Imperial College London

Stakeholder perspectives on ecosystem-based management of marine fisheries: A basis for improved seafood sustainability?

Katherine Short

November 2011

A thesis submitted in partial fulfilment of the requirements for the degree of Master of Research at Imperial College.

Cover Photos: Illustrations of the sustainable seafood movement related to tuna. From top left: Greenpeace highlighting the overfishing of Atlantic Bluefin tuna at the Brussels Seafood Show 2008, the MSC certified Japanese Tosakatsuo Skipjack Tuna fishery, the November 2009 cover of Time Magazine and the 2010 private sector pledge to protect Atlantic Bluefin. KShort/WWF.

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Acronyms

AIPCE	Association des Industries du poisson de l`UE / EU Fish Processors Association
CAB	Conformity Assessment Bodies
CCRF	Code of Conduct for Responsible Fisheries (UNFAO)
CEFAS	Centre for Environment, Fisheries and Aquaculture Science, an executive agency of the UK Department for the Environment, Food and Rural Affairs
CSR	Corporate Social Responsibility
CSIRO	Commonwealth Scientific Industrial Research Organisation
EAFM	Ecosystem Approach to Fisheries Management
EBM	Ecosystem-based Management
EBFM	Ecosystem-based Fisheries Management
EU	European Union
FAO	United Nations Food and Agricultural Organisation (UNFAO)
FGD	Focus Group Discussions
FIP	Fisheries Improvement Project
GRI	Global Reporting Initiative
KII	Key Informant Interview
KPI	Key Performance Indicator

MBI	Market Based Incentives
MPA	Marine Protected Area
MSC	Marine Stewardship Council
NGO	Non-Government Organisation
SFP	Sustainable Fisheries Partnership
UBC	University of British Columbia
URL	Uniform Resource Locator

Glossary

Ecosystem-Based Management: Management of the uses and values of ecosystems in conjunction with stakeholders to ensure ecological integrity is maintained, and recognising that ecosystems are dynamic and inherently uncertain. (Ward et al*,* 2002).

Ecological sustainability: The use of species or ecosystems within the capacity of the species, ecosystem or *bioregion* to sustain natural processes, to renew or regenerate consistent with maintaining *ecosystem integrity*, and ensuring that the benefits of the present use do not diminish the potential to meet the needs and aspirations of future generations. (Ward et al*,* 2002).

Focus Groups: A qualitative method that involves unstructured group interviews in which the focus group leader actively encourages discussion amongst participants on the topics of interest. (Schutt 2009)

Interpretivism: The belief that reality is socially constructed and that the goal of social scientists is to understand what meanings people give to that reality. (Schutt 2009)

Key Informant: An insider who is willing and able to provide a field researcher with superior access and information, including answers to questions that arise in the course of the research. (Schutt 2009)

Marine Conservation: is the protection and preservation of biodiversity, its web of ecosystems and their processes in oceans and seas. Marine conservation focuses on limiting human-caused damage to marine ecosystems, and on restoring damaged marine ecosystems. (Norse 2004)

Market Based Incentives: Market Based Incentives (MBIs) are becoming increasingly popular in the political debate on future strategies for biodiversity conservation. Examples of market-based instruments already in place include trading schemes for fishing quotas, agri-environmental schemes, eco-labelling and taxes. (Ecologic 2006)

Snowball Sampling: A method of sampling in which sample elements are selected as they are identified by successive informants or interviewees. (Schutt 2009)

Stakeholder: Any person or group (including governmental and non-governmental institutions, traditional communities, universities, research institutions, development agencies and banks, donors, etc.) with an interest or claim (whether stated or implied) which has the potential of being impacted by or having an impact on a given project and its objectives. Stakeholder groups that have a direct or indirect "stake" can be at the household, community, local, regional, national, or international level. (MSC 2011)

Abstract

The 1992 collapse of Newfoundland cod sounded a loud warning about the need to act more concertedly to prevent further fishery collapses. Since then, the international fisheries management and conservation community, in government and non-government organisations, the fishing industry, and academia, have developed policies, management systems, and tools to enable and deliver improvement in fisheries. Ecosystem-based management (EBM) is a widely accepted approach underpinning this, yet critical obstacles to its effective implementation include the varied levels of understanding of what EBM means across stakeholders and the lack of accessible tools to promote and measure its uptake by the seafood sector in particular. Through key informant interviews, focus group discussions and an online questionnaire, this study assesses the attitudes, perspectives, obstacles and needs of a range of actors in applying EBM. It seeks to understand how to overcome these obstacles and to determine whether the seafood sector can play a more direct role in bringing about better application of ecosystem-based management and thus delivery of marine conservation outcomes.

Key findings are that there is multi-sectoral momentum in implementing aspects of EBM and a clear sense of stewardship across all sectors. The nature of EBM implementation is well-intended and somewhat understood and institutionally supported with resources, particularly in the seafood processing sector but key obstacles exist including insufficiently institutionalised policy and accountability frameworks and poor cohesion between big picture sustainability strategies such as ecolabelling and marine protected areas (MPAs). There is a need to better educate the fishing sector about fishery sustainability solutions and NGOs about the enabling policy framework for those solutions. There is also a need for investment in providing information resources, training and facilitated multi-stakeholder collaboration. Usefully that there aren't stereotypical differences between the sectors shows this is not an obstacle to EBM implementation. These common deep motivations could provide a stronger basis to further shape sustainability interventions and more coherent multi-sectoral and coordinated action. Two overall risks to this momentum and which are opportunities for improvement include the need to deepen both the collaboration between actors and the use of accountability frameworks to track and measure sustainability improvements. Furthermore, the study identified that these gaps could be addressed by capitalising on the evident goodwill and resources of especially the private sector.

Keywords: ecosystem-based, certification, marine conservation, fisheries, stakeholders, sustainable seafood

Words: 5015

Acknowledgements

Thank you Dr David Agnew for your belief in my ideas and support to enter the Imperial College Masters by Research programme. You have challenged me throughout the process from conceptualising my ideas through to analysing the results. You have been on hand to help every step of the way and I know there is much more we can contribute to marine conservation and sustainable seafood together in the future.

Thank you Dr E.J Milner-Gulland for your careful and focused guidance at Silwood and as we worked remotely to get this paper into shape. I genuinely have not had a more thorough, careful, reliable and constructive adviser or supervisor of any project I've undertaken before and it's been a privilege to work with you on this first paper.

Dawn Martin, your support of me and our collegial relationship since we first met in Chicago at the Seafood Summit in 2004 is an inspiration and the access you gave me to work these ideas through together and to SeaWeb's resources have added considerable value to this study. I look forward to progressing these recommendations together, especially at the Hong Kong Seafood Summit in 2012.

To WWF, thank you for the experience and networks that led to many of these ideas and for the time to attend the residential courses at Imperial College. I sincerely hope this paper is a useful contribution to conserving marine ecosystems and fostering fishery sustainability.

Lastly, to my family, first paper complete. My mother passed away between enrolling and commencing this study and so many times she was with me as I walked through the fields around Silwood and the streets of London pondering these ideas. Dad, you remain a reliable coach, friend and standard setter! To my partner Nadine, we have moved across the world during this project. Thank you for your support and our happy home. The second project most definitely won't be as hard!

1 Introduction

This study characterises stakeholder knowledge, attitudes and perspectives towards the use of ecosystem-based management (EBM) and the future of fisheries management to determine if efforts to improve fishery sustainability and marine conservation can be enhanced.

1.1 Context

The precarious state of marine fisheries is a mainstream issue featuring in the New York Times (Broad 2009), on the cover of National Geographic (April 2007), in movies and non-government organisation (NGO) campaigns. Coupled with climate change, acidification and marine pollution, the overall picture is of declining marine ecosystem health (Pauly 2010). Whilst examples of marine fisheries management date back beyond the 1800's British Royal Commissions, marine conservation is relatively young and was built on the 1970's foundations of conservation biology (Norse 2004). Yet two myths have undermined these efforts: i) marine resource inexhaustibility and ii) the appropriateness of single species management. The first arose from Thomas Henry Huxley's misunderstood and often misquoted statement (Huxley 1883):

> *"I believe that it may be affirmed with confidence that, in relation to our present modes of fishing, a number of the most important sea fisheries, such as the cod fishery, the herring fishery, and the mackerel fishery, are inexhaustible."*

Whilst conveniently ignoring the caveat of the then methods of fishing, fishery managers and the fishing industry continue to repeat the inexhaustibility point. This continues today with skipjack tuna which is also thought to be inexhaustible (Agnew 2011). Yet where management is applied, fisheries are relatively healthy (Worm *et al*, 2009; Hilborn 2011; Mora 2009; Grafton 2010).

The single species approach was also inherited from the 1800s naturalists, for example Huxley and Charles Darwin, who specialised further into the taxa of Medusae and Barnacles respectively (McCalman 2009). This persisted into the 20th Century until multi-species, and more recently, ecosystem-based fisheries management approaches arose (Pikitch 2004; Sissenwine 2004; McLeod 2010). This paper is not intended to analyse these and EBM is used herein to these generally more holistic approaches that can combine the strengths of marine conservation and fisheries management. The international conservation NGO WWF was the first to publish a marine fisheries EBM framework (FAO 2008) in parallel with the Food and Agricultural Organisation 2001 Reykjavik Conference Declaration on Responsible Fisheries in the Marine Ecosystem and that led to Technical Guidelines on the Ecosystem Approach to Fisheries (EAF) (FAO 2003). Subsequent fisheries management initiatives underpinning EAF include the 1995 UN Fish Stocks Agreement and FAO Code of Conduct for Responsible Fisheries (CCRF) and the 1996 initiation of the Marine Stewardship Council (MSC). Based on the CCRF, Principle 2 of the MSC's Principles and Criteria for Sustainable Fishing assesses a fishery's ecological impacts, thus theoretically MSC certification can support fisheries to operationalize elements of EBM (MSC 2002). This has recently been ecologically verified (MRAG 2011).

The MSC's market presence and the associated sustainable seafood movement growth have been significant. Initially catalysed by NGO campaigns (e.g. Caviar Emptor), this movement is now global and includes those improving the sustainability of marine-derived seafood, whether farmed or wild.

This is evident in the proliferating sustainable seafood sourcing supply chain commitments, 19 seafood ecolabelling initiatives (Accenture 2009), that over 262 fisheries seek MSC certification and that the global MSC labelled product retail value is USD$2.5 billion dollars (MSC 2011).

Successful EBM requires stakeholders to set management objectives for a fishery especially to minimise the uncertainty associated with the human element (Ward *et al,* 2002; Grieve 2007; McLeod 2009). This is enshrined in the MSC's Fishery Certification Methodology:

> *"To provide the transparency that is required of an international certification scheme for it to have credibility with potential stakeholders, including governments, international governmental bodies (e.g. regulatory bodies, fishery managers), CABs, suppliers of fish and fish products, non-governmental organisations and consumers."*

The emphasis here is enabling trust, yet misses the opportunity to enlist potential stakeholder resources and innovation to strengthen sustainability efforts. As a recent MRAG study notes;

> *"..certification increases communication amongst stakeholders and brings about agreement on what sustainable management would be."*

However, the MSC's late codification of stakeholder engagement led to poor early certification process and mistrust of market based fisheries improvement approaches– especially amongst grass root NGOs. The MSC has rectified this, focussing on enabling NGO participation (MSC 2010). The more recent supply chain supported sustainable seafood initiatives also means that these actors are now relevant stakeholders and given the relatively greater private sector resources they can invest in improving fisheries, they are also potentially an important audience to support with education and training about fishery sustainability and EBM. My experience in working with supply chain companies in over a decade of WWF sustainable seafood work, suggests a latent willingness exists amongst them to contribute further to address the marine fisheries crisis. However, there are important barriers to this which need to be understood and mitigated.

1.2 Aim, Objectives and Thesis Structure

1.2.1 Aim

The aim of this thesis is to identify the barriers to applying EBM to fisheries, which can be addressed within a sustainable seafood context.

1.2.2 Objectives

The research objectives were constructed to ground truth my professional experience and resulting assumption that knowledge about an issue shapes stakeholder attitudes and that when coupled with stakeholders having positive feelings for the marine environment that they are able to foster EBM implementation.

1. To characterise a range of fishery stakeholders' knowledge, attitudes and perspectives to EBM.
2. To determine the nature of the implementation of EBM within their organisations.
3. To understand whether there are obstacles to EBM implementation and to describe them.
4. To propose how to overcome these obstacles, using the evidence obtained during this study.

1.2.3 Thesis Structure

Section 3 describes the marine fisheries crisis and two responses to it; i) ecosystem-based management and ii) sustainable seafood. Section 4 introduces the data collection methods. Section 5 presents the results thematically and documents the main findings. Section 6 discusses limitations, summarises the results according to the objectives and proposes sectoral recommendations and further research needs. Section 7 presents the conclusions.

2 Background

2.1 Ecosystem-based Management – Broadening the Audience

Ecosystem-based management is management of the uses and values of ecosystems in conjunction with stakeholders to ensure ecological integrity is maintained, and recognising that ecosystems are dynamic and inherently uncertain (Ward et al, 2002). Positive signs of ecosystem health are evident where EBM is applied (Grieve 2007; McLeod 2009; Pitcher et al, 2009; Worm et al, 2009; Punt & Essington 2011). However EBM has been the domain of science, policy and the NGO community for the last decade and those investing in improving fisheries along the supply chain are a new important audience to empower to strengthen their contribution towards EBM in marine fisheries. Furthermore, their private sector resources can be aligned with and complimented by public sector and NGO resources to potentially increase fishery improvement.

> *"As champions of ocean health continue to work towards this shift, the immediate challenge is to help stakeholders modify their ideology by building support for actions consistent with ecosystem-based management. In this way, stakeholder groups will go beyond simply understanding that the ocean is in trouble and start to identify—and fix—what needs to be remedied." (SeaWeb 2008)*

Although largely limited to the United States, this 2008 SeaWeb project started making EBM more accessible to non-science marine stakeholders through the use of graphical communication tools and resource management scenario gaming. Exciting new tools continue to be developed such as the graphical presentation within the Atlantis marine ecosystem model. The present tie-up between the Australian Commonwealth Scientific Industrial Research Organisation developing Atlantis, and University of British Columbia's (UBC) Fisheries Centre will only strengthen this (Fulton 2011). These communication approaches are very necessary to demystify and bring alive the traditional graphs and tables of fisheries management. They can enable stakeholders to have a common fishery understanding, to evaluate management options and identify ways to improve fishery sustainability.

2.2 The Sustainable Seafood Movement - Confused or Empowered?

Effective responses to overfishing are intensely debated in academic circles. Jacquet and Pauly (2007) conclude that market-based initiatives alone are inadequate to affect the level of change necessary to ensure the on-going application of sound corporate environmental behaviour, asserting that consumers should not be misled that a system of management or conservation based on purchasing power alone will adequately address the present dilemma facing fisheries globally. They postulate that reliance upon voluntary corporate initiatives cannot ensure on-going sustainability in global fisheries, for which robust regulation, monitoring and enforcement are essential (Wild 2008).

The UBC Sea Around Us Project contributes much to marine conservation through its science and awareness raising. Key outputs, including by Jacquet and Pauly (2007, 2010) have raised awareness about the state of marine ecosystems and fisheries and have improved fisheries policy, management and science investment. However their high media profile also generates confusion and organisational anxiety which obfuscates sustainable seafood initiatives in the supply chain (Baruch 2007). This occurs behind the scenes as the proactive seafood supply chain actors repeatedly have to demystify the debate and enlist NGO partners to help to get their management back on track and investing in change (Edwards, 2011). One of Pauly et al's (2007, 2010) key criticisms is that the multitude of NGO and industry attempts to demonstrate sustainability also creates confusion in consumer's minds; but the repeated denigrating by science of efforts to improve fisheries exacerbates this. Whilst the MSC's continuous improvement addresses their technical concerns, these critics do not propose viable, workable alternatives, and are increasingly abandoned by mainstream funders. In short, this creates unproductive work for industry leaders, provides the laggards with excuses for inaction and delays or worse, deters investment.

The state of marine ecosystems demands that all actors who can positively influence marine ecosystem health must be engaged and empowered to cooperate and support any strategies that can complement ecolabelling, such as marine protected areas. Pauly et al, (2007, 2010) are correct in that no single tool is going to fix the situation. However there is a dearth of international high level conversation between those driving fisheries improvement and those advocating for big picture protection and ecosystem restoration. If such a strategic conversation were established it might enable a scaling up of combined efforts to reduce fishing impacts and other threats to the marine environment.

3 *Methods*

3.1 Research Philosophy

Given the multi-stakeholder nature of the aforementioned challenges and my NGO background, I used a social science interpretivist research philosophy to enable in-depth understanding of participants' experiences (Schutt 2009). Furthermore, my experiential insight of the positive impact cross-sectoral collaboration can have in addressing complex fisheries challenges has generated the assumption noted in section 1.1 and that this study explores i.e. whether latent private sector willingness exists to further invest in improving fisheries.

3.2 Data Collection

Design of the sampling methodology began with informal outreach to potential questionnaire respondents to test initial ideas. This occurred at the January 2011 Seafood Summit in Vancouver, May 2011 European Seafood Exposition in Brussels and at Taking Stock - the 2nd Seychelles Indian Ocean Tuna Conference in April, 2011. The first two are the biggest annual sustainable seafood events internationally. This informed the data collection tool design, which included a questionnaire, Focus Group Discussions (FGD) and Key Informant Interviews (KII) (Figure 1).

