Review of Fish Sustainability Information Schemes

Final Report

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Acronyms

AB	Accreditation Body
ACC	Aquaculture Certification Council
AMCS	Australian Marine Conservation Society
ASI	Accreditation Services International
CBs	Certification Bodies
CCRF	Code of Conduct for Responsible Fisheries
CoC	Chain of Custody
COFI	FAO Committee on Fisheries
DEWHA	Department of Environment, Water, Heritage and the Arts (Australia)
DOF	Department of Fisheries (Thailand)
EA	European Cooperation for Accreditation
EDF	Environmental Defense Fund
EEZ	Exclusive Economic Zone
EPBC	Environment Protection and Biodiversity Conservation Act (Australia)
ETP	Endangered, threatened and protected species
FAM	Fisheries Assessment Methodology of the MSC
FAO	United Nations Food and Agriculture Organization
FOS	Friend of the Sea
GAA	Global Aquaculture Alliance
GlobalGAP	The Global Partnership for Good Aquaculture Practice
HACCP	Hazard Analysis and Critical Control Points
IAF	International Accreditation Forum
JFA	Japan Fisheries Association
MBA	Monterey Bay Aquarium
MCS	Marine Conservation Society (UK)
MEL-Japan	Marine Ecolabel Japan
MPAs	Marine Protected Areas
MSC	Marine Stewardship Council
NACA	Network of Aquaculture Centres in Asia-Pacific
NGO	Non-Governmental Organisation
NMFS	National Marine Fisheries Service (US)
NOAA	National Oceanic and Atmospheric Administration (US)
NSF	North Sea Foundation
RFMOs	Regional Fisheries Management Organisations
OECD	Organisation for Economic Co-operation and Development
OIE	Organization of Animal Health
RBF	Risk-Based Framework of the MSC
SFP	Sustainable Fisheries Partnership
TQS	Thai Quality Shrimp
UK	United Kingdom
UNCED	United Nations Conference on Environment and Development
US	United States
WTO	World Trade Organization
WWF	World Wide Fund for Nature
WWFHK	WWF Hong Kong

Executive Summary

Introduction

The benefits of sustainable fisheries and the need to mitigate the environmental impacts of fishing and aquaculture are increasingly in the public consciousness. Poorly implemented, government-run, command and control management schemes have often failed to curb fishing effort, prevent overfishing and avoid environmental degradation. Alternative, market-based approaches have shown promise and, among these, enabling informed consumer choice in seafood purchasing can generate strong motivation for improved catching and culture practices.

For this to work effectively requires good information about the provenance of the fish being purchased. Over the past decade, there has been a proliferation of national and supranational schemes designed to provide consumers and wholesalers with more and better information on the condition of fish stocks, the impacts of fishing and aquaculture practices and the effectiveness of fisheries management to help them make informed choices when buying seafood[1]. However, a lack of consistency of approach and contradictory recommendations have the potential to confuse consumers, blur the differences between what's good and what's not, and erode the benefits of better information for purchasing decisions.

This review, commissioned by the Fish Sustainability Information Group (FSIG), an international consortium representing a variety of national organisations concerned with seafood trade, is an objective assessment of a selection of certification schemes and recommendation lists for both capture fisheries and aquaculture (see box below). The intention is to provide readers with a clear picture of what makes a "good" fish sustainability information scheme. In this respect it should be a useful resource for a range of interested parties, including: consumers, who are making purchasing choices; retailers, who are offering those choices; suppliers and wholesalers who decide which fish they are going to trade; producers and fishers who decide which fisheries they will take part in or which labelling scheme to be assessed by; and of course the creators and owners of the schemes themselves.

While certification schemes and recommendation lists function quite differently, they share the common purpose of trying to influence consumers and industry towards purchasing seafood products that come from sustainable sources. The overarching goal is to modify market demand in a way that will support sustainability and ultimately benefit the environment.

Evidence for the rapid expansion of these schemes over a relatively short period of time includes the fact that WWF Germany has moved from printing 10,000 copies of its "Fish to Eat and Avoid" list in 1997 to printing some 1.5 million copies of this document ten years later. MSC started certifying fisheries in 1999 and now reports that approximately 8% of the world's edible wild caught fish are engaged in their scheme, including 40% of the global prime whitefish catch (cod, Alaska pollock, hake, haddock, hoki and saithe).

[1] Throughout this report the terms 'seafood' and 'fish' are used generally to mean all kinds of fisheries products including shellfish and those from fresh water.

Types of Fish Sustainability Information Schemes

Fish sustainability information schemes come in many different forms, but they are generally of two main types:

Certification schemes assess the status and characteristics of specific fisheries and/or aquaculture operations and may lead on to an ecolabel on retail packs or (to a lesser extent) restaurant menus, designed to confirm that the specific seafood product has come from a sustainable source. Third party certification schemes include Friend of the Sea (FOS), and the Marine Stewardship Council (MSC). Typically, participants in these schemes pay to undergo independent certification against a set of criteria or standards and, if successful, are permitted to use the ecolabel on their products. Other labels that make a variety of claims about responsible sourcing are also used by organic certifiers, national governments and supermarkets on their own brand products.

Recommendation lists provide consumers with a traffic light or similar system to indicate the sustainability, or otherwise, of particular fish or shellfish species. These lists are typically prepared by environmental NGOs such as the Marine Conservation Society (MCS), Greenpeace and WWF, often as part of wider campaigns to advocate sustainable fishing and aquaculture practices. The creators of the lists decide which products to cover and inclusion in a list is not generally at the discretion of those involved in the fisheries and aquaculture operations from which those products originate. Lists advising consumers on sustainability are also compiled by non-campaigning organisations such as the Sustainable Fisheries Partnership (SFP) and national government bodies (e.g. NOAA Fisheries in the US).

Approach

The report comprises two main components: the main report which summarises the findings; and Annex 1 which presents a detailed review of 17 fish sustainability information schemes (see box below). This selection is a broad sample of currently available schemes, including those that provide certification and ecolabelling, organic certifiers, national standards and recommendation lists. The selection includes schemes assessing aquaculture and capture fisheries, trade associations, private/independent organisations, NGOs and governmental organisations. In addition, we conducted a separate analysis of the approaches taken by three leading supermarkets, and a review of the presentation of fish sustainability information on twenty-five supermarket websites.

The principal source of information was the organisations themselves. Extensive primary research was carried out through desk-based research, questionnaires, direct interviews and consultations with the schemes to obtain up-to-date information. This was benchmarked against guidelines developed by the FAO for capture fisheries and aquaculture (FAO *Guidelines for the Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries* (FAO, 2005a) and the draft FAO *Technical Guidelines on Aquaculture Certification* (FAO, 2008)).

Fish Sustainability Information Schemes reviewed during this study

Certification Schemes

- **Standard-setting, certification and eco-labelling schemes**: Friend of the Sea (FOS); Marine Ecolabel Japan (MEL-Japan); Marine Stewardship Council (MSC); Global Aquaculture Alliance (GAA); and GlobalGAP.
- **Organic certification:** Naturland was reviewed as an example of this type of scheme, including discussion of others such as Soil Association, Debio and Krav.
- **National standards and guides:** Australian Government Department of Environment, Water, Heritage and the Arts (DEWHA); Thai Quality Shrimp (TQS).

Recommendation lists

- **Campaigning environmental NGOs:** Greenpeace; Marine Conservation Society UK (MCS); Monterey Bay Aquarium (MBA); World Wide Fund for Nature (WWF) International; WWF Hong Kong Australian Marine Conservation Society (AMCS); The North Sea Foundation: Goede Vis;
- **Non-campaigning NGOs:** Sustainable Fisheries Partnership (SFP);.
- **Government advisory bodies;** NOAA Fisheries FishWatch;

Retailers

- **Supermarkets:** Carrefour, Tesco and Wal-Mart were reviewed, and a further assessment was undertaken of the websites of 25 supermarket retailers from Europe and North America.

