of Measures taken by Intergovernmental Organizations to address Sea Turtle and Seabird interactions in marine capture fisheries.* FAO Fisheries Circular No. 1025. Rome, Italy.

FAO Committee on Fisheries (COFI). (2007*). Strengthening Regional Fisheries Management Organizations and their Performances including the Outcome of the 2007 Tuna RFMOs Meeting, Twenty-seventh Session, 5-9 March 2007.* Rome, Italy.

Fisheries and Oceans Canada. (2011). *Kobe Process*. Accessed April 2015. http://www.dfo-mpo.gc.ca/international/tuna-thon/Kobe-eng.htm

Garcia, S.M. and Koehler, H.R. (2014). *Performance of the CCSBT 2009-2013. Independent Review.*

Gilman, E. and Lundin, C.G. (2008). *Minimizing Bycatch of Sensitive Species Groups in Marine Capture Fisheries: Lessons from Commercial Tuna Fisheries.* IN: Grafton, Q., Hilborn, R., Squires, D., Tait, M., Williams, M. (Eds). Handbook of Marine Fisheries Conservation and Mangement. Oxford University Press.

Gilman, E. and Kingma, E. (2013). *Standard for assessing transparency in information on compliance with obligations of regional fisheries management organizations: Validation through assessment of the Western and Central Pacific Fisheries Commission.* Ocean & Coastal Management 84: 31-39.

Gilman, E., Passfield, K., Nakamura, K. (2014). *Performance of regional fisheries management organizations: ecosystem-based governance of bycatch and discards.* Fish and Fisheries 15: 327-351.

GFCM. (2011). *Performance Review of the General Fisheries Commission for the Mediterranean and Black Sea.*

Grafton, R.Q., Kompas, T., McLoughlin, R., Rayns, N. (2007). *Benchmarking for fisheries governance*. Marine Policy 31: 470-479.

High Seas Task Force (HSTF). (2006). *Closing the net: Stopping illegal fishing on the high seas. Summary recommendations.* Governments of Australia, Canada, Chile, Namibia, New Zealand and the United Kingdom, WWF, IUCN and the Earth Institute at Columbia University.

Hilborn, R., Orensanz, J.M., Parma, A.M. (2005). *Institutions, incentives and the future of fisheries.* Philosophical Transactions of the Royal Society 360: 47-57.

IATTC. (1949). *Convention for the Establishment of an Inter-American Tropical Tuna Commission.* May 31, 1949. Washington D.C., United States.

IATTC. (2003). *Convention for the Strengthening of the Inter-American Tropical Tuna Commission established by the 1949 Convention between the United States of America and the Republic of Costa Rica ("Antigua Convention").*

IATTC. (2003). *Resolution on the Adoption of the Convention for the Strengthening of the Inter-American Tropical Tuna Commission established by the 1949 Convention between the United States of America and the Republic of Costa Rica ("Antigua Convention").* IATTC 70th Meeting. Resolution C-03-02, 24-27 June 2003.

IATTC. (2009). *Resolution on the Review of the Performance of the Organization.* IATTC 80th Meeting. Proposal H1, 8-12 June 2009.

IATTC. (2011). *Resolution by IATTC to undertake a Performance Review of the Organization. IATTC 82nd Meeting.* Proposal IATTC-82-G-1A, July 4-8 2011.

IATTC. (2013). *Document IATTC-83-13: Status of IATTC Performance Review*. 83rd Meeting. La Jolla, CA, USA 25-29 June.

IATTC. (2014). *Terms of Reference for the Review of the IATTC and AIDCP.* Resolution C-14-09, October 27-November 1 2014.

ICCAT. (2007). *Basic Texts, 5th Revision.* Madrid, Spain.

ICCAT. (2009). *Report of the Independent Performance Review of ICCAT.* Madrid, Spain.

ICES. (2014). *ICES Advice 2014, Book 2.*

IOTC. (2009). *Report of the IOTC Performance Review Panel.* January 2009.

IOTC. (2014). *Update on Progress Regarding Resolution 09/01- On the Performance Review Follow-Up.* IOTC-20140S18-07 Rev_1[E].

IPHC. (2014). *Rules of Procedure (Adopted January 19, 1954 and as amended through September 2014).*

Kim, H.J. (2013). *The Return to a Mare Clausum Through Regional Fisheries Management Organizations?* Ocean Development & International Law 44: 205-218.

Kobe I Report. (2007). *Report of the Joint Meeting of Tuna RFMOs.* January 22-26, 2007. Kobe, Japan.

Kobe II Report. (2009). *Report of the Second Joint Meeting of Tuna RFMOs.* June 29-July 3, 2009. San Sebastian, Spain.

Kobe III Report. (2011). *Report of the Third Joint Meeting of Tuna RFMOs.* July 11-15, 2011. La Jolla, United States.

Koehler, H. (2013). *Promoting Compliance in Tuna RFMOs: A Comprehensive Baseline Survey of the Current Mechanics of Reviewing, Assessing and Addressing Compliance with RFMO Obligations and Measures.* ISSF Technical Report 2103-02. International Seafood Sustainability Foundation, McLean, Virginia, USA.