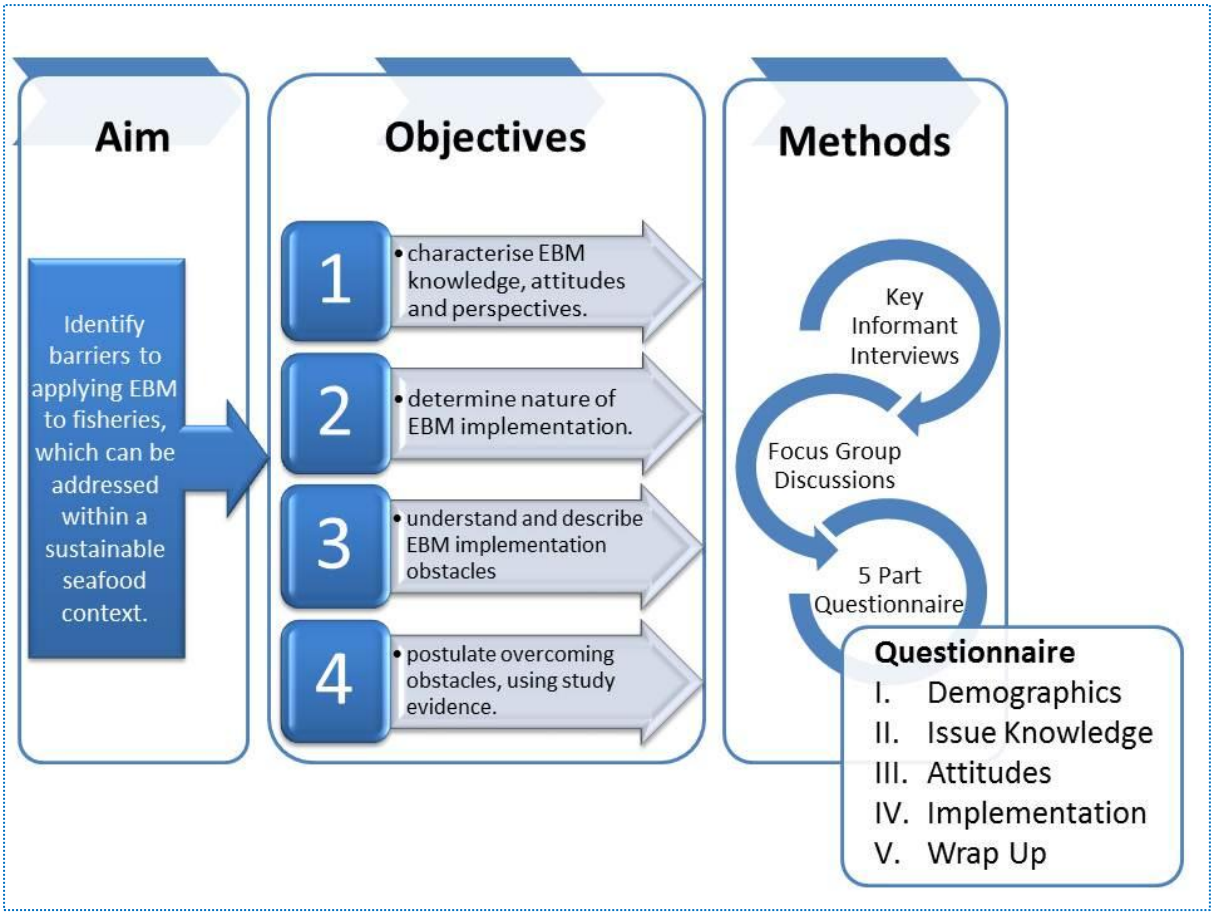

Figure 1. *Overall Study Design*

3.2.1 Sample Selection

The original sample was selected from my professional contact database of 3307 individuals, the 500+ 2011 Seafood Summit registrants and from the Key Informant Interviews (KIIs). Whilst not random, sample selection ensured sectoral breadth and inclusion of individuals beyond those normally engaged in multi-stakeholder initiatives, such as industry lobbyists. The potential sampling universe (Guthrie 2010) is the 44.9 million people directly engaged in capture fisheries, aquaculture or the seafood sector (FAO 2010). This FAO estimate also does not include government fishery managers and the many other relevant NGOs, academics, scientists and experts working in fisheries. The final relatively small sample size (n = 127, Table 1) prevents accurate extrapolation of the results however Section 6 presents some generalisations.

The sample was stratified ex ante using the commonly described fisheries stakeholder categories (science, seafood processing, fishing, non-government and government). An 'Other' category provided for inclusion of independent experts (Table 3). 2 respondents identified themselves as Retail and were grouped for analysis with Seafood Processing. To overcome the potential bias of drawing respondents from my own network, respondents were asked to forward the package of information and survey URL onto contacts to snowball the sample i.e. to increase coverage where at least some of the members of the population know each other (Schutt 2009). Only 4 respondents confirmed they had done this (Table 2) which is a potential limitation of the study (section 6). Anonymity was ensured throughout.

Table 1. *Sample Selection. The original sample and labels is those the questionnaire was sent to. The final sample represents the valid responses received and final groupings as analysed.* the small retail sample was grouped with seafood processing.*

Original Sample		**Final Sample**		**Final Groupings for Analysis**	
	n =	Sector	n =	Sector	n =
Fishing	70	Fishing	9	Fishing	9
Seafood Processing	94	Seafood Processing*	20	Retail & Processing*	22
		Retail*	2		
Policy-Government-Management	68	Government	11	Government	11
NGO	71	NGO	33	NGO	33
Other	70	Other	33	Other	33
Research	98	Research	19	Research	19
Total	**471**	**Total**	**127**	**Total**	**127**

Table 2. *Known and Unknown Respondents*

Sector	**n =**	**Known**	**Unknown**
Fishing	9	6	3
Seafood Processing	20	8	12
Retail	2	0	2
Govt	11	6	5
NGO	33	26	7
Other	33	29	4
Research	19	16	3
Totals	**127**	**91**	**36**

Table 3. *the 'Other' sector broken into type.*

Who were in the 'Other' category?	%
Financial Institution	6
Inter-Governmental Organisation	18
Consultant - industry	6
Consultant - science	0
Consultant - marine & fisheries general	18
Aquaculture	3
Independent	6
Foundation	9
Food Service	3
Media	6
Industry Lobbyist	9
Misc	15

3.2.2 Questionnaire Design

The questionnaire was designed to explore especially study objectives 1-3 (Figure 2) and drew on recent natural resource questionnaire examples (Schofield 2005; Waylen 2010) and 18 online marine conservation surveys found through google searches. Attitudinal questions using Likert scales were used to enable respondents to highlight the perspective that best corresponded with theirs (Guthrie 2010). Biophilia typologies (Kellert 1993) informed the design of attitude questions.

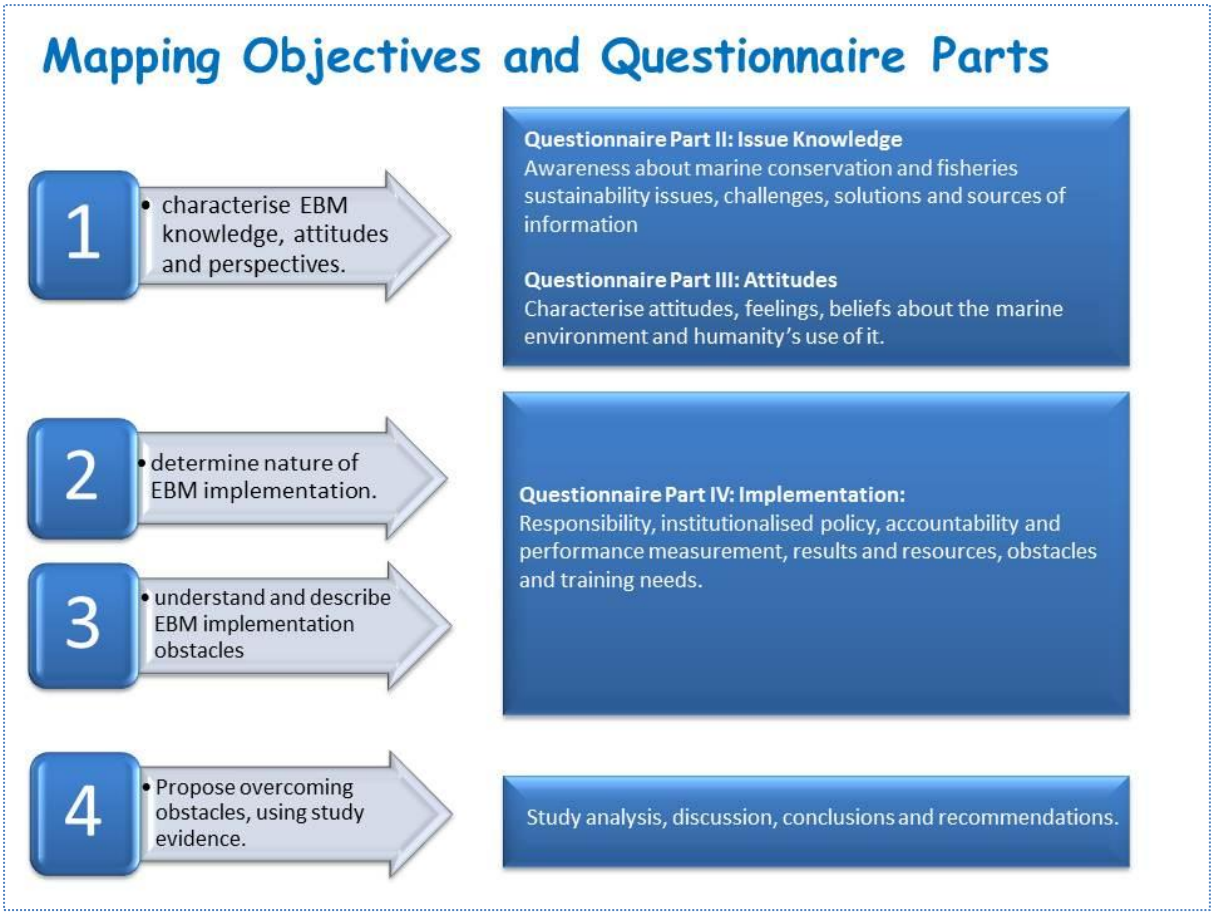

***Figure 2**. The questionnaire was structured to explore Objectives 1, 2 and 3.*

The design was reviewed by my project supervisors and by Jennifer Scott, a SeaWeb Board member and Managing Director of Ogilvy Public Relations Worldwide. The questionnaire would have benefitted from pilot testing to expose the technical issues with both the scoring scale and requiring responses. These errors caused 27 respondents to comment negatively about questionnaire design but their responses still yielded useful information.

The questionnaire was built using the online tool Survey Monkey and emailed to the sample with a project description package, for online completion. Non-respondent follow up was not done because the study had been personally introduced to 97 potential respondents and early returns were strong. The questionnaire is included in Appendix 1.

3.2.3 Key Informant Interviews

I undertook 73 KIIs to scope and conduct the research as well as to enable a dialectical process in which I obtained information from multiple stakeholders in a range of settings. This permitted my understandings and ideas to be refined and the subsequent evolved understandings to be tested on successive respondents (Schutt 2009). Appendix 8.2 lists key informants.

3.2.4 Focus Group Discussions

Two semi-structured Focus Group Discussions (FGDs) with processing and science stakeholders tested the underlying study philosophy and assumptions and aimed to discover unanticipated findings and explore hidden meanings (Schutt 2009; Guthrie 2010). The first FGD was with 17 staff from The Icelandic Group and member companies Seachill and Coldwater Seafoods at their UK Grimsby factory along with Grimsby Institute and Seafish scientists. The Icelandic Group was chosen

as a sustainable seafood leader, especially in the European Fish Processors Association (AIPCE) - WWF advocacy partnership for EU Common Fisheries Policy reform and because Coldwater Seafoods' cooperates with Marks and Spencer to fulfil their WWF Seafood Charter partnership sustainability commitments. The visit included a presentation and discussion of the study and fishery sustainability issues and was followed by a factory tour and 4 KIIs with executives managing sustainable seafood supply. This resulted in 5 completed questionnaires.

The second focus group was at CEFAS and discussed management objective negotiation, MSC and bottom trawling. The range of views presented, especially about bottom trawling which clearly illustrated different stakeholder perspectives. Care was taken to mitigate the risk of individuals dominating focus groups (Guthrie 2010) through: i) using my professional facilitation experience; ii) recording the FGD for note checking; iii) listening more than I spoke; iv) asking broad, open ended questions; and v) having a colleague note-take for subsequent cross reference.

3.3 Data Analysis

Given the questionnaire data was categorical, analysis was based on Pearson's chi-square tests (χ^2) to assess whether there was a significant relationship between a respondent's sectoral affiliation and their responses. Analyses were carried out in R version 2.13.1. The qualitative data, provided as text responses and through the FGDs and KIIs, was thoroughly explored to determine agreement or dissent with the quantitative findings and identify particularly pertinent comments which are presented below. A number of simple calculations were done on the various scoring approaches including averaging and summing e.g. to assess average levels of sector awareness, the scores (4 = high, 3 = medium high, 2 = medium low and 1 = low) were totalled for each sector and divided by the number of respondents in that sector. N.B. all scoring methods are in the Questionnaire (Appendix 1). These and other findings are presented using general descriptive statistics.

4 *Results*

4.1 Analysed Questions

20 questions including 98 sub-questions were quantitatively analysed in relation to the 3 substantive questionnaire Parts and their related objectives (Figure 3).

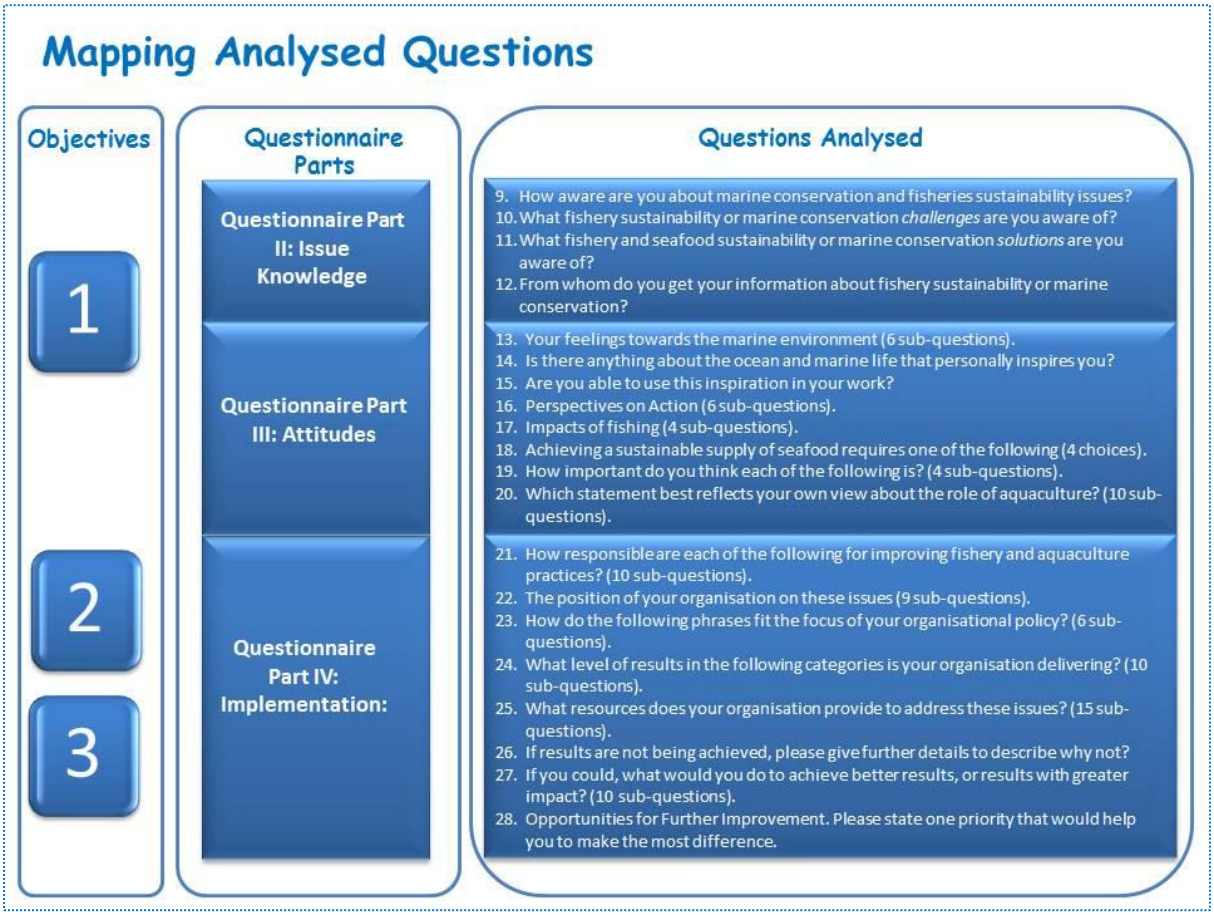

***Figure 3**. How the analysed questions reflect the study objectives.*

4.2 Demographics

The response rate was 26.9% (n = 127). Sectoral responses were fairly evenly spread between the private sector: Retail & Processing and Fishing = 24%; NGO = 26% and Other = 26% followed by Research = 15% and Government = 9% (Figure 4a). 69% of respondents had post-graduate qualifications, 31% were female and 58% were between 40 and 60 years of age. Respondents were mostly both based in western countries and I also know many of them are westerners (Figure 4b; Appendix 8.7). There was no significant relationship between awareness of sustainability issues and either gender or origin.