Main Findings

This study argues that while certification schemes and recommendation lists have had substantial success in increasing awareness of the issues associated with sustainable fishing and aquaculture within a limited number of mainly developed country markets, the proliferation of schemes has been accompanied by increasing consumer confusion, industry concern, retailer guardedness, and a reduction in confidence, resulting from inconsistent approaches and contradictory advice. The report identifies seven key attributes that all schemes must address in order to mitigate these problems: Scope; Accuracy; Independence; Precision; Transparency; Standardisation; and Cost-effectiveness. These key attributes align with FAO guidance.

Specific Findings

1. Certification schemes generally apply only to those fisheries/aquaculture facilities seeking to become certified. Most of the drive and initiative for improving sourcing policies has come from industry itself, including the fishing sector, purchasers, processors and retailers. From the fishers point of view adopting responsible fishing practices can raise their profile, so that processors and retailers looking for sustainable and ethically sources products notice them.

2. Certification processes are often time consuming and costly. The decision to seek certification is both active and voluntary. A fishery or aquaculture facility will generally chose one certification scheme to promote its environmental credentials, based on an assessment of potential costs and benefits involved, together with market recognition and how they can take advantage of this.

3. Certification is primarily industry funded, although other funding mechanisms exist. Governments have provided financial support to help fisheries go through private certifications, but this is not common. National certification schemes are mainly government funded, but the costs may be recovered from industry through taxes and fees. The industry generally bears the cost of preparing documentation and meeting any imposed conditions. Fully supported government schemes can risk being accused of providing subsidies to fishers or producers, for example in the case of water quality analysis for aquaculture facilities. However, there are likely to be costs associated with a lack of certification, for example through the loss of access to export markets.

4. The producers of recommendation lists are free to assess any product they wish and have the option of 'blacklisting' those that do not meet their sustainability criteria. In preparing recommendation lists, environmental NGOs will put campaign priorities (e.g. a global ban on bottom trawling) ahead of fishery-specific, peer-reviewed outcomes from certification schemes such as MSC (which has certified some bottom trawl fisheries). Seafood products therefore appear on multiple lists as well as having a certification and ecolabel, with conflicting advice for consumers in some high profile cases (e.g. Alaskan Pollock, New Zealand hoki, yellowfin tuna and Chilean seabass).

5. Certification schemes have the advantage of being able to drill down to the practices of a particular fishery or aquaculture facility and hence assess the sustainability of a clearly defined and distinct unit. By contrast, recommendation lists tend to assess a fish species or group of species sourced from a region. This can mask variations among both well-managed and poorly-managed fisheries that all become tarred with the same brush, leading to advice that can conflict with certification scheme outcomes.

6. Certification of products coming from developing world fisheries and aquaculture operations is less frequent than from developed countries because of high costs and the production systems being more likely to be small scale and data-poor. Certification schemes may therefore preferentially (but unintentionally) focus purchasing on products from developed countries. Uptake of certification schemes in developing countries varies, but all schemes are seeking to improve this.

7. Recommendation lists fill an important niche because the number and availability of certified, labelled products is still relatively low. While the level of detail on each product is much less, the number and range of species and products covered by lists is understandably much greater. Recommendation lists therefore may help direct consumers towards a wider range of choices in their seafood purchasing decisions of uncertified/unlabelled products.

8. Different certification schemes certify different things, have different standards, and use different assessment methodologies. There is significant variation between schemes in the scope of the assessments conducted, in the extent to which the data used relate to the actual stock under consideration, how up-to-date the data are required to be, whether stock status reference points are explicitly considered, and whether the stock assessment data are peer-reviewed to verify their quality and applicability. This has resulted, in some cases, in over-exploited stocks being certified, contrary to the FAO Guidelines. There has been little effort to date to seek equivalence between different, competing schemes, particularly in the capture fisheries sector.

9. Certification schemes generally have a well defined timetable for the audit and overall duration of a certificate and the procedure for re-certification. Some NGO recommendation lists also review their information regularly, but others have a less rigorous sunset policy or updating procedure, meaning that information may continue to circulate after its currency has expired.

10. It is generally more difficult to trace exactly how a particular conclusion has been reached for recommendation lists than for certification schemes. The latter usually have more transparent procedures and/or peer review processes.

11. To promote objectivity (and in line with the FAO Guidelines), certification schemes have de-coupled the certification process from the standard setting, although in some cases the final certification decision still rests with the standard setter. Recommendation lists tend to be compiled unilaterally by each organisation and may be significantly driven by wider campaign objectives, hence introducing the potential for bias in the results.

12. Certification schemes are improving their compliance with FAO Guidelines, as are recommendation lists, even though the Guidelines are not specifically designed for them. In this regard, we note that the willingness of the selected organisations to participate in the review process was generally high.

Recommendations

1. The FAO draft Guidelines for aquaculture should be completed and finalised as soon as possible. All fisheries and aquaculture certification standards and information schemes should voluntarily undertake to comply fully with the relevant FAO Guidelines (either wild capture or aquaculture as appropriate) and this compliance should be independently verified periodically.

2. Certification schemes and producers of recommendation lists (specifically NGOs) should enhance their consistency and credibility by seeking greater standardisation and harmonisation. Given the generally higher level of scrutiny provided by certification schemes, we recommend that list owners better align their lists with the outcomes of the schemes, providing the schemes conform well to FAO guidelines. Where conflicts persist, recommendation lists should give clear justification for their difference of view. This will encourage increasing recognition of equivalence between certification standards and recommendation lists and will simplify procedures for industry; ideally complying with one sustainability standard should be sufficient, rather than having to go through the expense of numerous assessments against different standards. Greater equivalence is an achievable outcome as schemes align themselves better and more transparently with the FAO guidelines.

3. In line with FAO Guidelines, recommendation lists should have an independent standard setting procedure and should distance themselves from undertaking assessments of fisheries and aquaculture operations against their standards, for example through the having assessments conducted by independent assessment bodies or groups of experts.

4. Certification schemes and recommendation lists should all ensure that the data they are utilising are as current as possible, and are appropriate to the fisheries or aquaculture units being assessed. Recommendation lists in particular need to improve their control of information, with specific indication of the publication date of each list and a clear procedure for updating when new information becomes available. In essence, each scheme must have a clear, scientific and documented procedure for accessing, processing, verifying, updating and

presenting comprehensive and relevant information in a balanced, unbiased way. In particular, recommendation lists need to define more clearly the units of listing and make their work available for peer review.

5. With the growing number and variety of ecolabels, and consumers' general lack of awareness of labels and fish sustainability issues, retailers must increasingly take responsibility for selecting and promoting trustworthy ecolabels on behalf of their customers. They should continue developing and coordinating their own responsible sourcing policies with existing schemes.

6. Certification schemes and recommendation lists should continue their efforts to improve the applicability of their schemes to products from small-scale and data-deficient fisheries and aquaculture operations (particularly those in the developing world) so that these products do not suffer unintentional market access barriers. Initiatives that support fisheries improvement plans to bring these fisheries within the scope of certification should be given a high priority.

7. Before committing to a certification scheme, industry and producers need to weigh up potential costs and benefits. Consideration needs to be given to whether industry is in a position to undertake the work necessary to take advantage fully of the market recognition associated with certification and labeling.

Conclusion

Our hope is that uptake of these recommendations will lead to a reduction in consumer confusion surrounding which fish to eat and which to avoid and a growth in confidence throughout the supply chain in the benefits of genuine sustainable sourcing. Our study observed a high level of consensus in both commercial seafood firms and the NGO community regarding the importance of these schemes, and a strong level of commitment among all parties to a sustainable future for the oceans. The challenge now is to maximise the value of fish sustainability information schemes in contributing to this overarching goal by providing consumers and businesses with clearer, more accurate and more recent data, so that they can make properly informed choices about seafood.