Lodge, M.W., Anderson, D., Løbach, T., Munro, G., Sainsbury, K., Willock, A. (2007). *Recommended Best Practices for Regional Fisheries Management Organizations: Report of an independent panel to develop a model for improved governance by Regional Fisheries*

Management Organizations. The Royal Institute of International Affairs (Chatham House), London. UK.

Madson, P.K. and Koss, W. (1998). *Washington Salmon: understanding allocation.* Washington State House of Representatives: Office of Program Research.

MARE Newsroom. (2014). *European Commission worried at IATTC failure to improve governance and conservation of tunas and sharks.* July 22, 2014.

McCaughran, D.A. and Hoag, S.H. (1992). *IPHC Technical Report No. 26- The 1979 Protocol To The Convention and Related Legislation.* Seattle, WA.

McCreary, S. and Brooks, B. (2012). *Performance Review of the International Pacific Halibut Commission.* CONCUR, Inc.

McDorman, T.L. (2005). *Decision Making Processes of Regional Fisheries Management Organizations (RFMOs).* Conference on the Governance of High Seas Fisheries and the United Nations Fish Agreement May 1-5 2005. St. John's, Newfoundland and Labrador.

Mitchell, R. (2009). *International Politics and the Environment.* Los Angeles: Sage Publications. Pp. 112-145.

Mooney-Seus M.L. and Rosenberg, A.A. (2007). *Technical Study No. 1- Regional Fisheries Management Organizations: Progress in Adopting Precautionary Approach and Ecosystem-Based Management.* The Royal Institute of International Affairs (Chatham House), London, UK.

NAFO. (2007). *Amendment to the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries.* GC Doc 07/4.

NAFO. (2011). *Performance Assessment Review.* Dartmouth, Nova Scotia, Canada.

NAFO. (2015). About the Northwest Atlantic Fisheries Organization. Accessed March 2015. http://www.nafo.int/

NASCO. (2015). About the North Atlantic Salmon Conservation Organization. Accessed March 2015. http://www.nasco.int/

NEAFC. (2006). *Performance Review Panel Report of the North East Atlantic Fisheries Commission, NEAFC.* London, England.

NEAFC. (2015). The Structure of the North East Atlantic Fisheries Commission. Accessed March 2015. http://www.neafc.org/

Nevill, J. (2009). *Overfishing, uncertainty, and ocean governance: Lord Perry's question revisited.* University of Tasmania, PhD Thesis.

NPAFC. (2011). *List of Actions on Prioritized Recommendations from the NPAFC Performance Review Report.* Committee on Scientific Research and Statistics (CSRS). Vancouver, B.C.

NPAFC. (2014). *NPAFC-PICES Framework for Enhanced Scientific Cooperation in the North Pacific Ocean.* 28 April 2014.

Owen, D. (2007). *Technical Study No. 2- The Practice of RFMOs Regarding Non-members.* The Royal Institute of International Affairs (Chatham House), London, UK.

PEW. (2013). *Improving accountability and performance in international fisheries management.* A series of papers on policy options, prepared for the third meeting of the Global Ocean Commission. November 2013.

Pintassilgo, P., Finus, M., Lindroos, M., Munro, G. (2010). *Stability and Success of Regional Fisheries Management Organizations.* Environmental Resource Economics 46: 377-402.

Polacheck, Tom. (2012). *Politics and independent scientific advice in RFMO processes: A case study of crossing boundaries.* Marine Policy 36: 132-141.

PSC. (2014). *Treaty between the Government of Canada and the Government of the United States of America Concerning Pacific salmon.* July 2014.

PSC. (2015). *Management of Pacific Salmon: Role of the Commission.* Accessed March 2015. http://www.psc.org/

Saltman, A. (2013). *Best Practices and the International Pacific Halibut Commission.* A report from the 2013 IPHC Public Administration Graduate Internship. Seattle, WA.

SBWG. (2014). *Sixth Meeting of the Seabird Bycatch Working Group: Review of RFMO Engagement Strategy.* SBWGG6 Doc 11 Rev 1. Punta del Este, Uruguay, 10-12 September 2014.

Small, C. (2005). *Regional Fisheries Management Organisations: Their duties and performance in reducing bycatch of albatrosses and other species.* Birdlife Global Seabird Programme, Birdlife International, Bedfordshire, UK.

Tarasofsky, R. (2007*). Enhancing the Effectiveness of Regional Fisheries Management Organizations through Trade and Market Measures*. The Royal Institute of International Affairs (Chatham House), London, UK.

Thomson, A. (2002). *The Management of Redfish (Sebastes mentella) in the North Atlantic Ocean- A stock in movement.* European Commission Directorate General for Fisheries. Brussels, Belgium.

United Nations. (1995). *Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks ("UNFSA").* United Nations General Assembly Sixth Session, A/CONF. 164/37, 24 July- 4 August 1995.

United Nations. (2013). *Resolution adopted by the General Assembly. 68/71. Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United States Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments.* United Nations General Assembly Doc. A/RES/68/71, 9 December 2013.

USDS. (2014). *International Fisheries Commissions Appropriations.* United States Department of State. Washington, DC.

WCPFC. (2004). *Rules of Procedure.* As adopted at the Inaugural Session 9-10 December 2004. Pohnpei, Federated States of Micronesia.

Willock, A. and Lack, M. (2006). *Follow the leader: Learning from experience and best practice in regional fisheries management organizations.* WWF International and TRAFFIC International.