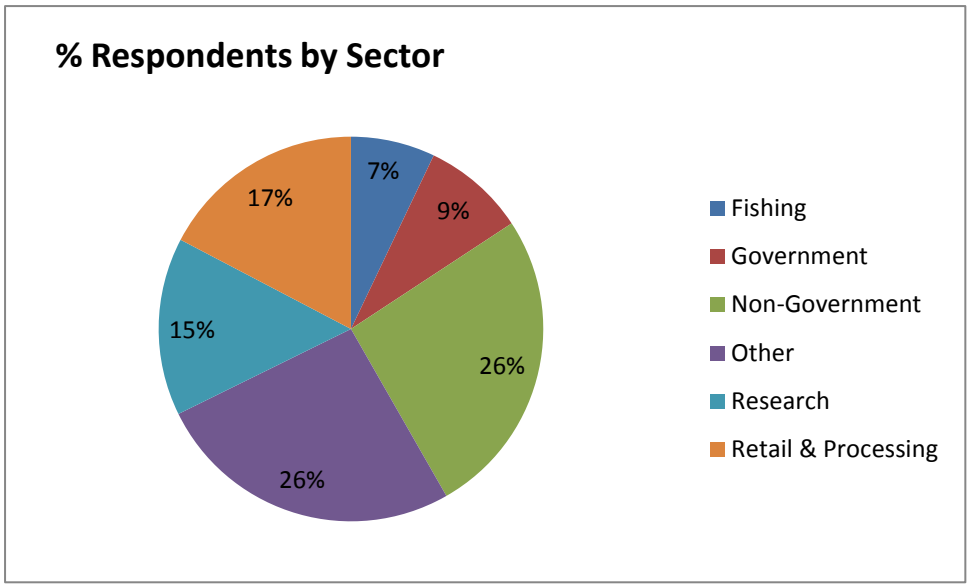

Figure 4a. *Pie chart of percentage respondents by sector.*

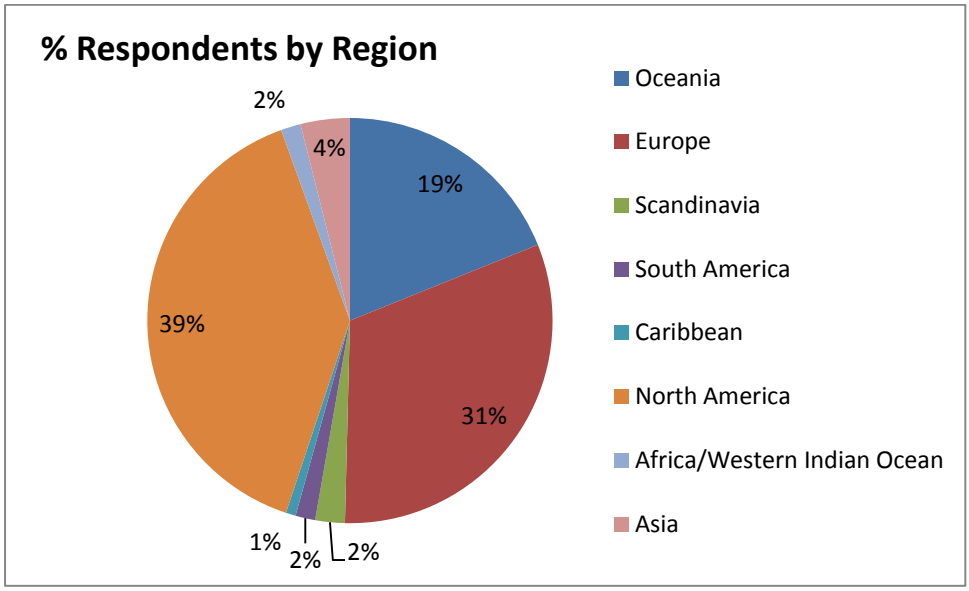

Figure 4b. *Pie chart of respondents by region.* A detailed breakdown is available in Appendix 8.7.

4.3 Knowledge of the issues

Respondents could score their awareness of 8 issues across sustainable fisheries and marine conservation (Figure 5). Totalling the scores, overall awareness was highest in government and lowest in the fishing sector for both solutions and challenges (Appendix 8.4 presents averaged scores). The private sector (retail and processing and fishing) had the lowest average levels of overall awareness.

Challenges

For the challenges, the least was known about habitat damage across the sectors which is surprising given the long running NGO Deep Sea Coalition Campaign to raise awareness about the impacts of bottom trawling. The high bycatch and discards scores do show though that NGO campaigns appear to have raised awareness about this and this is especially relevant given the current European

Common Fisheries Policy reform effort to address this. Only the overall sectoral awareness result was significant (χ^2 = 19.161, df = 10, p-value = 0.038).

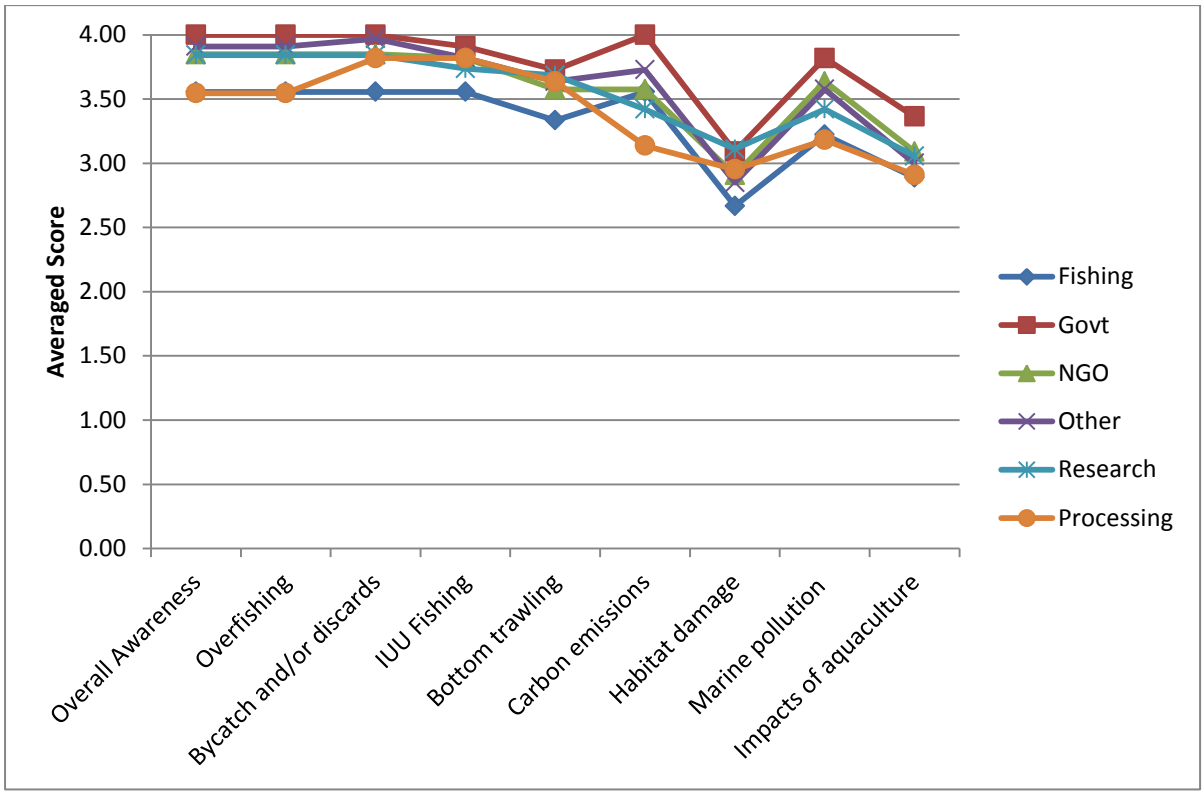

Figure 5. *Averaged levels of awareness of the challenges in sustainable fisheries and marine conservation.*

Solutions

For solutions, respondents had 9 choices of types of management approaches (x axis in Figure 6, complete scores in Appendix 8.5). Only the responses to the awareness of NGO sustainable seafood campaigns (denoted as NGO) were significant (χ^2=26.2, df=15, p-value = 0.036). Respondents were also most aware of the MSC, which could reflect the MSC having reached critical mass exposure levels (Roheim 2011). However it could potentially also reflect a sampling bias given 70% of those sampled were from North American and European markets where the MSC has greatest traction and that those sampled were more environmentally aware.

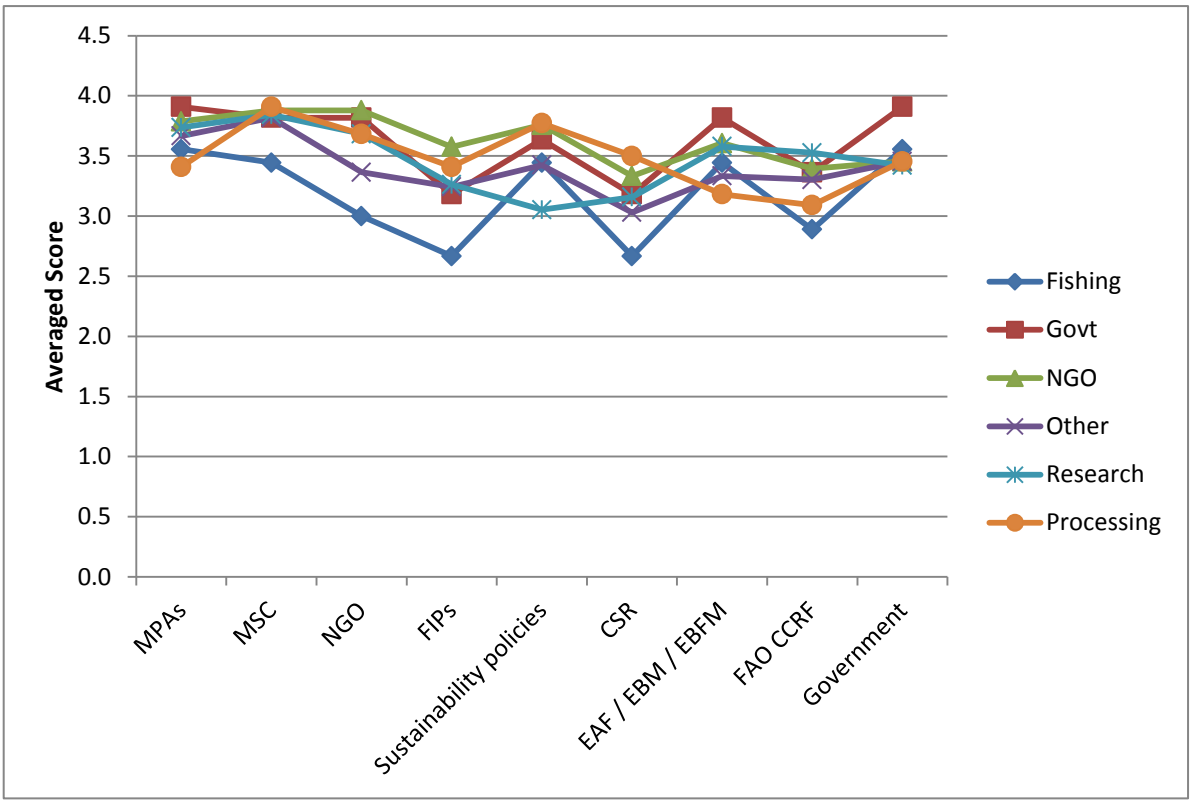

Figure 6. *Averaged levels of awareness of the solutions in sustainable fisheries and marine conservation. New acronyms: FIPs = Fisheries Improvement Projects, CSR = Corporate Social Responsibility, EBFM = ecosystem-based fisheries management.*

To conclude Part I: Issue Knowledge; respondents were asked to rank their fishery sustainability and marine conservation information sources using (Always = 1, Mostly = 2, Sometimes = 3, Don't Know = 0) against the following: industry associations, government, conferences, academia/science, conservation groups/NGOs, media, seafood and the fishing industry trade press. Academia/science scored lowest meaning it was the most common source and a significant result (χ^2 = 24.340, df = 10, p-value = 0.006). Chi-squared tests were also significant for industry associations (χ^2 = 22.920, df = 10, p-value = 0.011).

4.4 Attitudes

Attitudes and feelings towards the marine environment were characterised with 6 questions relating to the themes in Figure 7. Totalling the positive results (scores >0) revealed that 90% of respondents were willing to personally sacrifice to help protect the marine environment and 83% professionally (See Appendix 8.6 for scores). The non-government, other and processing sectors closely identified with the marine environment. 100% of both the government and non-government respondents believed their intervention makes a difference. This dropped to 67% for the fishing industry which could reflect government optimism, non-government idealism and fishing sector pragmatism.

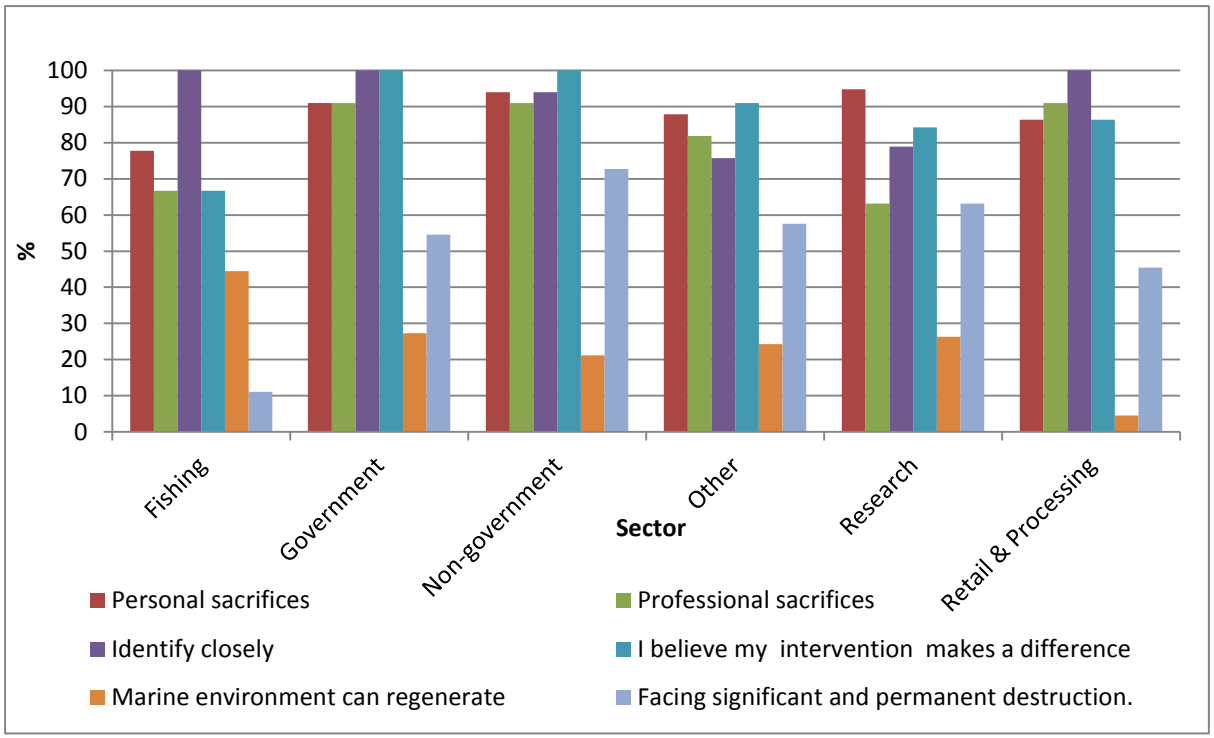

Figure 7. *Bar graph showing the percentage of positive responses (n >0) about feelings for the marine environment using the scoring +2=Strongly Agree, +1 = Agree, 0=Neutral, -1=Disagree, -2=Strongly Disagree, DK=Don't Know. Chi-squared tests showed one question had significant responses: The marine environment is facing significant and permanent destruction ($\chi^2 = 34.309$, df = 20, p-value = 0.024).*

Respondents were also asked whether there is anything about the ocean and marine life that personally inspires them and whether they felt they are able to use this in their work. 86% responded that their positive personal inspiration did contribute to their work. Some of the comments below reinforce this yet there is some dissent also.

The Positives:

> ***Ex-fishing industry scientist, now consultant:*** *"No and Yes. No in that I am equally concerned and inspired by the natural environment generally. Yes in that of course I find the marine environment intriguing and wonderful - over the years because of my work I have developed more knowledge of the marine environment and about utilisation of that environment and its resources. I would not work in the field if I did not care deeply about the environment and about fish stocks but also about the people who utilise it/them."*
>
> ***Food service professional:*** *"I grew up on Cape Breton Island, Nova Scotia and my father was a federal protection officer my grandfather worked in the fishing industry. I have seen the effect of poor fisheries management up close both in Cape Breton and during my years in the distribution industry in western Canada. I strongly believe that the fishing industry has helped shape the world we live in today and its health is inseparable from the quality of life our children will inherit."*
>
> ***Food service distribution:*** *"Absolutely I spend a good portion of my time looking for suppliers that are connected to the fisheries for the long term; suppliers that have core values & economic ownership in doing the right thing! I recognize that there are good practices and bad practices at all levels of the supply chain and that they come with the price. I have a core*

value to influence sales in promoting & supporting suppliers that have a business plan to do the right thing even when it comes with a higher cost."

Seafood processing: *"Yes - I feel passionately that the oceans need protection, and that, in spite of working in the fish industry I can be part of encouraging that - in fact it is BECAUSE I work in the fish industry that I can make a difference. NGOs can and do make their positive mark but it also takes commercial impetus to make substantial change - if there is no commercial impetus to protect, then commercial interests will continue to erode. The difference I can make will be miniscule difference on the grand scheme of things but I believe I can and do make a difference. I am lucky to work for a business that allows me reasonable flexibility to try to make this positive difference too."*

Seafood processing: *"Yes, daily as the Corporate Director of Sustainability for a $600 million corporation committed to Sustainability as one of its major business objectives."*

Seafood processing: *"YES Being born on the Humber and working in the Seafood Industry."*

Dissent:

Fishing*: "while it is an important part of my work to care for the ocean I think that the sustainable seafood movement as a whole loses credibility by basing its authority on how much it cares."*

Inter-governmental policy manager: *"It is the PEOPLE who are involved with the ocean and marine life that inspire me -- not the environment or fish, per se."*

Inter-governmental scientist: *"No. I don't find marine inspiration to be a particularly relevant concept for me. I think fisheries are fascinating given the interplay between ecological, economic and social forces. The tension between science, politics (govt. level) and public opinion (individual level) creates a dynamic, interdisciplinary challenge that is given practical importance through food security."*

With respect to perspectives on action, 78% of respondents disagreed with the statement 'I don't believe there is a need for action to be taken to protect the marine environment' and 50% believed their sector could do a lot more. 67% recognised that actors across different sectors are willing to work together yet 58% thought there was insufficient collaboration across sectors to bring about change. These are strong indicators of preparedness for further action although across the board; there was no significant difference between sectors in their responses.