1. Introduction

'Fish is one of the most globally traded products, yet there's no global standard for sustainability'
Keith Sainsbury

The benefits of sustainable fisheries and the need to mitigate the environmental impacts of fishing and aquaculture are increasingly in the public consciousness. Poorly implemented, government-run, command and control management schemes have often failed to curb fishing effort, prevent overfishing and avoid environmental degradation. Alternative, market-based approaches have shown promise and, among these, it is now widely recognised that enabling informed consumer choice in seafood purchasing can generate sufficient motivation for improved catching and culture practices.

Across the world, a number of organisations have established themselves as arbiters of sustainable fisheries, developing schemes that provide product labels and/or advice to traders and consumers to help them make informed choices when purchasing seafood[2]. Several certification schemes exist, and a number of NGOs and other organisations also engage in communicating information about fish sustainability. The sustainability assessment methodologies they use to do this are wide ranging. They also vary with respect to species and regional coverage, procedures for updating in response to new information, and in the use and presentation of outputs.

While it is proving difficult to demonstrate clear environmental benefits arising from changes in industry and management practices associated with these schemes, there is clear evidence that the market responds, particularly with respect to specific labelling schemes. This highlights the importance of developing a clear understanding of sustainability information schemes and how they work, what they tell us about the products to which they are applied, the information sources used and the extent to which specific claims are substantiated and verifiable.

This review, commissioned by the Fish Sustainability Information Group (FSIG)[3] aims to provide an objective review of organisations that are providing fish sustainability information via certification or other means, for both capture fisheries and aquaculture. It reviews a selection of the main organisations, globally, with a focus on schemes that communicate information to consumers, but some business-to-business schemes are also considered.

The intention is to give readers a clear picture of what makes a good fish sustainability information scheme. In this respect it should be a useful resource for a range of interested parties, including consumers, who are making purchasing choices; retailers, who are offering those choices; suppliers and wholesalers who decide which fish they are going to trade; producers and fishers who decide

[2] Throughout this report we use the terms 'seafood' and 'fish' generally to mean all kinds of fisheries products including those from fresh water and shellfish.

[3] FSIG is an international consortium of organisations formed in 2008 from an initiative by the UK's Sea Fish Industry Authority (Seafish) and others. It is composed of Main and Associate members along with an Observer member drawn from countries representing a variety of national organisations concerned with seafood trade. Full Members: Sea Fish Industry Authority, Edinburgh; Fisheries Research and Development Corporation, Australia; The New Zealand Seafood Industry Council Ltd, New Zealand; Dutch Fish Product Board, Netherlands; Norwegian Seafood Export Council, Norway; BIM Irish Sea Fisheries Board, Ireland. Associate Member: Bundesverband der Deutschen Fischindustrie und des Fischgrosshandels e.V., Germany. Observer member: Food and Agriculture Organization of the United Nations, Rome. Chair: Professor James A. Young, Professor of Applied Marketing, University of Stirling; Secretariat: Philip Palfrey, Seafish.

which fisheries they will take part in; and of course the creators and owners of the schemes themselves.

It is important to recognise that the sector is changing rapidly. New schemes are being developed, and existing ones are evolving. A number of internal assessments were on-going at the time of the review and subsequent changes have been made. This has made it difficult to keep the review current, but in cases where we were informed of changes up to the end of June 2009, the new information has been incorporated to the extent possible.

1.1. Structure of the report

This report comprises two main components: the main report which summarises the findings; and Annex 1 which presents a detailed review of a selection of seventeen fish sustainability information schemes, with each one allocated a separate section. These seventeen include ecolabelling organisations, organic certifiers, national standards and recommendation lists. In addition, there is a separate analysis of the approaches taken by three leading supermarkets, and a review of the presentation of fish sustainability information on twenty-five supermarket web sites.

The remainder of Section 1 of the main report presents an overview of the state of marine fisheries, and describes the rise in the importance of fish sustainability information. A key component of any review of this kind is the FAO guidelines for ecolabelling of marine capture fisheries and the draft guidelines for aquaculture[4]. These are described in Section 1.4. Section 2 of the main report explains the methods used, particularly the process of selecting the schemes for review and the approach to contacting and reviewing those schemes. Section 3 traces the history and development of the schemes, the relationships between them and summarises the detailed information presented in Annex 1. Following this is an analysis of the role of fish sustainability information schemes from three different perspectives: the industry, supermarket retailers and consumers, and how the success of the schemes can be gauged. Finally, in Section 4 we consider the desirable features of fish sustainability information schemes in the ambit of good practice, and how these features may be applied to both certification schemes and to recommendation lists.

1.2. The state of world fisheries and aquaculture[5]

Capture fisheries and aquaculture supplied the world with about 114 million tonnes of fish for human consumption in 2007, representing a per capita supply of 17 kg (live weight equivalent); the highest on record. Of this total, aquaculture accounted for 44 percent. Total world fisheries production, including non-food uses exceeded 135 million tonnes in 2005, 2006 and 2007 (see Table 1).

Global capture fisheries production reached 92 million tonnes in 2004, with an estimated first-sale value of US$ 84.9 billion. China, Peru and the United States of America remained the top producing countries. World capture fisheries production began to level out in the late 1980s and has been relatively stable at about 90 million tonnes since, despite improvements in technology and increasing effort (FAO, 2006; Figure 1). The increasing demand for fish has been satisfied by the

[4] FAO Members agreed a set of Guidelines for Ecolabelling of Marine Capture Fisheries and FAO is also developing certification guidelines for aquaculture, as well as continuing work on certification guidelines for inland capture fisheries (see Section 1.4 for more details).

[5] This chapter references information from both FAO (2006) and FAO (2009) reference materials (see Section 5, References). Both documents have been utilised in order to cover information that was included in FAO (2006) but then not brought back in the subsequent report (FAO 2009).

expansion in the aquaculture industry. Aquaculture has grown rapidly at an average rate of 8.8 %[6] per year since 1970, compared with only 1.2 % for capture fisheries (FAO, 2006). Aquaculture production in 2007 was reported to be 50.3 million tonnes with a value of US$78.8 billion (FAO, 2009). Of the world total, China is reported to have accounted for nearly 70 % of the quantity and over half the value. All regions showed increases in production from 2002 to 2004, led by the Near East and North Africa region and Latin America.

Currently, three quarters of commercially exploitable stocks are fully exploited, over-exploited or depleted, with only one quarter under- or moderately exploited (i.e. with potential for increased production). Many environmental organisations highlight the plight of marine capture fisheries by quoting these data. However, a stock which is 'fully exploited' is not an environmental concern, if it is a managed fishery that is exploited sustainably. When this is taken into consideration, the figures are less dramatic: half of fisheries are fully exploited, and one quarter of fisheries are over-exploited, depleted or recovering from depletion, and thus yielding less than their maximum potential (FAO, 2009).

Table 1 World fisheries and aquaculture production and utilisation (million tonnes)

Production	2003	2004	2005	2006	2007
Inland					
Capture	8.6	8.6	9.4	9.8	10.0
Aquaculture	23.1	25.2	26.8	28.7	31.0
Total inland	**31.7**	**33.8**	**36.2**	**38.5**	**41.0**
Marine					
Capture	79.6	83.7	82.8	80.1	80.0
Aquaculture	15.8	16.7	17.4	18.6	19.3
Total marine	**95.4**	**100.4**	**100.2**	**98.7**	**99.4**
Total World Fisheries					
TOTAL CAPTURE	***88.2***	***92.3***	***92.2***	***89.9***	***90.1***
TOTAL AQUACULTURE	***38.9***	***41.9***	***44.3***	***47.3***	***50.3***
Total	**127.2**	**134.2**	**136.5**	**137.2**	**140.4**
Utilisation					
Human consumption	102.2	104.2	107.7	111.0	113.7
Non-food uses	24.9	30.0	28.7	26.1	26.7
Population *(billions)*	6.4	6.4	6.5	6.6	6.7
Per capita food fish supply *(kg)*	16.1	16.2	16.5	16.8	17.0

Source: FAO (2009) (incorporating revised Chinese data).

[6] FAO 2008 states that aquaculture annual growth rate is 6.9% which shows a decrease in growth.