Big Picture Strategies

Section 3.2 introduced the need for big picture strategies to compliment sustainable seafood initiatives. These include a range of approaches such as MPAs. In exploring the need to achieve a sustainable seafood supply, 81% believed in conserving natural marine ecosystems and developing more sustainable fisheries (Table 4). This tallied with 91% of respondents giving the greatest importance to balancing commercial fishing and marine protection (Table 5) although there were no significant differences between sectors. Given the legislative mandate for governments trying to adhere to the FAO CCRF and the Convention on Biodiversity to achieve objectives relating to marine environment protection, sustaining food supplies and managing fisheries sustainably, the high government scores in Tables 4 and 5 are expected. Interestingly, increasing the scope and scale of

aquaculture was not thought to be important with the fishing sector (22%) yet declaring and protecting special marine areas was high for all sectors except government (Table 5; Figure 8).

Table 4. *Counts of respondents choosing one of the four answer choices (left column).*

	Fishing	Government	NGO	Other	Research	Retail & Processing	Total
Conserving natural marine ecosystems	0	0	2	1	1	1	5
Developing more sustainable fisheries	3	1	4	3	3	2	16
Conserving natural marine ecosystems and developing more sustainable fisheries	5	10	27	29	14	18	103
%	56	91	82	88	74	82	81
No change because the marine environment will regenerate itself without human intervention.	0	0	0	0	0	0	0

Table 5. *The relative importance (expressed as %) assigned to the big picture strategies. Where scores <3 were counted given 1=very important; 2=somewhat important; 3=not very important and 4=not at all important.*

%	Fishing	Government	NGO	Other	Research	Retail & Processing	Total
Declaring and protecting special marine areas.	56	64	79	79	68	86	76
Increasing the scope and scale of aquaculture.	22	91	64	67	47	73	63
Ongoing commercial use of wild fisheries.	89	100	76	79	58	91	80
Balancing commercial fishing and marine protection.	89	100	88	85	89	100	91

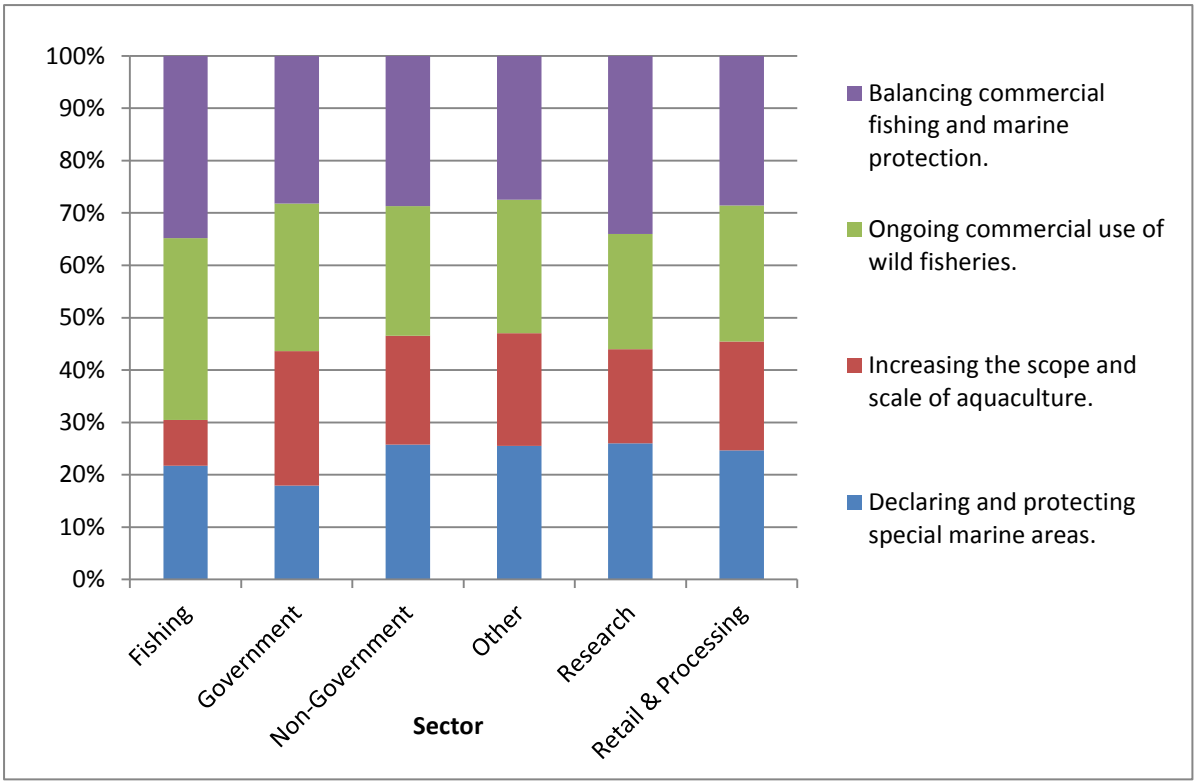

Figure 8. *Sectoral perspectives about the big picture strategies that are needed to ensure sustainable seafood.*

Aquaculture

Aquaculture is widely promulgated as a solution to the marine fisheries and food security crises however its development entails environmental and social problems. Aquaculture perspectives are presented in Table 6 and chi-squared tests revealed that no sectors gave significant responses. At least 10 respondents specifically mentioned that they had direct involvement in aquaculture: 3 from industry, 4 government managers, 1 scientist, and 2 significant processors. 60% of these were supportive of the need for aquaculture to do more to improve its environmental performance although nearly all commented on how much the sector is already doing and that it is difficult to generalise.

Table 6. *The counts for aquaculture response scores >0 whereby + 2 = Strongly Agree and + 1 = Agree.*

	Fishing	Government	NGO	Other	Research	Retail & Processing	Total	%
Increasing aquaculture production is needed for food security.	5	8	21	23	13	15	85	67
Aquaculture can relieve pressure on wild fisheries.	3	6	15	14	7	14	59	46
Increasing aquaculture will only relieve pressure on wild fisheries if alternative (non-wild fish) feed sources are found.	6	4	20	18	10	13	71	56
The aquaculture sector needs to invest in technological advancements to address the impacts of aquaculture	9	7	27	27	16	20	106	83

operations.								
There are cost-effective opportunities to move towards cleaner, less impactful aquaculture operations.	4	6	25	22	14	15	86	68
Best practice standards are needed to address the impacts on the marine environment.	9	9	32	28	16	20	114	90
The use of marine space needs to be better managed to reduce conflict amongst different users.	6	9	31	30	15	16	107	84
The aquaculture sector is doing enough to improve its environmental performance.	0	2	1	2	0	2	7	6
The aquaculture sector needs to do more to improve its environmental performance.	9	7	30	23	14	15	98	77

Related comments from two government officials are insightful for guiding future sustainable seafood work on aquaculture:

> *"Training/informing NGO's of the real situation related to aquaculture rather than what is perpetuated in the popular press would be productive for everyone. There are of course issues that need to be addressed. However, when NGO's focus on reporting in an unbalanced way - it takes resources away from making progress on the real issues."*

> *"It would be nice to see as much attention focused on impacts of agricultural run-off and coastal pollution as is being focused on aquaculture."*

4.5 Implementation

EBM implementation was assessed through exploring responsibility, organisational policy, accountability, availability of enabling resources and results. Some of the comments received about this section indicated this question was better suited to corporate structures.

Responsibility

The actors possibly responsible for implementing EBM were scored and showed a clear trend with most responsibility falling on the resource user, next their industry organisation and the regulator and least of all on the fish eating public and chefs (Figure 9). The low emphasis on the last two is interesting given the use of high profile NGO campaigns to stimulate consumer demand for sustainable fish and the use of celebrity chefs to highlight sustainable seafood. However, these are only awareness raising tactics and not directly related to responsibility.

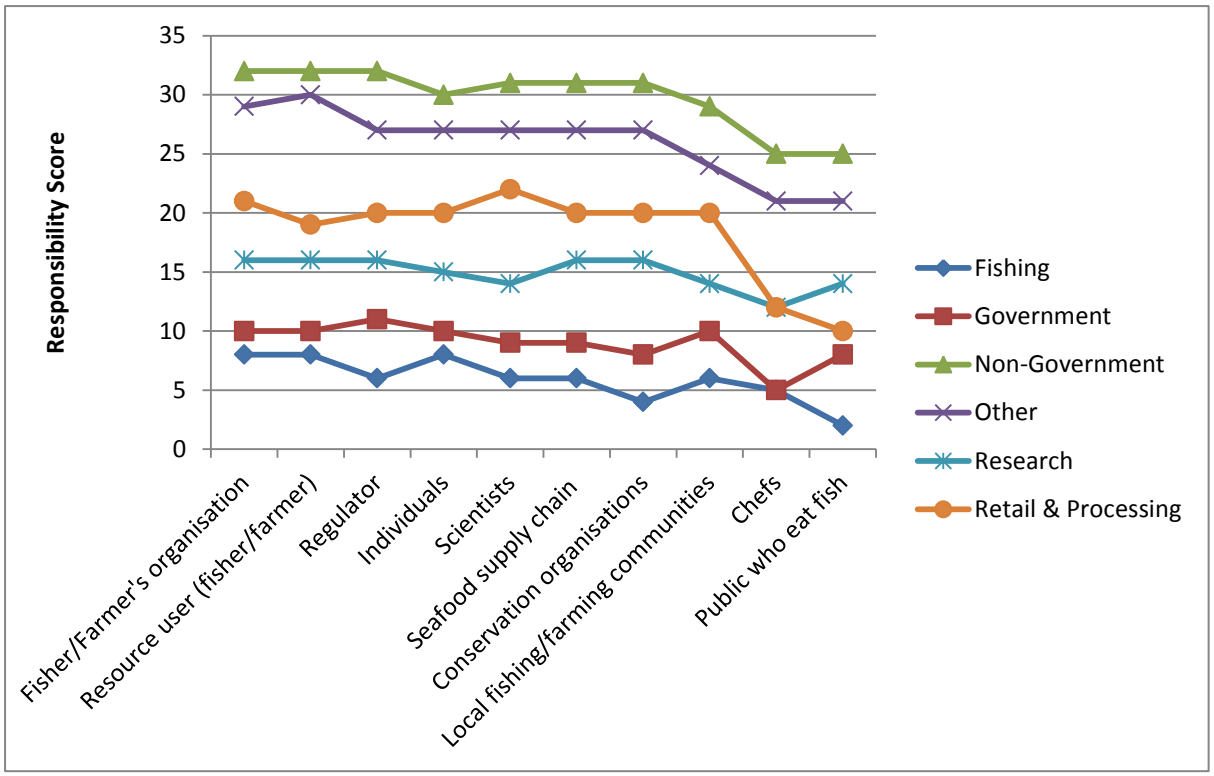

Figure 9. *Responsibility scores by sector. These were calculated by summing results >0 whereby + 2 = Strongly Agree and + 1 = Agree to the question: How responsible are each of the following for improving fishers and aquaculture practices? The intervals relate to the size of the sectoral group i.e. Fishing n = 9, Government n = 11, NGO n = 33, Other n = 33, Research n = 19 and Retail and Processing n = 22. The influence of sector on the proportion of respondents indicating low, low-medium, high-medium and high responsibility, was tested using chi-squared contingency tables. Significant results were found for sectoral responses for responsibility by the regulator (χ^2= 34.801, df = 20, p-value = 0.021, the public who eats fish (χ^2= 36.941, df = 20, p-value = 0.012), the seafood supply chain (χ^2= 35.692, df = 20, p-value = 0.017), conservation organisations (χ^2= 46.211, df = 20, p-value = 0.001) and scientists (χ^2= 33.64, df = 20, p-value = 0.029).*

Key Performance Indicators

Organisational and individual accountability for delivering results was assessed, and particularly scientific and Other respondents, noted their organisations did not use Key Performance Indicators. Some remarked that KPIs were considered to be more suitable for corporate environments. The highest use of KPIs is in government whilst research organisations have the lowest use (Table 7).

Table 7. *The use of key performance indicators relating to fisheries or seafood sustainability at organisational and personal levels.*

%	Organisationally	Personally
Fishing	67	44
Government	91	64
Non-Government	73	61
Other	39	39
Research	37	32
Retail & Processing	55	9
Total	57	49

One government aquaculture manager added:

> *"If through your research you could stress the need for, and contribute to moving toward establishment of International Standards for the Key Performance Indicators (KPI's) for sustainable aquaculture that would be a positive development."*

Organisational Policies

Some bigger seafood companies have corporate environmental policies and report on their sustainability programmes and the new 2010 Global Reporting Initiative Food Processing Sector Guidelines (GRI 2010) should further professionalise this as their uptake increases. There appears to be a relatively high presence of formal policies relating to marine conservation, fisheries sustainability, EBM or seafood sustainability for Fishing, Retail and Seafood Processing, NGO and Government (Table 8). This may illustrate that the sample is more environmentally aware overall and be a potential limitation.

Table 8. *The presence of an official or formal policy i.e. objectives, and/or policy statements, and/or, vision, and/or, goals about marine conservation, fisheries sustainability, an ecosystem-based approach or seafood sustainability.*

	Yes	%
Fishing	7	78
Government	10	91
NGO	27	82
Other	22	67
Research	8	42
Retail and Processing	21	95

The focus of organisational policies was measured through the goodness of fit against five choices (Table 9). iii) Sustainability scored highest followed by v) Balancing. Chi-squared tests showed that responses at a sectoral level were not significant and that the language differences between the natural and utilitarian perspectives were indistinguishable. This may have been because they were a) too subtle, b) unclear to non-native English speakers, and c) masked by the small sample size.

Table 9. *Total scores for the goodness of fit of institutional policies about marine conservation and sustainability (+ 2 = Very Good Fit, - 2 = Very Poor Fit.)*

	Fishing	Government	NGO	Other	Research	Retail	Processing	Total
i) Conservation of marine ecosystems, the physical environment and nature (*A 'natural' perspective).*	2	2	14	5	1	0	5	29
Don't Know	1	0	2	3	4	0	0	10
ii) Conservation of marine resources (A *'utilitarian' perspective).*	2	4	9	5	3	0	4	27
Don't Know	0	0	2	3	4	0	0	9
iii) Sustainability of	6	9	13	15	4	1	11	59

the use of marine resources								
Don't Know	0	0	2	3	4	0	0	9
iv) Maximising profit while minimising environmental harm	3	2	4	7	2	0	6	24
Don't Know	0	0	2	3	4	0	0	9
v) Balancing environmental benefits and economic gain	2	3	8	16	5	1	7	42
Don't Know	0	0	2	3	4	0	0	9

Levels of Results

The level of results being delivered in the specified policy areas plus a further two categories were assessed (Table 10; Figure 10). Across the board, high results were claimed for the general statements relating to sustaining the use and management of marine resources and improving the information.

Table 10. *Results being achieved in focal policy areas whereby high = + 2, positive = +1 or + 2 and negative = -1 or -2. (See Appendix 8.8). The influence of sector on the proportion of respondents indicating low, low-medium, high-medium and high results being achieved, was tested using chi-squared tables. Results were significant for responses to: Maximising profit while minimising environmental harm (χ^2= 37.615, df = 20, p-value = 0.009) and: Improving fisheries management regulation and policy (χ^2= 32.969, df = 20, p-value = 0.034)*

Focus of Policy	High	+	-
Conservation of marine ecosystems and the marine environment.	24	75	4
Conservation of marine resources and nature.	22	74	4
Sustainability of the use and management of marine resources.	38	91	3
Sustaining seafood supplies.	32	71	5
Securing our business's resource base.	14	47	12
Balancing environmental benefits and economic gain.	16	71	10
Maximising profit while minimising environmental harm.	7	38	18
Improving the data, science and information base upon which to manage fisheries.	43	90	4
Improving fisheries management regulation and policy.	39	92	5

When questioned about how to deliver better results, the only significant responses related to improving access to industry associations (χ^2=38.732, df = 20, p-value = 0.007) which points to these organisations needing to sharpen their EBM and sustainable seafood awareness. Appendix 8.9 gives the 34 verbatim training comments which indicate a clear need to further demystify EBM.

The following relevant comments reflect the potential to deliver greater results:

> ***Processing:*** *"It's difficult to isolate what we are delivering in what is a collaborative approach with competitors. This is the hardest section to answer as so much is 'in progress' yet holds out promise of success."*

Processing: *"For crab from Asia we have organized fisheries producer associations to address crab fishery sustainability, and we have organized the U.S. importers around the same issues and it is the importers that are funding the majority of the projects that make up the in-country fisheries improvement plans."*

Processing*: "We are dependent on parties in the supply chain and one of our tasks relates to convincing others to join and take action. Alone we can't do much."*

Government*: "The science we follow is based on single stock principles. It appears that people are afraid of using ecosystem approaches because it might reveal how questionable the ICES stock assessments really are. This will undermine our government's and EU policy. No politician wants to take that responsibility."*

Institutional Investment and Exploring Resource Deficits

Levels of organisational investment in providing resources were explored and gave significant responses for resource accessibility in the areas of internal and external communications (χ^2= 31.360, df = 20, p-value = 0.051), effective planning (χ^2= 33.199, df = 20, p-value = 0.032) and use of partnerships with conservation organisations (χ^2= 32.225, df = 20, p-value = 0.041) (Figure 10). However there are financial resource deficits for the NGO, other, retail and processing sectors and for processing and retail, a deficit of online research and training.

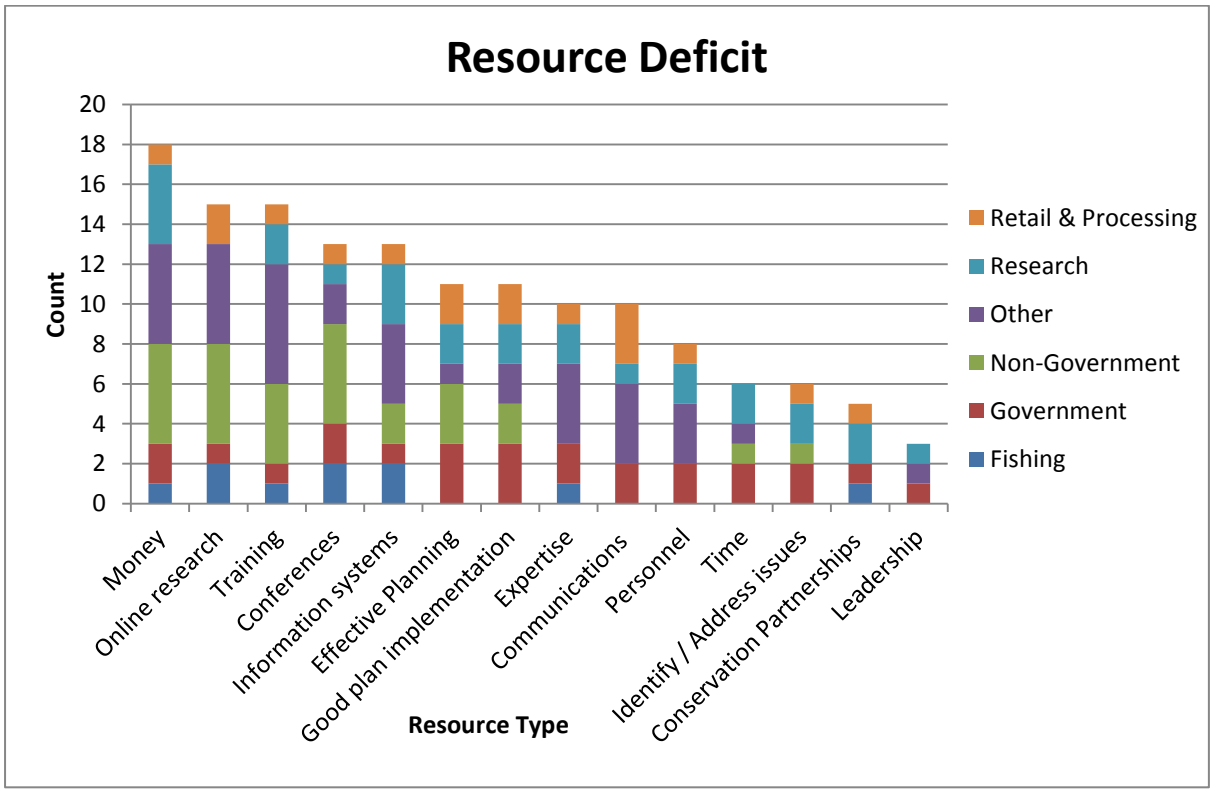

Figure 10. *Where there are deficits of specified resources. Counts of n < 0 where +2 = readily accessible, +1 = accessible, 0 = neutral, -1= there is a deficit of this, -2 = there is a strong deficit of this.*

4.6 Respondent Priorities and Final Comments

Appendix 8.10 contains the full respondent comments on one priority and any final thoughts. Key points that reinforce the study findings and/or significantly dispute them are presented below.

One Priority

Fishing

"Better information on shared resources between stakeholders would take a lot of the "politics" out of sustainable decision making."

"Keep training and informing the crews and fishermen."

Government

"Concrete and measurable objectives that force confronting trade-offs."

"More money and even stronger pressure political pressure/emphasis on sustainability.

"Secure independent scientific advice - this is a matter of funding and quality control at national and regional level."

"Bring together diverse communities for win-win ideas that make progress more politically feasible."

Non-Government

"Create a top notch think tank (for free) where governments could seek advice and be advised on what to and how to do it (e.g. access to funds to support their needs."

Other

"Cross organisational work on ocean governance and management issues."

"To clearly articulate to Ministers of Finance - and not Ministry of Fisheries - the increased economic benefits for long-term licensing and equally show the economic damage of depleted stocks. Scientists should also learn how the industry really works and be prepared to listen as well. Most development countries are only swayed on economic reasons."

"Bring more diverse interests to the table to agree on common goals, frameworks, and metrics."

"Fishing organization trainings & empowerment."

"I think better education of fishermen and their representatives."

Research

"Eliminate doomsday media campaigns, and stop funding researchers that only produce diagnostics, and inventories of problems without ever producing practical solutions."

"Better application of scientific principles and less mindless support of dramatic dogma."

"Growth in the number of researchers engaged with seafood sustainability research."

"Broadening responsibility and accountability of all stakeholders in the fisheries/marine environment management sector and for all users of marine resources."

Processing

"Believe it or not, just some administrative support. I get bogged down with basic admin."

Final Comments

It is of note that these comments were read after the result analysis and therefore given that many of them reinforce the study findings, this is a particularly strong result.

Fishing

"Ecosystem science is, in my view, at a very early stage of development. Trying to set up management systems using it as a base is fraught with difficulties. By way of analogy, enthusiasts for it are like inventors proving a process in a lab; it is a long way then to a pilot plant and then full scale production. We are at the phase of where some of the concepts/research do warrant moving to pilot programs, but far away from the level of certainty as to development and application that warrant full scale deployment. Regrettably the enthusiasm of the 'inventors' is running way ahead of the hard effort still to be done in application. Without more attention to management and application the result might end up being similar to integrated coastal zone management, where it is widely agreed it is a good idea, but it is not really implemented."

Government

"Such questionnaires are difficult to answer properly because your perceptions when formulating the questions are not necessarily obvious and clear to the respondents. One dimension which is missing is that to me the development of an EAM has been and continue to be a gradual process, full of small improvements step by step as the scientific knowledge and evidence is there and the political maturity/pressure is strong enough. Political change also has a strong tendency to occur as a result of crisis; change does not come before it is obvious and necessary."

"I have accepted to participate in this survey but I am not certain its design is quite correct, I can see certain biases. The most essential basis for improvements is to deal with fishery like any other economic activity, deal with fishermen the same way we deal with farmers and miners, regulate their impacts on nature, and recognise the need for better prioritisation in national agendas. As it is today, fisheries are a priority nowhere in the world except in Iceland (and even there, it comes far after the banking crisis). It is not possible to pretend serious improvements like this."

"It is very important area the fragmentation of debate across organizations (forum hopping) with different clientele, the diversity of approaches in isolation of mutual needs etc has confused the debates and solutions beyond what is feasible. There has been a retreat in our own organization from allowing people to work with even reasonable ENGOs because of backlash and optics from extremist views. Similarly fear among industry prevents progress as well finally these issues are now becoming geopolitical with the attempt to 'package' together unrelated issues is a killer to the agenda. Witness the packaging together of biodiversity outside 200 miles with insistence of G77 on "common heritage of mankind issues' as a trade-off is a killer. We need some reasoned middle of the road literate and win-win debate and PRACTICAL solutions to bridge, not divide. The politicization of the debates on oceans is going to kill progress."

Non-Government

"One obstacle is that the discussion around sustainable fisheries is currently lopsided, and I thought that was reflected here."

"I think the accountability of managers responsible to make these decisions should be there. A scorecard on the performance of government officials with respect to the different shortcomings would be a good way to impose better performance."

"Would be great if conservation organizations could understand and work within their common overarching objectives, recognize that their differences present opportunities, and not compete with or try to undermine each other. Achieving sustainable use of marine resources and maintaining biodiversity are huge, huge jobs, worked on over long timescales. Therefore there really aren't resources to spare on in-fighting and battles in the media, etc. Just need to get on with it already"

"Cross sector communication and more education within and across sectors."

Other

"The questionnaire seems to presuppose that the problem of the world's fisheries is lack of sustainable use / conservation of marine resources. For this reason I found many of the questions to be self-serving rather than inquisitorial - it matters little what I might think about conservation if the management responses do not address the underlying causes of over-use / abuse of the marine environment. Defining the problem in this way leads to a whole lot of unclear questions that fail to address the key causes of overuse of marine resources and illicit confused responses for this reason. Perhaps it would be useful to define the problem of overuse / abuse of the marine environmental as one of open / unconstrained access to a (now) scarce resource and then see how the problem is best addressed. This would place a greater focus on the economic and social benefits of marine resource use. As noted above it is simplistic to think that 70% of the planet can and should only produce what is naturally possible by managing marine ecosystems in a steady state - this is not a long term sustainable objective in the face of population increase and increases in the standard of living of people. Any policy that proceeds on such a foundation has a poor long term future in my view."

"I think the survey raises good questions about issues relating to sustainability but I did not see many questions that might shed light on the "how" all sectors could work better collectively and collaboratively. Perhaps there is opportunity in the research to gain greater understanding of strengths and weaknesses in that aspect."

"The value to society of ecosystem based management has to be better described."

Research

"Industries should increase their investments in cleaning up fisheries."

"Funding agencies forcing egocentric research groups to work together with measureable targets relating to marine conservation and sustainable fishing rather than just counting publications in a highly competitive environment that reduces cooperation"

"Slightly difficult survey to answer for an academic as we should have a role of providing objective and independent research, not one of being advocates on one side or another.

Thus, we also do not have formal organizational policies, but we can provide leadership, education, and outreach to the public to inform on issues."

Processing

"Global trade should participate to the financing of the specific research and scientific effort to collect the right data for the right actions to be taken in sustaining marine conservation rather than just asking to the up steam of the supply chain the financial effort."

5 Discussion

The study achieved the first two objectives to characterise stakeholder knowledge and attitudes and relate them to implementation levels finding that there is a clear sense of stewardship across all sectors as expressed by feelings for the marine environment and a willingness to sacrifice to act to address its decline. The study fulfilled objective three by finding that the nature of EBM implementation is well-intended, somewhat understood and institutionally supported with resources, particularly in seafood processing. It identified obstacles including insufficiently institutionalised policy and accountability frameworks and poor cohesion between big picture strategies such as ecolabelling and MPAs. There is a need to better educate the fishing sector about fishery sustainability solutions and NGOs about the enabling policy framework for those solutions as well as for investment in providing information resources, training and facilitated collaboration.

Significant results were found for responses across these objectives including:

- the relatively high levels of overall awareness and especially of NGO sustainable seafood campaigns,
- that information is most commonly sourced from academia/science and industry organisations,
- that most respondents strive for balance in organizational sustainability policies, and;
- that across the sectors there is,
    - agreement that the environment is facing significant and permanent destruction,
    - strong preparedness for further action,
    - agreement on the primary role of the regulator, and;
    - use of personal inspiration professionally.

Usefully that there aren't stereotypical differences between the sectors shows this is not an obstacle to EBM implementation. These common deep motivations could provide a stronger basis to further shape sustainability interventions and more coherent multi-sectoral and coordinated action especially as effective EBM requires meaningful stakeholder input (McLeod 2009, Ward et al, 2002, MSC 2011). This has verified the study assumption that knowledge about an issue shapes stakeholder attitudes and that when coupled with stakeholders having positive feelings for the marine environment that they are able to foster greater implementation of EBM. In organisational psychology terms these are the links between emotion, behaviour and outcomes (Baruch 2007).

Although the study introduced elements of EBM, there were methodological limitations in using a questionnaire and time limited discussions that insufficiently enabled the complexity and application of EBM to be fully explored. Further limitations were the small sample size and that respondents appeared to be from the more environmentally enlightened end of the awareness spectrum. Deeper

penetration into the sectors and conducting non-respondent follow up could increase the sample size in future studies. Furthermore, adding an additional methodological step to discuss the initial results with respondents could ground truth the findings and explore any uncertainties. Future studies could also analyse institutional sustainability policies and performance measurement frameworks to determine where they can be improved to potentially generate greater gains for fishery improvement and marine conservation. They could also be assessed against the GRI similarly to those analyses that have been done for other natural resource use sectors (WWF 2001) and in order to raise the standard overall.

The last objective was to propose how to overcome these obstacles to build a stronger sustainable seafood movement. These recommendations draw on the quantitative and qualitative study findings and reinforce my own experience of working for sustainable seafood.

Recommendations

5.1 To the Seafood Sector, including the Fishing Industry

1. Continue to invest in fisheries and address the obstacles to improvement.
2. Empower more of your staff to support sustainability initiatives, ensure succession and deepen your sectors' sustainability drive.
3. Embed accountability for improving fisheries and sustainable seafood in corporate performance measurement including through using the GRI.

5.2 To Government

4. Embed accountability for sustainable fishery outcomes in staff performance appraisal.
5. Support private sector training about EBM and sustainable seafood tools.
6. Work to ensure big picture strategies complement one another.

5.3 To NGOs

7. Constructively engage in multi-stakeholder initiatives and form teams to improve fisheries.
8. Critique sustainability efforts and develop solutions to address the challenges.
9. Work to ensure big picture strategies complement one another.

5.4 To Marine Conservation and Fisheries Scientists

10. Include stakeholders in your research.
11. Present ecosystem-based science creatively and target your messages to ensure the public messaging does not undermine fishery improvement.

5.5 To the Sustainable Seafood Movement

12. Deliver training about sustainable fisheries, especially EBM.
13. Develop transparent accountability frameworks for investing in improvement and for measuring change 'on the water'.

6 *Conclusions*

The study shows the presence of multi-sectoral momentum in implementing aspects of EBM. This informs the debate about the role of stakeholders in working towards more sustainable marine fisheries and thus seafood supplies and has practical applications in identifying obstacles to be addressed. Whilst the sustainable seafood movement has considerable momentum, this study shows two overall risks to this and opportunities for improvement include the need to deepen both the collaboration between actors and the use of accountability frameworks. Furthermore, the study identified that these gaps could be addressed by capitalising on the evident goodwill and resources of especially the private sector. Nearly two decades since the development of the CCRF and initiation of the MSC, clear mechanisms now exist for stakeholder engagement in especially developed country fisheries management however a greater focus is needed to more meaningfully engage the private sector actors who are investing and prepared to invest further in fishery improvement (Ward et al, 2002; Grieve 2007; McLeod 2009; MSC 2011, MRAG 2011). This could be done by establishing professionally resourced multi-stakeholder teams around particular fisheries to design, develop and deploy more creative solutions. These teams need to foster working relationships across diverse stakeholder cultures including grass root NGOs and corporate seafood executives. They must determine and deliver sustainability performance objectives that reconcile corporate goals and change 'in the water' such that these goals meaningfully deliver both effective fisheries management and marine conservation.

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8 Appendices

8.1 The Questionnaire

Perspectives and Attitudes towards Fisheries Management and Marine Conservation

Stakeholder questionnaire for a Masters Degree by Research

by Katherine Short, Imperial College London, Graduate School of Life Sciences and Medicine

May 2011

By Survey Monkey and Selected Phone Interviews

Interview #_____ Interviewee_____ Interviewee ID_____
Date_____ Time Started_____ Time Ended_____

Confidentiality

All information collected will be known to the researcher only. No individual will be identified in any report and any use of anonymised quotes or comments will be checked with the person beforehand.

Definitions: the following terms are used in this questionnaire and where not referenced, are as defined by the researcher.

Ecosystem-Based Management: *Management* of the uses and values of ecosystems in conjunction with *stakeholders* to ensure *ecological integrity* is maintained, and recognising that ecosystems are dynamic and inherently uncertain. *(Ward et al, 2002)*

Marine Conservation: is the protection and preservation of biodiversity, its web of ecosystems and their processes in oceans and seas. Marine conservation focuses on limiting human-caused damage to marine ecosystems, and on restoring damaged marine ecosystems.

Market Incentives: mechanisms for improving the sustainability of fisheries that involve giving economic benefits via the market for specific actions such as ecolabelling, preferred fishing practices etc.

Sustainable Fisheries: healthy fish populations, well-managed fisheries, mitigated impacts of fishing upon the ecosystem and associated and dependent species.

Please mark all boxes with an 'x'.

Part I. About the Respondent											
1. **Name (Optional)**											
2. **Organisation (Optional)**											
3. **What sector are you in?**											
Seafood processing &/or supply chain	❑	Fishing	❑	Research	❑	Government	❑	Non-government organisation	❑	Retail	❑
Other	❑	Please specify:									

4. **What is your position and/or title?**					
5. **How long have you been in this position?**					
6. **When were you born?**					
Pre 1940	❑	1941-1950	❑	1951-1960	❑
1961-1970	❑	1971-1980	❑	1981-1990	❑
7. **Gender**		**Male** ❑		**Female** ❑	
8. **What is your highest level of qualification?**					

School leavers qualification	❑	Undergraduate Degree	❑	Post graduate	❑	Vocational diploma or similar	❑	Other (please specify):

Part II. Knowledge of the Issues.				
Please use the following key for all responses in this section.				
4 = Very Aware - closely read and follow news, science articles and books about these issues; attend conferences; promote activities to address them in your sector and initiate discussions.				
3 = Quite Aware - read some news, science articles and books about these issues; occasionally attend conferences; engage in – but do not promote activities and discussions.				
2 = Somewhat Aware - read easy-to-access materials and listen to discussions.				
1 = Not Very Aware - only marginally engaged in reading or discussing these issues.				
9. How aware are you about marine conservation and fisheries sustainability issues?	1 ❑	2 ❑	3 ❑	4 ❑

10. What fishery sustainability or marine conservation *challenges* are you aware of?

		1	2	3	4
10.1	Overfishing	❑	❑	❑	❑
10.2	Bycatch and/or discards	❑	❑	❑	❑
10.3	Illegal, unregulated and unreported fishing	❑	❑	❑	❑
10.4	Bottom trawling	❑	❑	❑	❑
10.5	Carbon emissions associated with producing seafood (fishing, transport, refrigeration etc)	❑	❑	❑	❑
10.6	Habitat damage	❑	❑	❑	❑
10.7	Marine pollution (sewage, waste, plastics, lost gear)	❑	❑	❑	❑
10.8	Impacts of aquaculture e.g. escaped fish, spread of disease	❑	❑	❑	❑

11. What fishery and seafood sustainability or marine conservation *solutions* are you aware of?

		1	2	3	4
11.1	Marine protected areas, fisheries closures and other forms of zoning	❑	❑	❑	❑
11.2	Marine Stewardship Council certification	❑	❑	❑	❑
11.3	Sustainable seafood NGO campaigns	❑	❑	❑	❑
11.4	Fishery Improvement Projects	❑	❑	❑	❑
11.5	Specific policies that your organisation has on sustainable fisheries or sustainable seafood (NB. An opportunity to elaborate follows.)	❑	❑	❑	❑
11.6	Corporate social responsibility policies	❑	❑	❑	❑
11.7	Ecosystem approach to fisheries or ecosystem-based management of fisheries	❑	❑	❑	❑
11.8	FAO Code of Conduct for Responsible Fisheries	❑	❑	❑	❑
11.9	Government efforts to manage fisheries and / or reform fisheries management.	❑	❑	❑	❑

12. **From whom do you get your information about fishery sustainability or marine conservation?**

	Source	Always	Mostly	Sometimes	Don't know
12.1	Industry associations	❑	❑	❑	❑
12.2	Government	❑	❑	❑	❑
12.3	Conferences, seminars, sector working groups	❑	❑	❑	❑
12.4	Academia and/or other scientific groups	❑	❑	❑	❑
12.5	Conservation groups & other NGOs	❑	❑	❑	❑
12.6	The media	❑	❑	❑	❑
12.7	Seafood and fishing industry trade press	❑	❑	❑	❑
12.8	Other , please describe:				

Part III. Attitudes
This section characterises different attitudes people may have about the marine environment and humanity's use of it.