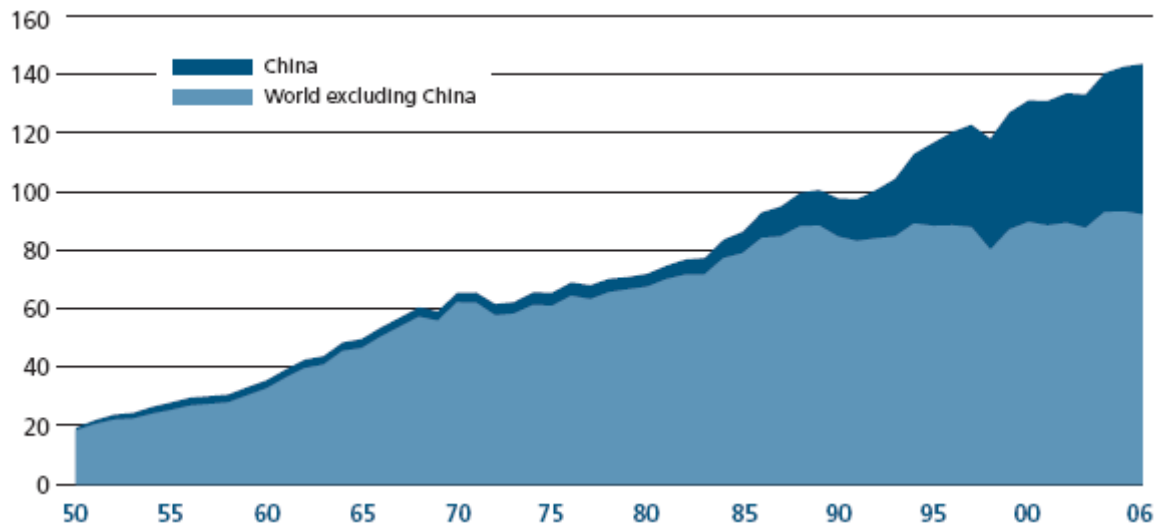

Figure 1 World Capture and Aquaculture Production
Source: FAO (2009).

Market projections predict demand for fish will continue to grow. With most capture fisheries being fully- or over-exploited, pending significant recovery in major fish stocks, the expansion in demand is expected to be met by the aquaculture industry (FAO, 2006).

1.3. Fish sustainability information

Worldwide, discussions on fisheries management focus significantly on responsible fishing, better management of fisheries and sustainable development of aquaculture. Fish sustainability information schemes, including certification schemes and recommendation lists, are an important part of this process.

The Organisation for Economic Co-operation and Development (OECD) has defined environmental labelling as the 'voluntary granting of labels by a private or public body in order to inform consumers and thereby promote consumer products which are determined to be environmentally more friendly than other functionally and competitively similar products'.

The rationale is that if consumers are given environmental information and a choice between products, many will choose those products that have fewer environmental impacts (Phillips *et al.*, 2003). Allowing the consumer to select more environmentally-friendly products, in turn, encourages producers to develop and market products that meet consumers' requirements and expectations (Weber, 2002). Many see this as a means of gaining a competitive advantage in the market place.

1.3.1. The rise of certification schemes and recommendation lists in fisheries and aquaculture

Environmental labelling dates back to 1977 with the inception of the Blue Angel environmental labelling program in Germany (Bruce *et al.*, 2003). The concept was globally endorsed in 1992 at the United Nations Conference on Environment and Development (UNCED), where governments agreed to 'encourage expansion of environmental labelling and other environmentally related product information programs designed to assist consumers to make informed choices'.

In the last decade there has been a rapid rise in the number of fish sustainability information schemes and they now take many different forms. They include: third party certification schemes that include the option of labelling of products from specific fisheries and aquaculture operations; lists of 'good' and 'bad' fish species published by environmental NGOs; supermarkets and seafood brands providing advice directly to their customers on their sourcing policy and product lines and standards and advisory services provided by national governments[7]. Targets for these schemes include both consumers and seafood businesses. Schemes may cover information on fish stock status, type of fishing gear and its potential environmental impacts, impacts on other aquatic species particularly related to bycatch species and endangered species, wider environmental impacts, animal health and welfare, and social and labour aspects.

With this rapid increase in the number and type of schemes there has been little opportunity for harmonisation of methods and advice, leading to a significant amount of consumer confusion. Particularly in the fisheries sector there is conflicting advice presented by third party certification schemes and NGO sponsored recommendation lists about what is sustainable and what is not. This is clearly counterproductive for the sector as a whole and needs to be addressed as a matter of urgency. In aquaculture certification there has been more movement towards standardisation and equivalence to counter this problem. For example, in early 2009, GlobalGAP signed an agreement with GAA "to work cooperatively to develop and harmonise certification systems for the aquaculture sector world-wide"[8]. This alignment aims to harmonise standards, avoid duplication of effort and in turn reduce confusion. WWF have also joined GlobalGAP in formal partnership to certify producers in the build up to the launch of the Aquaculture Stewardship Council (ASC)[9] in 2011[10].

The range of schemes reflects the variety of incentives to which organisations are responding. Fisheries, aquaculture companies, supermarkets and seafood brands are seeking a competitive advantage in existing markets, increased access to otherwise difficult markets, increased price for product and wider acceptability of products by consumers. Governments equally are interested in promoting domestic products on the global market, but also in developing standards as one of the means of promoting greater responsibility in their national fishing industry[11] and as part of a broader environmental agenda. Environmental NGOs view the provision of fish sustainability information both as an important service to their constituents to support informed consumer choices, and a means of motivating the fishing industry to adopt more environmentally-sound practices and thereby obtain product endorsement.

Despite the international community's general acceptance of these schemes, the approach has caused controversy in several international fora, including the World Trade Organization (WTO) Sub-Committee on Trade and Environment and the FAO's Committee on Fisheries. Concerns about ecolabelling include its potential to act as a barrier to trade and its coherence, or lack of it, with international trade rules (FAO, 2005–2009). Schemes have also come under scrutiny from different groups for not providing an accurate assessment of sustainability, for being limited in their application (e.g. being constrained geographically) and a lack of flexibility, potential for bias, or their

[7] In addition to these schemes we also note the contribution of the IUCN Red List of Threatened Species which identifies particular species at risk of extinction and also seeks to provide a global index of the state of change of biodiversity. This is not a guide or labelling scheme in the same mould as the others that are included in this review, but it may provide information that is utilised in the compilation of those schemes.

[8] http://www.globalgap.org/cms/front_content.php?idcat=9&idart=747

[9] The ASC is a new initiative by WWF announced in January 2009. It will be responsible for working with independent, third party entities to certify farms that are in compliance with the standards. This initiative has been the result of the past years of collaborating efforts between WWF and contributing parties in the WWF Aquaculture Dialogue. http://www.worldwildlife.org/who/media/press/2009/WWFPresitem11339.html

[10] http://www.intrafish.no/global/news/article250041.ece?service=print

[11] Note that this is significantly driven by the FAO Code of Conduct for Responsible Fisheries and the development of international and national plans of action on specific issues such as Illegal, Unreported and Unregulated (IUU) fishing.

(un)willingness to update assessments in the light of new information. To bring some order to the sector, the FAO has developed guidelines for ecolabelling in fisheries that are the most comprehensive current benchmark for best practice. A complementary set of guidelines for aquaculture is currently under development. These are both described in detail in Section 1.4 and are used extensively in this review.

The European Commission has recently proposed the development of a European Community Ecolabel scheme[12], which would include both fisheries and aquaculture products. It would cover the most significant environmental impacts during the life cycle of products, in particular the impact on climate change, impact on nature and biodiversity, energy and resource consumption, generation of waste, emissions to all environmental media, pollution through physical effects and use and release of hazardous substances.