Please use the following Key for all your responses:
+2=Strongly Agree, +1 = Agree, 0=Neutral, -1=Disagree, -2=Strongly Disagree, DK=Don't Know

13. Your feelings towards the marine environment

		+2	+1	0	-1	-2	DK
13.1	I am ready to make personal sacrifices to help protect the marine environment.	❑	❑	❑	❑	❑	❑
13.2	I am ready to make professional sacrifices to help protect the marine environment.	❑	❑	❑	❑	❑	❑
13.3	I identify closely with the ocean and marine life.	❑	❑	❑	❑	❑	❑
13.4	I believe my personal and professional intervention will make a difference to protect the marine	❑	❑	❑	❑	❑	❑

	environment.						
13.5	The marine environment can regenerate itself without human intervention.	❑	❑	❑	❑	❑	❑
13.6	The marine environment is facing significant and permanent destruction.	❑	❑	❑	❑	❑	❑

14. Is there anything about the ocean and marine life that personally inspires you?

Yes/No? How? Please describe:

15. Are you able to use this inspiration in your work?

Yes/No? How? Please describe:

16.Perspectives on Action

		+2	+1	0	-1	-2	DK
16.1	I don't believe that there is a need for action to be taken to protect the marine environment.	❑	❑	❑	❑	❑	❑
16.2	I think my sector is doing too much/focusing too heavily on protecting the marine environment.	❑	❑	❑	❑	❑	❑
16.3	I work in a sector that could do a lot more to protect the marine environment.	❑	❑	❑	❑	❑	❑
16.4	I am frustrated by my organisation and/or sector's lack of action to protect the marine environment.	❑	❑	❑	❑	❑	❑
16.5	There are many actors across different sectors who are willing to work together to solve today's marine environmental challenges.	❑	❑	❑	❑	❑	❑
16.6	I don't think there is enough collaboration across sectors to bring about change.	❑	❑	❑	❑	❑	❑

17.Impacts of fishing

		+2	+1	0	-1	-2	DK
17.1	Up to this point, harm to marine ecosystems has been predominately caused by overfishing rather than by external factors such as pollution or climate change	❑	❑	❑	❑	❑	❑
17.2	When there is a conflict between damage to the marine environment and the need to fish and farm seafood, which of the following should take priority?						

17.21	We need to produce as much seafood from wild fisheries and aquaculture as we can, even if it causes some long term damage to the marine environment.	❑	❑	❑	❑	❑	❑
17.22	We need to limit fishing or fish farming so that harm to the marine environment is limited.	❑	❑	❑	❑	❑	❑
17.23	We can accept some limited damage to marine environment to produce seafood.	❑	❑	❑	❑	❑	❑

18.Achieving a sustainable supply of seafood requires one of the following:

18.1	Conserving natural marine ecosystems	❑
18.2	Developing more sustainable fisheries	❑
18.3	Conserving natural marine ecosystems and developing more sustainable fisheries	❑
18.4	No change because the marine environment will regenerate itself without human intervention.	❑

19.How important do you think each of the following is?

Answer using the scale 1=very important; 2=somewhat important; 3=not very important and 4=not at all important.

		1	2	3	4	DK
19.1	Declaring and protecting special marine areas.	❑	❑	❑	❑	❑
19.2	Increasing the scope and scale of aquaculture.	❑	❑	❑	❑	❑
19.3	Ongoing commercial use of wild fisheries.	❑	❑	❑	❑	❑
19.4	Balancing commercial fishing and marine protection.	❑	❑	❑	❑	❑

20. Which statement best reflects your own view about the role of aquaculture?

		+2	+1	0	-1	-2	DK
20.1	Increasing aquaculture production is needed for food security.	❑	❑	❑	❑	❑	❑
20.2	Aquaculture can relieve pressure on wild fisheries.	❑	❑	❑	❑	❑	❑
20.3	Increasing aquaculture will only relieve pressure on wild fisheries if alternative (non-wild fish) feed sources are found.	❑	❑	❑	❑	❑	❑
20.4	The aquaculture sector needs to invest in technological advancements to address the impacts of aquaculture operations.	❑	❑	❑	❑	❑	❑
20.5	There are cost-effective opportunities to move towards cleaner, less impactful aquaculture operations.	❑	❑	❑	❑	❑	❑
20.6	Best practice standards are needed to address the impacts on the marine environment.	❑	❑	❑	❑	❑	❑
20.7	The use of marine space needs to be better managed to reduce conflict amongst different users.	❑	❑	❑	❑	❑	❑
20.8	The aquaculture sector is doing enough to improve its environmental performance.	❑	❑	❑	❑	❑	❑
20.9	The aquaculture sector needs to do more to improve its environmental performance.	❑	❑	❑	❑	❑	❑
20.10	Please add any further comments:						

Part IV. Implementation

21. How responsible are each of the following for improving fishery and aquaculture practices? (+2 = High Responsibility,-2 = Low Responsibility)

		+2	+1	0	-1	-2	DK
21.1	Individuals within their (relevant fisheries/seafood sector) institution.	❑	❑	❑	❑	❑	❑
21.2	Government regulators.	❑	❑	❑	❑	❑	❑
21.3	The resource user, fisherman or fish farmer.	❑	❑	❑	❑	❑	❑
21.4	The fisher or fish farmer's organisation.	❑	❑	❑	❑	❑	❑
21.5	Local fishing or farming communities.	❑	❑	❑	❑	❑	❑
21.6	The general public that eats fish.	❑	❑	❑	❑	❑	❑
21.7	The seafood supply chain (e.g. processors, distributors, suppliers and retailers.)	❑	❑	❑	❑	❑	❑
21.8	Conservation organisations.	❑	❑	❑	❑	❑	❑
21.9	Fisheries, marine and conservation scientists.	❑	❑	❑	❑	❑	❑
21.10	Chefs	❑	❑	❑	❑	❑	❑

22.The position of your organisation on these issues:

22.1	Does your organisation have an official or formal policy (objectives, and/or policy statements, and/or, vision, and/or, goals, and/or etc) about marine conservation, fisheries sustainability, an ecosystem-based approach or seafood sustainability?	Y❑	N❑	DK❑
22.2	If yes, in what year was it adopted?			
22.3	Why was this official or formal policy produced?			
22.4	If your organisation doesn't have official or formal policy, is one being developed?	Y❑	N❑	DK❑
22.5	What department has responsibility for developing such a policy?			
22.6	If there is one, it is being implemented?	Y❑	N❑	DK❑
22.7	If not, what are the key obstacles to its implementation?			
22.8	Are Key Performance Indicators relating to fisheries or seafood sustainability used in your organisation?	Y❑	N❑	DK❑
22.9	Is your own performance measured in relation to delivering on any of the fisheries or seafood sustainability aspects of your organisational policy?	Y❑	N❑	DK❑

23. How do the following phrases fit the focus of your organisational policy?

	+ 2 = Very Good Fit, - 2 = Very Poor Fit	Score					
		+2	+1	0	-1	-2	DK
23.1	Conservation of marine ecosystems, the physical environment and nature. (A 'natural' perspective)	❑	❑	❑	❑	❑	❑

23.2	Conservation of marine resources. (A 'utilitarian' perspective).	❑	❑	❑	❑	❑	❑
23.3	Sustainability of the use of marine resources. (Maximum take within ecosystem limits.)	❑	❑	❑	❑	❑	❑
23.4	Maximising profit while minimising environmental harm.	❑	❑	❑	❑	❑	❑
23.5	Balancing environmental benefits and economic gain.	❑	❑	❑	❑	❑	❑
23.6	Other (please elaborate):						

24.What level of results in the following categories is your organisation delivering?
Key: +2 = High Results, -2 = Poor Results

		+2	+1	0	-1	-2	DK
24.1	Conservation of marine ecosystems and the marine environment.	❑	❑	❑	❑	❑	❑
24.2	Conservation of marine resources and nature.	❑	❑	❑	❑	❑	❑
24.3	Sustainability of the use and management of marine resources.	❑	❑	❑	❑	❑	❑
24.4	Sustaining seafood supplies.	❑	❑	❑	❑	❑	❑
24.5	Securing our business's resource base.	❑	❑	❑	❑	❑	❑
24.6	Balancing environmental benefits and economic gain.	❑	❑	❑	❑	❑	❑
24.7	Maximising profit while minimising environmental harm.	❑	❑	❑	❑	❑	❑
24.8	Improving the data, science and information base upon which to manage fisheries.	❑	❑	❑	❑	❑	❑
24.9	Improving fisheries management regulation and policy.	❑	❑	❑	❑	❑	❑
24.10	Other (please state)						

25. What resources does your organisation provide to address these issues?
Key: +2 = readily accessible, +1 = accessible, 0 = neutral, -1= there is a deficit of this, -2=there is a strong deficit of this.

		+2	+1	0	-1	-2	DK
25.1	Leadership.	❑	❑	❑	❑	❑	❑
25.2	Resources are allocated, specifically:						
25.21	• Personnel	❑	❑	❑	❑	❑	❑
25.22	• Time.	❑	❑	❑	❑	❑	❑
25.23	• Money.	❑	❑	❑	❑	❑	❑
25.24	• Expertise.	❑	❑	❑	❑	❑	❑
25.25	• Communications – internal and external	❑	❑	❑	❑	❑	❑
25.3	Information is available, specifically:						
25.31	• Online research/purchased references.	❑	❑	❑	❑	❑	❑
25.32	• Conferences.	❑	❑	❑	❑	❑	❑
25.33	• Information systems developed internally/with partners.	❑	❑	❑	❑	❑	❑
25.34	• Training.	❑	❑	❑	❑	❑	❑
25.4	Effective planning.	❑	❑	❑	❑	❑	❑
25.5	Good implementation of organisational plans.	❑	❑	❑	❑	❑	❑

25.6	We use partnerships with conservation organisations.	❑	❑	❑	❑	❑	❑
25.7	We identify and address key issues effectively.	❑	❑	❑	❑	❑	❑
25.8	Other, please explain and/or elaborate on any of the above:						

26. If results are not being achieved, please give further details to describe why not?

27.If you could, what would you do to achieve better results, or results with greater impact?

		+2	+1	0	-1	-2	DK
27.1	Reward leadership.	❑	❑	❑	❑	❑	❑
27.2	Allocate more financial resources to:						
27.21	• Dedicate personnel.	❑	❑	❑	❑	❑	❑
27.22	• Use expert advisors.	❑	❑	❑	❑	❑	❑
27.3	Improve access to:						
27.31	• Trade associations working groups	❑	❑	❑	❑	❑	❑
27.32	• Conferences.	❑	❑	❑	❑	❑	❑
27.33	• Conservation organisation or other partners.	❑	❑	❑	❑	❑	❑
27.34	• Establish and deliver training.	❑	❑	❑	❑	❑	❑
27.35	If training would enable better results, please describe what type of training?						
27.4	Improve accountability and performance measurement. for sustainability.	❑	❑	❑	❑	❑	❑
27.5	Other, please explain and/or elaborate on any of the above:						

28. Opportunities for Further Improvement. Please state one priority that would help you to make the most difference.

Part V. Wrap Up

29. Please provide any other comments about the subjects raised in this questionnaire. What has not been covered that you think is an obstacle or opportunity that needs to be addressed. Please make any recommendations.

30. Do you wish to remain anonymous?	Y❑	N❑
31. Are you willing to have your views published once the researcher has checked the wording of any text to be published with you?	Y❑	N❑
32. Would you like a copy of the final paper(s) that are published?	Y❑	N❑

Thank you for your time, effort and interest in completing this survey.

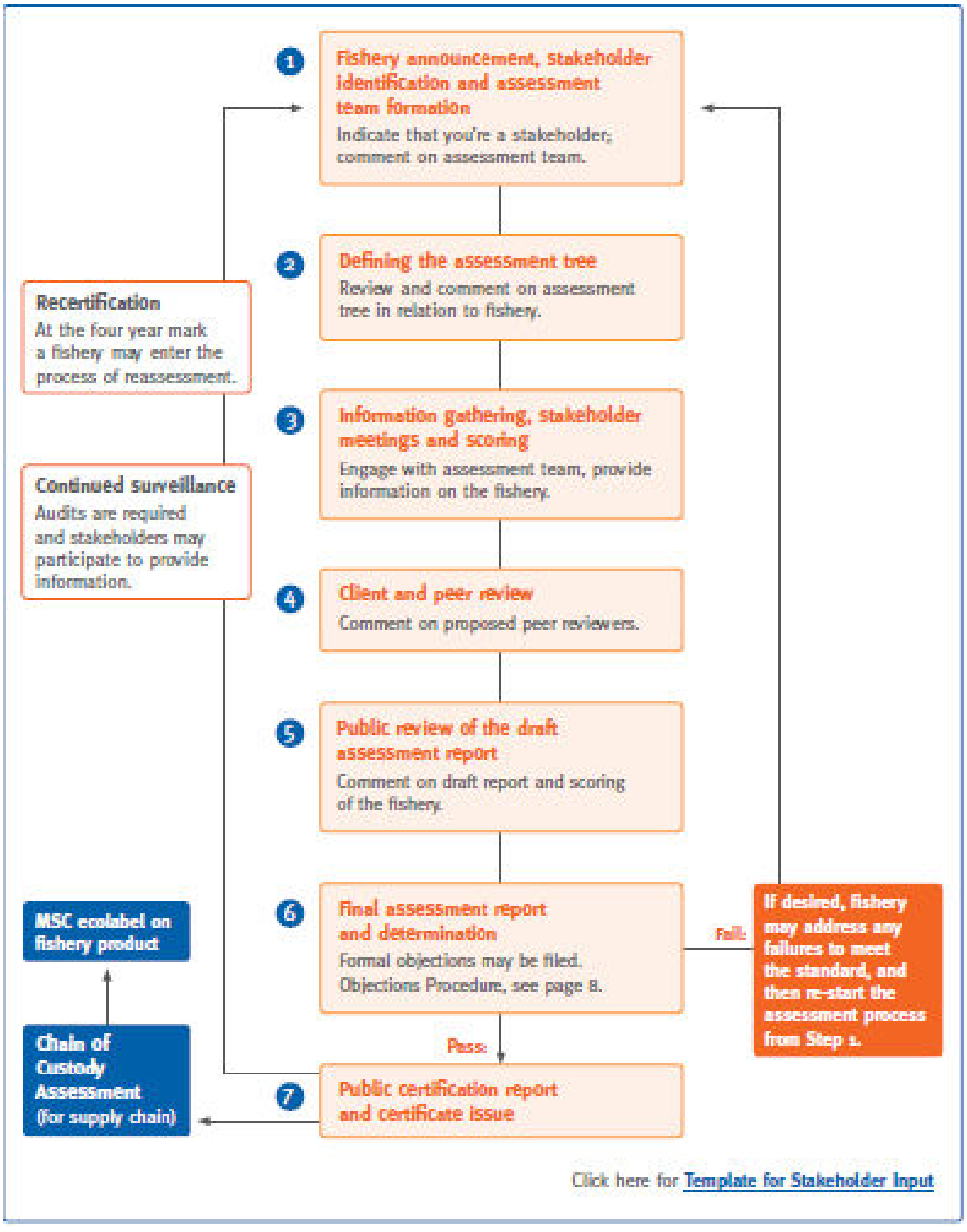
8.2 Key Informants

#	Name			Organisation	Respondent	Title
1		Jim	Gilmore	At-sea Processors Association	1	Director of Public Affairs
2	Dr	Cathy	Roheim	Department of Environmental and Natural Resource Economics, University of Rhode Island	1	Professor & Director Sustainable Seafood Initiative
3		Mike	DeCesare	Marine Stewardship Council	1	Communications Director, Americas Region
4		Jennifer	Scott	Ogilvy PR Worldwide	0	Managing Director
5		Meredith	Lopuch	World Wildlife Fund	0	Director - Major Buyer Initiative, Fisheries
6	Dr	Dierk	Peters	World Wildlife Fund	0	Director, Sustainable Seafood Initiative
7	Dr	Meryl	Williams	AsiaPacific-FishWatch	1	Panel Member and Vice Chair
8	Dr	Ellen	Pikitch	Institute for Ocean Conservation Science	0	Executive Director
9	Dr	Robert	Rangeley	WWF-Canada	0	Vice President, Atlantic
10		Duncan	Leadbitter	Fish Matter Pty Ltd	1	Director
11		Lucy	Pelham-Burn	New England Seafood International Limited	1	Head of Corporate Social Responsibility
12		Matt	Elliott	California Environment Associates	1	Principal
13		Mike	Sutton	Center for the Future of the Oceans Monterey Bay Aquarium	0	Vice President & Director
14		Arthur	Hanson		0	Independent Consultant
15		Julie	Packard	Monterey Bay Aquarium	0	Executive Director
16		Scott	Burns	Walton Family Foundation	0	Environment Focus Program Director
17	Dr	Andrew	Rosenberg	Conservation International	0	Senior Vice President for Science + Knowledge
18		Brad	Ack	Marine Stewardship Council	0	Director, North America's
19		Jerry	Knecht	North Atlantic, Inc.	0	President
20		Heike	Vesper	WWF Germany	0	Director Marine Programme
21		Henk	Brus	Pacifical cv	1	Managing Director
22	Dr	Rebecca	Goldburg	The Pew Environment Group	1	Director, Ocean Science Division
23		John	Goodlad	Scottish Pelagic Sustainability Group	0	Chairman
24	Dr	Villy	Christensen	University of British Columbia Fisheries Centre	0	Professor
25		Heather	Tausig	New England Aquarium	0	Associate Vice-President of