For convenience, in this report we have simplified the range of schemes into two main categories: certification schemes (that may or may not result in labelling of products) and recommendation lists[13]. An important distinction between these categories is that while certification schemes cater for fisheries and aquaculture operations that are actively seeking recognition that they have achieved a defined performance standard, recommendation lists provide appraisals of whatever range of seafood they chose to cover. A standard for a recommendation list that enables identification of both positive and negative issues is therefore quite different to one that only sets a high standard that the fishery must attain. Certification schemes say nothing about the fisheries that have not sought the standard; the absence of a certification and/or label, while it may result in a commercial disadvantage relative to a certified product, it is not automatically a 'black mark' meaning the fish should be actively avoided. This is a particularly important issue in cases where certification is not universally accessible to all fisheries.

1.3.2. Certification Schemes

Certification schemes assess the status and characteristics of specific fisheries and/or aquaculture operations and may lead on to an ecolabel on retail packs or (to a lesser extent) restaurant menus, designed to confirm that the specific seafood product has come from a sustainable source. Third party certification schemes include Friend of the Sea (FOS), and the Marine Stewardship Council (MSC). Typically, participants in these schemes pay to undergo independent certification against a set of criteria or standards and, if successful, are permitted to use the ecolabel on their products. Other labels that make a variety of claims about responsible sourcing are also used by organic certifiers, national governments and supermarkets on their own brand products.

The prevalence of ecolabelled seafood on the market is increasing, and a variety of different labels are emerging in different countries. In seafood, an ecolabel is a distinctive logo or statement which certifies that the fish has been harvested or produced in compliance with conservation and sustainability standards. Ecolabelling schemes set their own standards, against which fisheries and aquaculture operations can be assessed. If these are met, they are awarded the right to use the scheme's logo on products originating from the fishery or aquaculture operation. An important aspect of ecolabelling schemes is that they also include a chain of custody assessment to ensure that only product originating from approved fisheries or aquaculture operations bear the logo of the scheme. Third party certification is considered the most robust type of assessment process. This involves the main organisation establishing the criteria for certification (the standard), and independent, accredited 'certifying bodies' (CBs) conducting the assessments which determine

[12] Brussels, 16.7.2008 COM(2008) 401 final

[13] The schemes selected for the review are listed in Section 2.1

whether or not a particular fishery or aquaculture operation meets those criteria. This is the arrangement which the FAO guidelines assume for ecolabelling schemes.

Organic certifiers assess and identify products derived from aquaculture operations that use organic processes in the production system. Examples include Naturland, the Soil Association, Debio and Krav. Organic standards are not applicable to wild capture fisheries (indeed, application of an organic label to wild fishery products is illegal in the USA), but many aquaculture farms and products are achieving organic certification.

National standards are set by some government agencies for assessment of fisheries, fish stocks, management systems, or aquaculture operations. There may or may not be a label associated with the final product, and schemes may be compulsory or voluntary.

1.3.3. Recommendation lists

Recommendation lists offer consumers a traffic light or similar system to indicate the sustainability, or otherwise, of particular fish or shellfish species. These lists are typically prepared by environmental NGOs such as the Marine Conservation Society (MCS), Greenpeace and WWF, often as part of wider campaigns to advocate sustainable fishing and aquaculture practices. The creators of the lists decide which products to cover and inclusion in a list is not generally at the discretion those involved in the fisheries and aquaculture operations from which those products originate. Lists advising consumers on sustainability are also compiled by non-campaigning organisations such as the Sustainable Fisheries Partnership (SFP) and national government bodies (e.g. NOAA Fisheries in the US).

The purpose of recommendation lists is to give consumers advice on their seafood purchasing decisions and to increase awareness of the sustainability issues surrounding fisheries and aquaculture. The lists are mainly aimed at consumers, but are also transferrable to businesses and some provide assistance for use in policy making. The lists fill an important niche because the number and availability of certified, labelled products is still relatively low. While the level of detail is much less, the number and range of species and products covered is understandably much greater. The information contained in the lists varies from the comprehensive guides to fish species and the individual stock status within the species, to provision of consumer ‘guides’ or ‘lists’ of fish to avoid eating including how purchasing choices can assist the sustainable seafood industry. Some government agencies (e.g. NOAA Fisheries in the US) also provide information on stock sustainability, management and environmental impacts of fisheries and aquaculture operations to help consumers in making informed choices.

1.4. FAO Ecolabelling Guidelines

In response to the increasing interest in ecolabelling for the seafood sector, FAO has been developing guidelines for fisheries and aquaculture. While acknowledging that they are voluntary and are not universally and equally applicable to all of the schemes being reviewed, we have used these guidelines in this review to support our view of best practice. The guidelines are most clearly applicable to labelling schemes rather than, for example, schemes that produce recommendation lists of fish to eat or to avoid. We note, however, that certain guiding principles are universally applicable, including the need for transparency, which, as stated in the guidelines ‘should apply to all aspects of an ecolabelling scheme including its organisational structure and financial arrangements’.

The guidelines for ecolabelling of fisheries have been approved, but the aquaculture guidelines are still under development and discussion. The main difference, currently, is that the fisheries guidelines set out three minimum substantive criteria for ecolabel schemes, all of which should be

complied with, whereas the draft aquaculture guidelines set out four parts to the minimum substantive criteria, and it is not yet clear whether certification schemes will have to comply with all four parts or whether they will be able to pick and choose between them. Both the fisheries and draft aquaculture guidelines cover environmental aspects, but the aquaculture guidelines go further to include food safety, animal health and welfare, and social aspects as well.

1.4.1. Marine capture fisheries

The FAO *Guidelines for the Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries*[14] (FAO, 2005a) are voluntary. They are applicable to ecolabelling schemes that are designed to certify and promote labels for products from well-managed marine capture fisheries and focus on issues related to the sustainable use of fisheries resources (FAO, 2005–2009). The guidelines refer to principles, general considerations, terms and definitions, and procedural and institutional aspects of ecolabelling of fish and fishery products from marine capture fisheries. Most importantly, they set out the minimum substantive requirements and criteria for assessing whether a fishery can be certified and an ecolabel awarded to a fishery. Ecolabelling schemes are clearly free to apply additional or more stringent requirements and criteria related to sustainable use of the resources or other aspects for certification. The 28th session of COFI adopted amendments to the FAO fisheries ecolabelling guidelines in March 2009[15]. However, the revised guidelines are not yet available and the amendments made were mainly to expand and improve definitions to increase clarity. Therefore this review is based on the 2005 version of the guidelines.

The following are the over-arching principles that should apply to ecolabelling schemes for marine capture fisheries:

- Be consistent with the 1982 United Nations Convention on the Law of the Sea and the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, the FAO Code of Conduct for Responsible Fisheries and the World Trade Organization (WTO) rules and other relevant international instruments.
- Recognise the sovereign rights of States and comply with all relevant laws and regulations.
- Be of a voluntary nature and market-driven.
- Be transparent, including balanced and fair participation by all interested parties.
- Be non-discriminatory, not create unnecessary obstacles to trade and allow for fair trade and competition.
- Provide the opportunity to enter international markets.
- Establish clear accountability for the owners of schemes and the certification bodies in conformity with international standards.
- Incorporate reliable, independent auditing and verification procedures.
- Be considered equivalent if consistent with the guidelines.
- Be based on the best scientific evidence available, also taking into account traditional knowledge of the resources provided that its validity can be objectively verified.
- Be practical, viable and verifiable.
- Ensure that labels communicate truthful information.

[14] In October 1998, the FAO convened a Technical Consultation open to all FAO Members and Observers to explore the feasibility of developing non-discriminatory technical guidelines for ecolabelling of products from marine capture fisheries. After several years of stakeholder consultation, the guidelines were ratified by the FAO Committee for Fisheries in 2005. The guidelines are available on the FAO website at http://www.fao.org/docrep/008/a0116t/a0116t00.htm.

[15] Report of the twenty-eighth session of the Committee on Fisheries, Rome, 2–6 March 2009. FAO Fisheries and Aquaculture Report No. 902. Advance Copy. Rome: FAO.

- Provide for clarity.
- Be based, at a minimum, on the minimum substantive requirements, criteria and procedures outlined in the guidelines.
- Transparency should apply to all aspects of an ecolabelling scheme.