						Conservation
26	Dr	Heather	Koldewey	Zoological Society of London	1	Conservation Programme Manager
27		Rebecca	Bird	WWF New Zealand	0	Marine Head
28		Bob	Zuur	WWF New Zealand	0	Marine Advocate
29	Dr	Patricia	Majluf	Centro para la Sostenibilidad Ambiental, Cayetano Heredia University	1	Professor
30	Dr	Esther	Luiten	Dutch Sustainable Trade Initiative	1	Senior Programme Manager
31	Dr	Bettina	Saier	WWF Canada	0	Director Oceans
32		Eric	Bernard	OSO, R&O Seafood Gastronomy	0	Quality and Sustainability Director
33	Dr	Bill	Fox	World Wildlife Fund	0	Vice President, Fisheries
34		Thomas	Kraft	Norpac Fisheries Export	1	Managing Member
35		Peter	Redmayne	Sea Fare Group	1	Director
36		Julia	Roberson	The Pew Environment Group	0	Program Manager, Global Tuna Conservation Campaign
37		Howard	Johnson	Sustainable Fisheries Partnership	1	Director of Global Programs
38		Cheryl	Dahle	Future of Fish	1	Founder
39		Kristian	Teleki	SeaWeb	0	Science Manager
40		Ted	van der Put	Dutch Sustainable Trade Initiative	0	Program Director
41		Nigel	Edwards	Seachill	1	Technical Director
42		Simon	Rilatt	Trident Seafoods	0	Sustainability Director
43		John	Fiorillo	IntraFish Media	1	Executive Editor
44		Nadia	Bouffard	Fisheries and Oceans Canada	0	Director General, Fisheries and Aboriginal Policy
45		Charlotte	Cawthorne	The Prince's Charities' International Sustainability Unit	1	Marine Programme Manager
46		George	Clement	Clement and Associates	0	Principal
47		Mike	Crispino	International Seafood Sustainability Foundation	0	Communications Director
48		Linda	Chaves	NOAA Fisheries	1	Senior Adviser, Seafood Industry Issues
49		Melanie	Siggs	Seafood Choices Alliance	0	Executive Director
50		Dawn	Martin	SeaWeb	0	President
51		Joy	Anderson	Criterion Associates	0	Principal
52		Lisa	Monzon	Packard Foundation	1	Programme Officer
53	Dr	Victor	Restrepo	International Seafood Sustainability Foundation	1	Chair, Scientific Advisory Committee
54		Nicole	Hunter	Icelandic Group UK Ltd - Coldwater Division	1	Senior Buyer
55	Dr	David	Agnew	MRAG	0	Principal Fisheries Scientist

56		Rupert	Howes	Marine Stewardship Council	0	Chief Executive Officer
57		Dominic	Collins	Coldwater Seafoods	0	Head of Buying
58		Lisa	Dropkin	Edge Research	0	Principal
59		Amanda	Stern-Pirlot	Marine Stewardship Council	1	Policy Development Director
60		Dan	Hoggarth	Marine Stewardship Council	1	Senior Fisheries Assessment Manager
61		Chris	Ninnes	Marine Stewardship Council	1	Deputy Chief Executive Officer
62		Yemi	Oloruntuyi	Marine Stewardship Council	1	Programme manager -Developing world fisheries
63		Margaret	Moore	WWF Australia	1	Policy Officer - Retired
64	Dr	Bill	Lart	Sea Fish Industry Authority	1	Sustainability and Data
65		Wez	Norris	Forum Fisheries Agency	1	Diector, Fisheries Management
66		Kristian	Parker	Oak Foundation	1	Board Chair
67	Dr	Dirk	Zeller	University of British Columbia Fisheries Centre	1	Senior Research Fellow & Project Manager
68		Martin	Brugman	Culimer B.V.	1	Managing Director
69		William	Davies	Seachill	1	Technical Manager
70	Dr	William	Cheung	University of East Anglia	1	Lecturer in Marine Ecosystem Services
71		Patrice	Robert	Thon des Mascareignes	1	General Manager
72		Adolfo	Valsechi	MW Brands	1	Owner, Managing Director
73		Paul	Reenan	John West	1	Managing Director

8.3 MSC Stakeholder Process



8.4 Levels of Awareness of the Challenges

	Fishing	Government	NGO	Other	Research	Retail & Processing
Overall Awareness	3.6	4.0	3.8	3.9	3.8	3.5
Overfishing	3.6	4.0	3.8	3.9	3.8	3.5
Bycatch and/or discards	3.6	4.0	3.8	4.0	3.8	3.8
IUU Fishing	3.6	3.9	3.8	3.8	3.7	3.8
Bottom trawling	3.3	3.7	3.6	3.6	3.7	3.6
Carbon emissions	3.6	4.0	3.6	3.7	3.4	3.1
Habitat damage	2.7	3.1	2.9	2.8	3.1	3.0
Marine pollution	3.2	3.8	3.6	3.6	3.4	3.2
Impacts of aquaculture	2.9	3.4	3.1	3.0	3.1	2.9
Total	26.3	29.9	28.3	28.5	28.1	27.0

8.5 Levels of Awareness of the Solutions

	Fishing	Government	NGO	Other	Research	Retail & Processing
MPAs	3.6	3.9	3.8	3.7	3.7	3.4
MSC	3.4	3.8	3.9	3.8	3.8	3.9
NGO	3.0	3.8	3.9	3.4	3.7	3.7
FIPs	2.7	3.2	3.6	3.2	3.3	3.4
Sustainability policies	3.4	3.6	3.8	3.4	3.1	3.8
CSR	2.7	3.2	3.3	3.0	3.2	3.5
EAF / EBM / EBFM	3.4	3.8	3.6	3.3	3.6	3.2
FAO CCRF	2.9	3.4	3.4	3.3	3.5	3.1
Government Regulation	3.6	3.9	3.5	3.5	3.4	3.5
Total	28.7	32.6	32.7	30.6	31.3	31.4

8.6 Positive responses to Question 13. Your feelings towards the marine environment

Score >0	Fishing	Government	NGO	Other	Research	Retail & Processing	Sum	%
Personal sacrifices	7	10	31	29	18	19	114	90
Professional sacrifices	6	10	30	27	12	20	105	83
Identify closely	9	11	31	25	15	22	113	89
I believe my intervention make a difference	6	11	33	30	16	19	115	91

Marine environment can regenerate	4	3	7	8	5	1	28	22
Facing significant and permanent destruction.	1	6	24	19	12	10	72	57

8.7 Geographic Origin of Respondents

Region	Countries	#	Total	%
Oceania	Australia	14	24	19
	Fiji	1		
	New Caledonia	2		
	New Zealand	6		
	Solomons	1		
Europe	Belgium	2	40	31
	UK	22		
	France	4		
	Germany	2		
	Italy	3		
	Netherlands	3		
	Scotland	1		
	Spain	1		
	Switzerland	2		
Scandinavia	Norway	3	3	2
South America	Argentina	1	2	2
	Peru	1		
Caribbean	Jamaica	1	1	1
North America	Canada	13	50	39
	USA	37		
Africa/WIO	Mauritius	1	2	2
	Seychelles	1		
Asia	China	2	5	4
	Malaysia	2		
	Philippines	1		
	n =	127	127	

8.8 Level of Results

Q. 24. What level of results in the following categories is your organisation delivering?
+2 = High Results, -2 = Poor Results

		24.1 Conservation of marine ecosystems and the marine environment	24.2 Conservation of marine resources and nature	24.3 Sustainability of the use and management of marine resources	24.4 Sustaining seafood supplies.	24.5 Securing our business's resource base.	24.6 Balancing environmental benefits and economic gain	24.7 Maximising profit while minimising environmental harm	24.8 Improving the data, science and information base upon which to manage fisheries	24.9 Improving fisheries management regulation and policy
= 2 High Results	Fishing	2	3	5	4	5	4	3	5	6
	Government	2	2	3	2	1	0	0	1	3
	Non-Government	11	8	12	12	4	6	2	14	13
	Other	4	5	7	5	1	0	1	9	9
	Research	4	3	6	2	0	2	0	9	5
	Retail & Processing	1	1	5	7	3	4	1	5	3
	Total	24	22	38	32	14	16	7	43	39
+ve Results = >0	Fishing	6	8	9	4	5	5	6	8	7
	Government	6	4	8	3	3	7	2	7	8
	Non-Government	26	24	25	19	10	18	7	22	26
	Other	16	16	22	21	8	16	12	21	23
	Research	10	9	12	7	4	10	4	16	14
	Retail & Processing	11	13	15	17	17	15	7	16	14
	Total	75	74	91	71	47	71	38	90	92
-ve Results =<0	Fishing	1	1	0	1	1	0	1	0	1
	Government	0	1	1	0	2	1	3	2	1
	Non-Government	0	0	1	3	4	3	6	0	0
	Other	1	1	1	1	4	4	4	1	2
	Research	0	0	0	0	1	0	1	0	0
	Retail & Processing	2	1	0	0	0	2	3	1	1
	Total	4	4	3	5	12	10	18	4	5

8.9 Training

Below are responses to being asked if training would enable better results and to describe what type of training and/or elaborate on issues related to achieving better results.

Government

- Training/informing NGO's of the real situation related to aquaculture rather than what is perpetuated in the popular press would be productive for everyone. There are of course issues that need to be addressed. However, when NGO's focus on reporting in an unbalanced way - it takes resources away from making progress on the real issues.
- Use expert advice.
- What is implied by ecosystem approaches and what is needed in an incremental approach.
- Addressing uncertainty in decisions.
- Fisheries management; aquaculture science.

NGOs

- We are initiating "Seabird Smart" Fishermen's Training training to inform managers of sustainability and accountability.
- Sustainable business; environmental services payments, training in the MSC scheme, requirements etc, for certification bodies, auditors, peer reviewers etc.
- We train our retailer partners' seafood staff but all organizations with business partners should do this, if they don't currently.
- Training for example on the MSc standard as sustainability codified.
- Leadership training throughout organisation, creative thinking.
- Economic performance.

Other

- First we need to establish products that are traceable with regards to the chain of custody then training would help our staff identify the features and benefits.
- Training for fishers and supply chain decision makers on the difference they can make with their actions and the reasons those actions are beneficial to all.
- Greatly increase Fishery Improvement Programs to deliver practical support for changed practices.
- Economics and (human) management.

Research

- Data integration with government sectors
- GMRI runs the Marine Resources Education Program for marine stakeholders.
- Training for stakeholder groups in fishery management, stock assessment, and fishing technology.
- Training should be both academic & experientially based.
- Provide managers and stakeholders with a greater appreciation of how complex systems work so make less decisions that have unintended consequences.
- Training in fisheries management to decision makers.
- Training on how to manage natural resources and address specific problems based on geographical location.

Retail

- The entire chain must be educated to include supply chain.

Processing

- We are always looking for better fishing practices to reduce non targeted species interaction
- Training commercial and technical staff in the issues that affect their supply chains
- Generally raising the level of the game; towards greater understanding of economic benefits of promoted sustainable fisheries.
- In fisheries, awareness-raising, driving the message home at every level to try to effect positive change.

- New methods for fishermen, how to transfer data required to the scientific community and RFMOs to create a solid and reliable data base to inform be able to make the right decisions and plans.
- Training of fishermen in better (more responsibly sound) fishing practices.
- Of business teams and captains fishing practices, processing, aquaculture etc technical, scientific training.

8.10 Final Comments

Opportunities for Further Improvement. Please state <u>one priority</u> that would help you to make the most difference. (Names have been xxx)

Fishing

- All management decisions are based on science therefore the database needs a lot of money spent on updating. Our fishery is managed under "owner/operator" policy these guys are the most conservative type of fisher you can get. Better information on shared resources between stakeholders would take a lot of the "politics" out of sustainable decision making.
- Marine fishing is currently an economically marginal activity in Australia (profit wise) the questions above tend to presume resources are not a limiting factor.
- Closer linkages with moderate conservation groups to counter-act the false information and unreal expectations of the radical organisations.
- The opportunities come from communicating the wins. The broader population are not hearing about the good stuff that is happening in fisheries.
- Acceptance by major eNGO's that work is being done by and within the Commercial Industry
- Keep training and informing the crews and fishermen.

Government

- Because I am trained in Fish Nutrition, in my new role in government, being able to allocate resources to making aquafeeds more sustainable will make the most difference.
- For conservation organizations to focus on real (vs perceived) issues and be willing to work toward solutions.
- Smaller hierarchy within the administration.
- Greater available funding.
- Concrete and measurable objectives that force confronting tradeoffs.
- More money and even stronger pressure political pressure/emphasis on sustainability.
- Secure independent scientific advice - this is a matter of funding and quality control at national and regional level.
- Bring together diverse communities for win-win ideas that make progress more politically feasible.
- An apolitical agenda for fisheries management
- More technical and analytical staff.

NGO

- Better funding for improving fisheries in developing countries.
- Being able to generate more ratings on seafood.
- Reform of the MSC FAM and certification process.
- More funds! More collaboration with like-minded groups internationally.
- Create a top notch think tank (for free) where governments could seek advice and be advised on what to and how to do it (e.g. access to funds to support their needs.
- If the environmental NGO community and foundations could come together to achieve a common vision and to embrace partnerships with fishers, fishers would be better able to focus resources on the most relevant and important issues.
- Better sticking to the strategic plan and longer view--less reactivity.
- Lack of time and other resources to adequately address some issues.

- Empowered NGOs to trigger changes in decision makers.
- Dedication of personnel.
- Greater capacity.
- A better understanding of the Asian seafood supply chain, the key actors in this region and intervention points.
- Increased Funding.
- More time.
- Knowledge about factors of importance, and to make actions thereafter (Things should be done because it helps, not because some politicans or NGOs or experts or "users of the sea" are saying so.)
- Better data on fisheries, globally.
- Achieving a higher degree of acceptance of ecolabels in the USA.
- Additional experienced personnel.
- Tracking improvements over fisheries, linking "seafood" to other marine conservation issues
- Better aligning stakeholders around a common vision.
- Support of development agencies to fisheries sustainability in developing countries.
- Better communications tools to bring the real issues of fisheries to life and inspire change!
- Cross sector communication.

Other

- Not relevant to us but in general build awareness and capacity
- Additional financial resources. Cross organisational work on ocean governance and management issues.
- Better collaboration with private industry.
- Link marine conservation policies to macroeconomic policy – i.e. manage resources to provide economic benefits rather than be a social welfare / pollution sink.
- More funding.
- Joint strategizing with industry, funders and NGOs.
- To clearly articulate to Ministers of Finance - and not Ministry of Fisheries - the increased economic benefits for long-term licensing and equally show the economic damage of depleted stocks. Scientists should also learn how the industry really works and be prepared to listen as well. Most development countries are only swayed on economic reasons.
- Bring more diverse interests to the table to agree on common goals, frameworks, and metrics.
- Identification of a sustainable fishing & distribution model where there is undisputable evidence of economic and environmental benefit. Without a sound business plan environmentally sustainable initiatives are doomed to fail. Our food service company has made substantial contribution to an NGO and it is committed to a variety of environmentally sound business practices. I am confident our food service company would support sustainable seafood programs if they can be shown it is the right thing to do.
- Establish a database of fisheries performance indicator assessments across a wide range of fisheries over time. Use it to evaluate the biological, economic, and social sustainability of fisheries, and thus indicate the relative successes of various fishery management approaches.
- Ensuring that folks get serious about developing world fisheries.
- I think better education of fishermen and their representatives.
- To convince high level politicians two keys: policy based on good science + CONTROL
- I need staff! FFA is experiencing significant difficulties attracting and retaining highly experienced staff.
- Greater resources to help fisheries willing to make environmental improvements make them.
- Better coordination and cooperation between fisheries, environment and other departments of government relevant to marine management. At present, in many countries, the fisheries department is isolated and operates in a different world to that of the environment action.

- For ocean and coastal management broadly the most useful improvement would be strong mechanisms to address conservation and use at a regional ecosystem level, to have sustainability and acceptable impact benchmarks established at the level, and to be able to manage conservation and use sectors to deliver those regional outcomes.
- Fishing organization trainings & empowerment.
- Extra-budgetary funds.
- Forming more productive relationships with conservation organisations.
- As stated above, encouraging / educating buyers about what the real costs are production are key.
- Stronger partners.
- Working with a broader range of partners. More time.
- More technical projects on responsible fishing practices.

Research

- Eliminate doomsday media campaigns, and stop funding researchers that only produce diagnostics, and inventories of problems without ever producing practical solutions.
- Better application of scientific principles and less mindless support of dramatic dogma.
- Funding (unfortunately).
- Easier access to partnership funding.
- Improve communications between all stakeholders.
- Growth in the number of researchers engaged with seafood sustainability research.
- More funding resources, improved internal media resources.
- Broadening responsibility and accountability of all stakeholders in the fisheries/marine environment management sector and for all users of marine resources.
- education
- Better, more accountable, governance in international organizations such as RFMOs. They need to stop being forums for the lowest common denominator.
- Establish and deliver training.
- Getting stakeholders of all kinds to play systems games together so they can see system dynamics in action and come to appreciate why other people have the views they do. With that kind of understanding systems decisions are made more effectively.
- Better interaction between the science community and the fishing industry.
- Not relevant to organisation.
- More industry and government and conservation groups interaction to solve the problem.