Under the procedural aspects, the guidelines detail three principal matters:

1. the setting of certification standards;
2. the accreditation of independent certifying bodies; and,
3. the certification that a fishery and the product chain of custody are in conformity with the required standard and procedures.

There are three important components of the certification standard:

1. the management system;
2. the stock under consideration; and
3. ecosystem considerations.

This emphasises the importance not just of the status of the fish stock, but also how well the stock is managed. Indeed, a primary requirement of the FAO guidelines for the stock under consideration is that it 'is not overfished, and is maintained at a level which promotes the objective of optimal utilization and maintains its availability for present and future generations'. However, it goes on to state that 'In the event that biomass drops well below such target levels, management measures should allow for restoration within reasonable time frames of the stocks to such levels'. Good management is therefore an important part of any standard. It is well known that managing fisheries is not an exact science and stocks may decline for reasons other than fishing pressure. It is therefore vital to have a management system that responds to these circumstances to bring about recovery and also to avoid, as far possible, a repeat of the problem. The application of a precautionary approach in the face of uncertainty and/or highly variable stocks is a clear requirement in this regard.

1.4.2. Aquaculture

The FAO, in partnership with the Network of Aquaculture Centres in Asia-Pacific (NACA), is developing guidelines for the development, organisation and implementation of credible aquaculture certification schemes. The FAO *Technical Guidelines on Aquaculture Certification*[16] (FAO, 2008) are still in draft form. However, the draft guidelines are well-developed and many Members are ready to adopt them with only minor changes. The draft guidelines were therefore used in this review as an indicative document.

The guidelines cover the range of issues which are considered relevant for certification in aquaculture, and an aquaculture certification scheme may address one or all of these issues:

1. animal health and welfare;
2. food safety and quality;
3. environmental integrity; and/or
4. social responsibility.

The draft aquaculture certification guidelines were developed on the basis of discussions held and recommendations made during a number of expert workshops in 2007 and 2008, and were considered by member countries at the 2008 session of the FAO Committee on Fisheries Sub-

[16] Available online at ftp://ftp.fao.org/docrep/fao/meeting/014/ai770e.pdf.

Committee on Aquaculture. The main issues and concerns that require further discussion and may result in substantive changes include[17]:

- Whether animal welfare and social responsibility issues should be included at all. However, many existing aquaculture certification schemes do include such issues, and their inclusion would therefore help in promoting harmonisation between the various schemes.
- Whether all four areas should be compulsory or whether certification schemes should be able to pick and choose between them.

Credible aquaculture certification schemes consist of three main components: standards, accreditation and certification. Similar to the guidelines on marine capture fisheries, the draft aquaculture guidelines therefore cover the following procedural aspects:

1. standard setting processes required to develop and review certification standards;
2. accreditation systems needed to provide formal recognition to a qualified body to carry out certification;
3. certification bodies required to verify compliance with certification standards.

1.5. Comments on relevant literature

The principal source of information for this review has been the fish sustainability information schemes themselves. As described in Section 2.3, we carried out extensive primary research through questionnaires, direct interviews and desk-based research to obtain up-to-date information across a wide range of subject areas. Where appropriate, relevant literature sources are also cited in the text.

Ecolabelling and certification of capture fisheries and aquaculture is a rapidly developing sector. Studies become out-of-date very quickly as schemes continuously adapt and improve their approaches and methodologies. Nevertheless, a number of existing papers and reports on ecolabelling provided important background for this study. While these may not be specifically referenced in the report, we acknowledge their importance in influencing way in which the review was conducted and the subject areas covered. Notable among these were papers from the 2008 Seafood Summit in Barcelona, Spain, particularly the session on standards and certification. A member of the project team also attended the FAO/OECD Round Table on Eco-labelling and Certification in the Fisheries Sector, held in The Hague, Netherlands in April 2009, where several very useful presentations were made and discussions held.

We were also kindly given access to a number of previously-commissioned reports, some of which are not publicly available, or are in the process of being prepared for general release. These are listed below:

- A comparison of on-pack seafood labels for sustainable fisheries. August 2008. A report to the World Wildlife Fund, United States for internal research - not for public release (kindly provided with permission). Kees Lankester, Scomber, Amsterdam. Contact k.lankester@scomber.nl.

- Potential costs and benefits of fisheries certification for countries in the Asia Pacific region. Macfadyen, G. and T. Huntington (2007). Report prepared for the APFIC Regional Workshop on Certification Schemes for Capture Fisheries and Aquaculture, HCM City, Viet Nam, 18-20 September 2007. Poseidon Aquatic Resource Management Limited, Lymington, UK. 63p.

[17] From a letter dated 07-07-2009 from Rohana Subasinghe, Secretary, COFI Sub-Committee on Aquaculture. Available at ftp://ftp.fao.org/FI/DOCUMENT/aquaculture/TGAC/comments_FAO_secretariat/FAO_secretariat_ e.pdf.

- Review of Guidelines for Ecolabelling of Fish and Products from Capture Fisheries, and Recommended Minimum Substantive Requirements. Report for the Expert Consultation on Ecolabelling Guidelines for Fish and Fishery Products, Rome, 3-5 March 2008. Keith Sainsbury, February 2008 (being developed as an FAO Technical Paper).

- Etude de Faisabilite de la Mise en Place d'un Ecolabel Dans la Filiere des Produits de la Peche Maritime. Rapport Final au 08/02/08. Office National Interprofessionnel des Produits de la Mer et de l'Aquaculture (OFIMER). Etude réalisée par: Pôle Filière Produits Aquatiques et Bureau Vertias. Projet cofinance par L'Union Europenne.

- Ecolabelling Schemes for Fisheries Products. March 2007. Marie Christine Monfort, Consultant.

- Ecolabelling and Fisheries Management. P. R. Gardinier and K. Kuperan Viswanathan. 2004. Worldfish Center Studies and Reviews 27, 44.

- Ecolabels and Marine Capture Fisheries: Current Practice and Emerging Issues. April 2008. Sally Washington. GLOBEFISH Research Programme, Vol. 91 Rome, FAO. 2008. P. 52.

2. Approach and methodology

2.1. Scoping and selection of schemes

A list of certification schemes and other organisations that provide guidance on sustainable fisheries and seafood was compiled. 29 schemes were identified in total, from which 17 were selected to be reviewed in detail. The selection aimed to cover a range of different types of scheme to provide representative and informative coverage of the following:

- Certification schemes and recommendation lists
- Schemes covering aquaculture and capture fisheries;
- Geographic coverage; and
- Status i.e. trade body, private/independent organisation, NGO, governmental organisation.

The final selection is listed below. The complete independent reviews of these organisations are provided in Annex 1.

Certification schemes:

- Friend of the Sea (FOS);
- Marine Ecolabel Japan (MEL-Japan);
- Marine Stewardship Council (MSC);
- Global Aquaculture Alliance (GAA);
- GlobalGAP.
- Naturland (organic certifier)[18];
- Australian Government Department of Environment, Water, Heritage and the Arts (DEWHA);
- Thai Quality Shrimp (TQS).

Recommendation lists:

- Australian Marine Conservation Society (AMCS);
- Greenpeace;
- Marine Conservation Society UK (MCS);
- Monterey Bay Aquarium (MBA);
- NOAA Fisheries FishWatch;
- The North Sea Foundation: Goede Vis;
- Sustainable Fisheries Partnership (SFP);
- World Wide Fund for Nature (WWF) International;
- WWF Hong Kong.

In addition to these schemes, we reviewed three major international supermarkets (Carrefour, Tesco and Wal-Mart), and a further assessment was undertaken of the websites of 25 supermarket retailers from Europe and North America[19]. Retailers was considered as a single 'scheme', yet the review covered three companies in detail and a further 22 in less detail. Therefore the review was unable to go into the same depth for retailers as it did for the individual fish sustainability information schemes, most of which were based on a single organisation.