Retail

- The supply chain MUST be improved.
- More time for only this topic.

Processing

- Develop our traceability system for broader use within the industry.
- Believe it or not, just some administrative support. I get bogged down with basic admin.
- Industry rents right to fish, rent raised in part go to better research, comprehensive management at appropriate scale (i.e far smaller scale for inshore fisheries) and 'barefoot ecologists' (do literature search, think the paper was in Fish and Fisheries about 10 years ago) ie ADAS (MAFF era agricultural advisors) to help fishers do better fishing - more profitable less environmental impact, all leading to far greater appreciation in UK of this fabulous natural asset that we have.
- Training.
- Improve data flow, track & trace information.
- Create and even stronger focus and training to central procurement team.
- Co-operation between individual producers and fishermen with NGOs- no more broad-strokes statements - instead focus on a “prove it to me” individual basis.

- CHANGE RFMO constitutions. Their existing remits, membership, organisational hierarchy and decision making don't work or we would not be looking at depleted world fisheries. To me the Managers, the RFMOs, should be HELD responsible to produce genuinely sustainable, resilient fisheries and ocean use - who else will, if they don't?
- Better training and communication of the facts and relevant information.
- A consistent national message that can be broadcast simply, accurately and consistently.
- Transparent cooperation between stakeholders.
- More time!
- Getting our tuna fisheries MSC approved.
- Have the NGO's and our customers invest in Fisheries Improvement Plans and projects rather than spend their efforts on choosing the already good fisheries and criticizing those that don't meet their standards. We need to recognize fisheries that are making progress toward sustainability and keep sourcing from them in order to continue making the needed improvements.
- Demand that all country governments adopt and enforce sustainability principles and policy that would guarantee best fishing and aquaculture practices.
- Clarity of data.
- Time, people, money.

Q. 29. Please provide any other comments about the subjects raised in this questionnaire. What has not been covered that you think is an obstacle or opportunity that needs to be addressed. Please make any recommendations.

Fishing

- Don't expect to change people's views on sustainability overnight. Frankly, forget this current generation and work on the young ones at school & university. This planet is overrun by the "economic rationalists" (greed) so corporatized fisheries are doomed in the long run at the expense of depleting our ocean resources!! My views are just a drop in the ocean however, there is one aspect I have observed in the last 30 yrs or so..... give the fish what they want and they will multiply for free at no cost to society. However, humans just pour so much crap into our oceans without understanding the impacts on all marine life.
- None.
- Ecosystem science is, in my view, at a very early stage of development. Trying to set up management systems using it as a base is fraught with difficulties. By way of analogy, enthusiasts for it are like inventors proving a process in a lab; it is a long way then to a pilot plant and then full scale production. We are at the phase of where some of the concepts/research do warrant moving to pilot programs, but far away from the level of certainty as to development and application that warrant full scale deployment. Regrettably the enthusiasm of the 'inventors' is running way ahead of the hard effort still to be done in application. Without more attention to management and application the result might end up being similar to integrated coastal zone management, where it is widely agreed it is a good idea, but it is not really implemented.
- Hi Katherine Hope this is useful, we need you down here to promote sound collaboration between between industry and the moderate conservation groups Regards xxx
- I will be interested to see the results.

- Not sure.
- Not really sure that the questions relate totally to my views on this issue.
- Firstly, give people the information, prepare the ground. Then the information will end up being useful for training etc. releasing sharks alive. When we put in place our fishing policy, how should we properly handle the sharks? We asked the scientists. May harm yourself and the fish. Not just release them alive but minimise stress. We got instructions and did training with them. 3 different ways of how to handle the shark. Turtles also. If there's injury etc.

Government

- Good luck with your research. - If through your research you could stress the need to and contribute to moving toward establishment of International Standards for the KPI's for sustainable aquaculture that would be a positive development.
- Government should start listening to experts instead of their own woolly definitions of experts. This will lead to less paper pushing.
- Such questionnaires are difficult to answer properly because your perceptions when formulating the questions are not necessarily obvious and clear to the respondents. One dimension which is missing is that to me the development of an EAM has been and continue to be a gradual process, full of small improvements step by step as the scientific knowledge and evidence is there and the political maturity/pressure is strong enough. Political change also has a strong tendency to occur as a result of crisis; change does not come before it is obvious and necessary.
- I have accepted to participate in this survey but I am not certain its design is quite correct, I can see certain biases. The most essential basis for improvements is to deal with fishery like any other economic activity, deal with fishermen the same way we deal with farmers and miners, regulate their impacts on nature, and recognise the need for better prioritisation in national agendas. As it is today, fisheries is a priority nowhere in the world except in Iceland (and even there, it comes far after the banking crisis). It is not possible to pretend serious improvements like this.
- It is very important area the fragmentation of debate across organizations (forum hopping) with different clientele, the diversity of approaches in isolation of mutual needs etc has confused the debates and solutions beyond what is feasible. There has been a retreat in our own organization from allowing people to work with even reasonable ENGOs because of backlash and optics from extremist views. Similarly fear among industry prevents progress as well finally these issues are now becoming geopolitical with the attempt to 'package' together unrelated issues is a killer to the agenda. Witness the packaging together of biodiversity outside 200 miles with insistence of g-77 on "common heritage of mankind issues' as a trade-off is a killer. We need some reasoned middle of the road literate and win-win debate and PRACTICAL solutions to bridge, not divide. The politicization of the debates on oceans is going to kill progress.
- The phrasing of some of the questions makes assumptions that I disagree with resulting in responses that don't reflect my true opinion. I'd be more than happy to discuss this with you.

Non-Government

- I'm not sure this is helpful or constructive but it's very apparent that the growth in consumer demand in rapidly developing countries is going to overwhelm the efforts of more conservation-minded corporations in the US and EU very quickly and this needs to be considered. I would also

have expected to see some reference to governance of fisheries on the high seas which is a hugely important issue.

- One obstacle is that the discussion around sustainable fisheries is currently lopsided, and I thought that was reflected here.
- Sorry to go on about this Katherine - but could have done with a bit of road testing before putting this questionnaire out. Quite a few questions forced answers (otherwise the questionnaire would not proceed) when they were clearly not appropriate. This makes the whole questionnaire frustrating and could lead to respondents giving up after putting quite a bit of effort into it. Also your time estimate was out by a factor of 3. Nevertheless good luck with it all. Cheers xxxx
- I think the accountability of managers responsible to make these decisions should be there. A scorecard on the performance of government officials with respect to the different shortcomings would be a good way to impose better performance.
- I don't think this is a very meaningful questionnaire for someone in the Ocean conservation sector.
- Would be great if conservation organizations could understand and work within their common overarching objectives, recognize that their differences present opportunities, and not compete with or try to undermine each other. Achieving sustainable use of marine resources and maintaining biodiversity are huge, huge jobs, worked on over long timescales. Therefore there really aren't resources to spare on in-fighting and battles in the media, etc. Just need to get on with it already.
- We have to take in account local conditions against global markets and trends
- Perhaps a section about opportunities for organisations to work together to tackle some of these issues.
- Labelling, closing the loop of the supply chain and traceability of seafood
- Construction of the survey was confusing at times, with right to left shift of most important
- It's difficult to have an opinion if someone is saying that "something should be done". The things that matters are "what should be done". Not only things for self-interests, because somebody are saying so, but things that means something, priorities! It is difficult to read that from this survey.
- The format of some of these questions is confusing e.g. questions that had 'don't check this line' or asking whether we have delivered 'results' on certain aspects of sustainability without defining what is considered a 'result'... The wording of the precursory question should relate directly to all of the subsequent answers and doesn't 1. I was left confused by many of the questions.
- An obstacle is the difficulty in cooperation between the catch sector and NGO’s.
- I found some responses were hard to clearly respond to due to some of the wording.
- Ideological divisions among NGO's.
- Thanks Kath and good luck with this. Happy to talk through my and/or other synthesis All the best xxx
- Am interested in the degree to which the overlap of marine issues and community based livelihood issues can intersect and drive better outcomes.
- I think the questionnaire needed to be thought through a little more. Many things not very clear as I commented on throughout and better ability to distinguish between sectors. Many questions not make sense for the conservation sector.
- Two issues with oceans protection. 1. Lack of really strong leadership. 2. Difficulties in communicating the issues facing our oceans in a more real & inspiring way so that people have

bigger bolder visions of how we can protect our oceans biodiversity and use ocean resources sustainably.
- Cross sector communication and more education within and across sectors.

Other
- Many of the latter questions are not relevant to us as an organisation.
- Well thought through.
- Maybe a shorter questionnaire would be a good idea,
- The questionnaire seems to presuppose that the problem of the world's fisheries is lack of sustainable use / conservation of marine resources. For this reason I found many of the questions to be self-serving rather than inquisitorial - it matters little what I might think about conservation if the management responses do not address the underlying causes of over-use / abuse of the marine environment. Defining the problem in this way leads to a whole lot of unclear questions that fail to address the key causes of overuse of marine resources and illicit confused responses for this reason. Perhaps it would be useful to define the problem of overuse / abuse of the marine environmental as one of open / unconstrained access to a (now) scarce resource and then see how the problem is best addressed. This would place a greater focus on the economic and social benefits of marine resource use. As noted above it is simplistic to think that 70% of the planet can and should only produce what is naturally possible by managing marine ecosystems in a steady state - this is not a long term sustainable objective in the face of population increase and increases in the standard of living of people. Any policy that proceeds on such a foundation has a poor long term future in my view.
- Government Intransigence.
- I found the questionnaire quite difficult in places it does not fit well with my company structure.
- The subject is too broad to be answered like that. However, there is a strong need to realize that it is the money that makes the world go around. We cannot expect anyone to embrace conservation if there are no incentives to do so (and not moral nor emotional). Any beche-de-mer trader with a little stack of greenbacks have ultimately more rights to that resource than me or my organization promising sustainability for preserving. Aspirations of particular poor people are high (justified) and at the same time they have a short planning horizon (characterization of being poor). But we also need to expose the rampant bribery and corruption within the fisheries sector.
- Sustainability in the fish distribution will require collaboration of many interest groups. There is a large amount of unknown by the consumer and even the distribution chain at both Retail and Food service about what is sustainable fish; where does it come from; what do I support? The seafood industry is not highly regulated in North America and motivation to support sustainability little on develop strategies for lines of sustainable seafood items that are traceable is rare. My hope is that MSC and other NGO organizations will be given the manpower / systems to identify the right Fishing companies and their sustainable items then in turn give hands on support to the companies committed to promote those products.
- Truly sustainable fisheries (and aquaculture) must be successful across economic, community (social) AND biological sustainability. The survey tilts toward the biological/environmental elements of sustainability. It needs to consider the other two "pillars." Too little emphasis is being placed on these two generally. The seafood industry is not sustainable if it is out of business, for example!

- I think that the whole sustainable seafood business is too heavily dominated by European and US views and thinking.
- See preceeding point: science and control are the keys! Fisheries management is like road safety, everybody knows that it is dangerous to drive at 150 km/h but if there is no policemen everybody does. Horizontal key: the market. For the moment, consumers have the choice between bad and good products, the choice should be between good and good
- 17 - the word "damage" is a bit too subjective for me. I am certainly prepared to accept a level of modification to the marine environment to support fisheries, so that's what has flavoured these responses. 19 - I was thinking of fisheries in general here, not just tuna. I am not convinced that MPAs are good for tuna. 21 - I was thinking of current influence, not potential influence here.
- I think the survey raises good questions about issues relating to sustainability but I did not see many questions that might shed light on the "how" all sectors could work better collectively and collaboratively. Perhaps there is opportunity in the research to gain greater understanding of strengths and weaknesses in that aspect.
- Information and data access and sharing through the supply chain is a key requirement. Clear guidelines as to what is expected regarding traceability is required so product can definitively be identified as coming from sustainable sources.
- Little has been mentioned on governance and the involvement of users and stakeholders in the processes; in developing countries with large fishery-dependent populations, the social and community aspects of fisheries, as well as the tackling of corruption in the fisheries licensing and MCS processes are serious challenges to sustainability.
- I found the questionnaire frustrating and difficult to address given my different roles in different organisations.
- A lot of interesting but intricate issues. It would perhaps need even more time and developments perhaps it is lacking a part on the causes of the current situation.
- The emphasis on marine environment and not on the people using the marine environment is a touch distressing because the environment is fine by itself -- but it is people who give it problems.
- Questions tend to be biased towards emotional concern.
- There needs to be a better understanding of what a fair and balanced (not the fox version) supply chain that encourages equity among the players that ensures that all the real costs are paid for.
- The value to society of ecosystem based management has to be better described.
- Communications on these issues is generally not strong
- Responsible fishing technologies needs to be stronger addressed

Research

- A very large amount of investment by foundations and conservation organizations is wasted in aimless descriptions of crises, frequently exaggerated that tire public opinion, and reduce effectiveness of work. Industries should increase their investments in cleaning up fisheries.
- Funding agencies forcing egocentric research groups to work together with measureable targets relating to marine conservation and sustainable fishing rather than just counting publications in a highly competitive environment that reduces cooperation
- Wicked problems need big solutions, lack of true political will really mean that at best they can only be managed.
- Generally a very interesting process until I hit the very annoying section forcing me to respond to questions re my institutions policies related to marine conservation etc. While other academics

may differ with me on this, I don't see the role of a University as providing leadership through explicit internal and to some extent arguably partisan issues.

- A valuable questionnaire subsidies to fishing might be mentioned
- Some parts of the survey were too coarse and ambiguous
- Major change can only come once the general public demands their representatives (government) to act in the interest of the general public's grandchildren, not the interest of industry or the next election.
- Issues related to fishery conservation and sustainability are typically focussed primarily on seabed impacts and discards. This is a limited focus, and misses the issues of fuel consumption and GHG emissions. A holistic focus is required to enable a wider evaluation of the environmental impacts of fishing, and tools to evaluate these impacts developed so that fisheries/fishing gears can be compared more appropriately and effectively. When considered holistically, locally caught seafood using trawl gear may have less environmental impact that imported seafood using static gear. Here, a life cycle analysis of seafood will make a valuable contribution.
- I feel that some questions on how fisheries management/sustainability advice can be better presented to fisheries/ecosystem/aquaculture managers would have provided useful insight(s) of where things can go wrong the decision-making loop.
- Public awareness.
- My sense is that conservation successes will be achieved when there are practical, concrete win-win solutions. Therefore it is more about identifying and capitalizing on real-world opportunities than motivating people to be inspired by the marine environment. I would not like to see this research conclude as Charles Clover's End of the Line did that scientists are the problem. Scientists are not really a "sector" as are industry, government, NGOs, as scientists don't necessarily have a point of view of their own--we are supposed to be neutral and objective. Therefore, if scientists' advice reflects a short-term view this is most likely because that is the political management framework they operate in.
- Funding - this is more specific to NGO or academic institutes, as research is often driven by funding direction.
- Political awareness and willingness only comes in fits and starts, which can be very frustrating
- Slightly difficult survey to answer for an academic as we should have a role of providing objective and independent research, not one of being advocates on one side or another. Thus, we also do not have formal organizational policies, but we can provide leadership, education, and outreach to the public to inform on issues.
- Greater political will is required for addressing the marine conservation and management issue. Politicians need to be educated on the key issues and the critical nature of these issues for long term survival of mankind on this earth.

Retail

- We need to work toward improving fisheries--by shutting them down we accomplish nothing.
- One key to make a change on the water is a rising awareness. So all stakeholders should try harder to educate more people about the topic.

Processing

- We need to address the larger industry players who have huge financial investments in the fisheries and cannot move forward as the damage to their financial condition remains the obstacle preventing them from making changes to reduce the damage to the eco system.
- I think you know all of my ideas!
- Inability of e.g. CFP to grasp the fact that applying a single species concept such as MSY, to multiple species is impossible, e.g simultaneously prey fish (sandeels) and predators (e.g. whitefish) - see economist Colin Clark's papers going back to 1980s. Fishing on one component will affect others. Need to think through the fisheries and biodiversity implications that the number of fish per unit area, regardless of species identity, is more consistent that the abundance of the individual species, and that species occupy different food web positions at different life stages. For fish, determining size spectrum per unit area now, and as a target (a value judgement, and possibly an interim one) and check how well measures taken are doing at reaching agreed target. Another example of inability to grasp issues is discards debate. Main aim should be to prevent killing fish you don't want to kill, not ensuring discards are brought to shore, and there are fishing methods widely used on big boats elsewhere that can avoid discards eg long lining, gill netting in Iceland, Norway, but not in UK which is predominantly trawling. Realising that this would need different skill sets and fishing boat design and equipment, but fishing industry is going to have to move away from high energy input towed gears as fuel prices will continue to increase.
- Improve partnership ngo-private parties
- Marketplace support and for-profit sectors responsibility (it was addressed a bit- but this is my focus right now).
- RFMOs or at least, Ocean management. To me that is the single biggest obstacle to sustainable fisheries, governance/ments produces the rules, perverse subsidies, weak rules, inadequate monitoring and control - in effect, all the things that, in spite of every best effort of conservationists, fishermen, industry, people like me, make - thwart our best efforts because we cannot change the management or rules by ourselves.
- I feel that there is a need to understand how to communicate across the supply chain - the lack of clarity in the communications between the agencies, the trade and the consumer is mixed - I don't think this issue has been addressed.
- Governmental bodies should focus on medium - long term benefits coming from fisheries rather than immediate-short term ones. Global trade should participate to the financing of the specific research and scientific effort to collect the right data for the right actions to be taken in sustaining marine conservation rather than just asking to the up steam of the supply chain the financial effort.
- Very comprehensive - had me mulling over a fair few points!
- Katherine - you did a great job!
- Very thorough and well thought out except #24, 25 & 26 should not be mandatory answers if company has program/ policy in place.