[18] We include discussion of other organic certifiers such as Soil Association, Debio and Krav

[19] Aldi, Albert Heijn, ASDA, Auchan, Carrefour (Cora), Champion, Coop, Continente, Delhaize, Dia, EDEKA, El Corte Ingles, Kaufland, LiDL, Marks & Spencer, Metrogroup, Migros, Mono prix, Morrisons, Pingodoce, Sainsbury's, Tesco, Waitrose, Wal-Mart, Wholefoods.

2.2. Framework for the collection and compilation of information

A framework was prepared to provide structure for the collection of information. The aim was to ensure a consistent approach to the review of the various organisations. The framework covered a range of performance criteria including aspects of:

- **System integrity** criteria such as transparency, objectivity and robustness;
- **Influence** criteria such as market share and penetration; and
- **Outcome** criteria such as ecological sustainability, environmental benefits and social equitability.

These were divided into five principal categories:

1 Organisation/Scope/Facts (who are they?);
2 What do they claim (what do they do?);
3 How do they do it? (including: methodology; information; system integrity);
4 What are the results?;
5 Organisational costs and funding.

A basic list of questions was developed under each of the five categories above, for the desk-based review (see Section 2.3.1). The aim was to begin the collection of data that would enable an assessment of the schemes relative to (as appropriate) the FAO Guidelines for the Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries, and the FAO Guidelines on Aquaculture Certification (in development).

The list of questions was then expanded for the consultation phase of the review (see Section 2.3.2) to address the content of the FAO guidelines more comprehensively. Composite questions were developed that attempted to adequately cover all key aspects from the FAO guidelines (based on the principles and minimum substantive criteria), without becoming an overly burdensome list of questions (in the FAO documents each set of minimum substantive criteria includes over 100 separate paragraphs, each of which could be developed into one or more questions).

There were certain aspects of the expanded list of questions that were only applicable to certification schemes for fisheries, other aspects only applicable to aquaculture operations, and other aspects that were only applicable to recommendation lists. In these cases, sub-sections were created for each scheme to answer only those questions relevant to the scheme in question.

In relation to the five categories above, Category 1 covered basic issues such as the type of organisation and its primary role. Whether they develop standards for certification and whether the scheme is restricted by charter to certain countries were also included.

Category 2 looked in more detail at what information the schemes claim to provide. For example: whether it is species-specific or if it can be applied to all species; the kind of claims that the scheme makes (sustainable fish, organic produce, healthy options, social responsibility etc); and, to whom the scheme provides information — whether principally for consumers or businesses.

Category 3 included information about how the schemes work. This covered how the schemes define sustainability, what sources of information are used for the assessments and how information is referenced. Also covered was the provision for consultation, stakeholder input, peer review and formal challenge.

Category 4 considered the kinds of claims, if any, the schemes make with respect to environmental, economic and social benefits, and the extent to which these claims have been independently verified.

Category 5 considered how the organisations that run the schemes are funded. This provides an insight into the influences on the organisations and the potential for conflicts of interest in the processing and presentation of information.

The full list of questions used in the review is provided at the end of Annex 1.

2.3. Reviewing the schemes

2.3.1. Desk-based research

A desk-based review of publically-available information was conducted for each scheme, based on the initial basic list of questions in the framework. Publically-available documents were accessed, in particular from organisations' websites, with research focussing on: objectives; methodology for certification or assessment of fisheries; dissemination and review; and financial information (funding sources and costs). This information provided the basis for assessing effectiveness in terms of presenting accurate, current and comprehensive information on fish sustainability. To ensure consistency of approach, in addition to preparing the standardised templates for the collection of information, significant internal coordination was undertaken among members of the research team.

2.3.2. Contacting organisations

The organisations were contacted directly to collect more detailed information on the schemes and their operation. In many cases contact with personnel within the organisations was established early on in the review process. Where this had not been the case, contact with the correct person was made so that they were aware of the review and expecting to receive an information request. The full set of questions (with information already gathered through the desk-based review included) was circulated to each scheme by email, with a request for them to review the information already gathered and complete the missing information where possible.

Follow-up contact with the organisations was made by telephone, and/or meetings conducted in person, to talk through the questionnaire and discuss and clarify the details of the responses. Further relevant information was provided by the organisations by email and an ongoing dialogue was established.

Direct communication was achieved with all of the organisations, and most provided their input and support to the review, although some provided more detail than others. In all, the review was able to achieve greater understanding of their methods and processes through their collaboration.

The review of the retailers, as a group analysis covering 25 different organisations, did not go into the same level of detail as the review of the other 17 schemes. It was based only on publically-available information and did not involve direct consultation with each company, due to the large number of companies reviewed in the group (in comparison with each scheme, which involved a single organisation in each case).

The fundamental questions posed in the review of supermarkets included:

- Do the stores make public any commitment or promise of sourcing sustainable fish?
- Do they have sustainable sourcing policies for seafood?
- Does the extent of their involvement in sourcing sustainable fish extend beyond these policies?
- What ecolabels do they promote via their website?
- What issues do the stores write about on their websites?

2.3.3. Compilation of information

Information was compiled in Excel spreadsheets for storage and analysis. A text summary was written for each scheme (Annex 1) and was circulated to each organisation for their comment and inputs.

2.4. Analysis and synthesis

The information presented in Annex 1 was summarised and then synthesised to provide key information on the two main approaches: certification schemes and recommendation lists. Key areas of interest were the scope of the organisations running the schemes, the content of the scheme, methods used to assess fisheries, developing country and data deficient fisheries, and organisational costs and funding. Patterns, comparisons and concerns are drawn out. The specific perspectives of industry, retailers and consumers are also discussed, along with the issue of how to measure success – both in terms of how the schemes do this themselves and how it might be done more objectively.

3. Discussion and analysis

This study has reviewed a selection of fish sustainability information schemes from around the world covering wild-caught fishery and aquaculture products. In this section we provide brief summaries of the individual schemes, and discuss relationships between them; full reviews are provided in Annex 1. We discuss and compare the features of the schemes and how effectively they present accurate, current and comprehensive information on fish sustainability. We discuss the application and effectiveness of the schemes from a range of perspectives, including the seafood industry, retailers and consumers and consider the measurement of success with respect to different objectives. Key issues arising from this analysis are summarised in Section 4.

3.1. Summary of schemes reviewed

Table 2 provides a brief outline of each scheme. Tabular summaries of these two groups are provided in Table 3 and Table 4.

Table 2 Summary of fish sustainability information schemes reviewed

Scheme	Summary
Certification Schemes	
Friend of the Sea (FOS)	Sets a standard for third party certification of both capture fishery and aquaculture products. Provides a label for final products. Fisheries and aquaculture products are assessed from all over the world, including a significant number from developing countries.
Marine Ecolabel Japan (MEL-Japan)	A non-profit, private sector organisation which is part of the Japan Fisheries Association. It sets a standard for certification of capture fisheries. Currently it assesses Japanese product for the Japanese market. Certification process is not third party.
Marine Stewardship Council (MSC)	Sets a standard for third party certification of capture fisheries. MSC licences its label for use on certified product. It assesses fisheries from around the world although so far most are in developed countries.
Global Aquaculture Alliance (GAA)	A non-profit, trade association that developed Best Aquaculture Practices (BAP) certification standards. GAA sets standards for aquaculture products, including shrimp hatcheries, processing plants, and shrimp, tilapia and catfish farms. Standards can be applied to product from all around the world.
GlobalGAP	An independent, private sector organisation that sets voluntary standards for the certification of agricultural products, including aquaculture, but not capture fisheries. It is a business-to-business scheme and has no consumer label. It serves as a practical manual for Good Agricultural Practice that can be used globally.
Naturland	An independent 'organic farmers association' where certification is only one of many activities. Sets standards for organically-produced agriculture products, including aquaculture and wild capture fisheries.
DEWHA Environment Protection and Biodiversity Conservation Act (EPBC)	A government-run compulsory scheme that assesses all Australian Commonwealth-managed and State-managed fisheries in accordance with the 'Guidelines for the Ecologically Sustainable Management of Fisheries'. This is required for product to be permitted for export.
Thai Quality Shrimp (TQS)	An initiative by the Department of Fisheries of Thailand, delivered by the DOF's Marine Shrimp Culture Research Institute. The government sets the standard and assesses farms against the standard. Product assessed is only from Thailand and only from aquaculture. It is voluntary.

Recommendation Lists	
Australian Marine Conservation Society (AMCS)	An Australian marine conservation NGO which produces a 'Sustainable Seafood Guide' using a traffic light colour coding scheme. Products are restricted to those available in Australia and include both wild fishery and aquaculture products.
Greenpeace	An international campaigning NGO with many individual national branches. Greenpeace assess capture fishery and aquaculture products according to its own methodology. Produces an international and various national 'red lists' of fisheries and aquaculture products they consider to be unsustainable.
Marine Conservation Society UK (MCS UK)	An NGO that campaigns on a range of marine issues. It provides advice to consumers through its 'Fishonline' website and 'Pocket Good Fish Guide'. A traffic light system is used to categorise them against the methodology which they developed. Includes both farmed and wild-caught products.
Monterey Bay Aquarium (MBA)	MBA run the 'Seafood Watch' programme which provides sustainable fisheries and aquaculture information to businesses and consumers. It assesses products internationally using a methodology that it developed.
NOAA Fishwatch	The National Marine Fisheries Service (sector of NOAA) operates the 'Fishwatch' initiative, which provides information on the management and state of USA-managed fish stocks. It is only a small component of NOAA's activities. It focuses on capture fisheries and includes some aquaculture information.
North Sea Foundation (NSF)	NSF run the 'Goede VIS' programme, which focuses on providing information on commercially sustainable fisheries in the Netherlands. NSF and WWF collaborated to produce their methodologies which the fisheries and aquaculture products are assessed against.
Sustainable Fisheries Partnership (SFP)	An independent, global NGO that provides strategic and technical guidance to businesses with the aim of influencing supplier behaviour and catalysing or encouraging fisheries improvement projects. SFP has developed 'FishSource'; a web-based information resource that summarises the available scientific and technical information on selected capture fisheries (does not cover aquaculture).
World Wide Fund for Nature (WWF) International and WWF Hong Kong	An international environmental NGO which provides a fish recommendation list as part of their work on sustainable fisheries. They developed a methodology (in collaboration with NSF) to assess international capture fisheries and aquaculture products. A traffic light system is used to categorise them. The information is available for consumers online through the international and national websites. WWF was also involved in the initiative to create the MSC and is now working to create the Aquaculture Stewardship Council (ASC).
Retailers	
Supermarkets	A selection of 25 supermarkets from around the world was assessed for their approach to provision of information on sustainable fisheries.

Table 3 Summary characteristics of certification schemes

						For fisheries			For aquaculture												
Scheme	3rd party certifier (3rd) or National Standard (NS)	Wild fisheries	Aquaculture	Dedicated to seafood	Seafood as part of broader product certification	Stock status	Ecosystem impacts	Management system	Animal health and welfare	Food safety and quality	Environmental integrity	Social responsibility	Source of information? Quality of information?	Frequency of re-certification (for fisheries/aquaculture)	Independent accreditation body?	Independent certification bodies? (i.e. 3rd party)	Certification process allows stakeholder input/challenge	Traceability included	Small-scale and/or data deficient certified?	How many fisheries have they certified?	How many aquaculture operations have they certified?	Indicative cost of certification/audit (€)
FOS	3rd	✓	✓	✓		✓	✓	✓	ind	ind	✓	✓	FAO, RFMO or NMRA	3–5 years	✓	✓	✓	✓	✓	~65[1]	~25	8,000
MSC	3rd	✓	×	✓		✓	✓	✓					SA	5 years	✓	✓	✓	✓	Few	55		30,000
MEL-Japan	3rd	✓	×	✓		✓	✓	✓					Japan national SA	5 years	×	✓	✓	✓	×	1		15,000
GlobalGAP	3rd	×	✓		✓				✓	✓	✓	✓	Audit	Annual	✓	✓	×	✓	✓			400
GAA	3rd	×	✓	✓					✓	✓	✓	✓	Audit	Annual[2]	×	✓	✓	✓	✓		72[3]	3,175[4]
Naturland	3rd	✓	✓		✓	✓	✓	✓	✓	ind	✓	✓	Local SA	Annual	×[5]	✓/×[6]	F✓/A×	✓	✓	1	?	750
TQS	NS	×	✓	✓					✓	✓	✓	✓	Audit	Annual	×	×	✓/×[7]	✓	✓		250	0
DEWHA	NS	✓	×	✓		✓	✓	✓					Australia national SA	0-5 years	×	×	✓	×	✓	121		0

Notes:

SA= Stock assessment from the fishery; Ind = indirectly. i.e. issue is not specifically addressed and is considered to be beyond the scope and remit of the scheme, but some aspects are indirectly addressed through other measures.

1 Counts individual species within a single audit as separate fisheries. Count by country and species was 30 for fisheries. In practice, some are mixed fisheries (e.g. line fisheries for swordfish, kingfish, kawahai, tarahiki and trevally in NZ.

2 Not specified, but none of the 'certified until' dates for certified farms, hatcheries or processing plants were more than one year in the future.

3 Refers to the number of hatcheries (15) and farms (57) certified. In addition 91 processing and 7 repacking facilities have also been certified.

4 Relates to cost of membership or registration and the cost of certification audit or annual inspection (see Table 13 for details).

5 Accreditation is not to Naturland's procedures, but to ISO65.

6 Naturland certification committee takes the certification decision, not the certification body.

7 Review indicated 'there is the possibility for peer review and debate but not necessarily resulting in an improved outcome.'

Table 4 Summary characteristics of recommendation lists

					For fisheries			For aquaculture							
	Wild fisheries	Aquaculture	Dedicated to seafood	Seafood as part of broader environmental campaign	Stock status	Ecosystem impacts	Management system	Animal health and welfare	Food safety and quality	Environmental integrity	Social responsibility	Frequency of updates	Is the information source clear i.e. referenced?	Process allows stakeholder input and/or challenge	Small-scale and developing country assessed
AMCS[1]	✓	✓		✓	–	–	–	–	–	–	–	–	–	–	–
Greenpeace	✓	✓		✓	✓	✓	✓	×	×	✓	✓	On receipt of new information & annually	✓	✓	✓
MBA	✓	✓		✓	✓	✓	✓	ind	×	✓	ind	6 monthly	✓	✓	✓
MCS UK	✓	✓		✓	✓	✓	✓	✓	×	✓	×	~annually	✓	✓	✓
NOAA: FishWatch	✓	×	✓		✓	✓	✓					Constantly under review	✓	✓	×
NSF: Goede VIS	✓	✓	✓		✓	✓	✓	×	×	✓	×	~annually	✓	✓	-
SFP	✓	×	✓		✓	✓	✓					Constantly under review	✓	✓	×
WWF	✓	✓		✓	✓	✓	✓	✓	×	✓	×	Resource dependent; some nationals annually	✓	✓	✓

Notes:

– = information not received from organisation. ind = indirectly i.e. issue is not specifically addressed and is considered to be beyond the scope and remit of the scheme, but some aspects are indirectly addressed through other measures.

1 AMCS did not provide any details on their assessment processes and scoring criteria.

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3.2. Relationships between schemes

3.2.1. Timeline and history

The first ecolabels in the seafood sector began to appear in the 1990s, mainly in relation to incidental catch issues, for example the Dolphin-safe label developed by the Earth Island Institute (Washington, 2008). The first organic standards (for aquaculture) also appeared in the mid-1990s with Debio and Naturland. The Soil Association (UK) had developed draft organic aquaculture standards in 1989, but these were only approved as interim standards in 1998 and certified produce became available in 1999. Fisheries sustainability labels began to appear later, with the MSC standards in 1999. The last decade has seen an increase in the number of labels for aquaculture, and the last five years has seen an increase in the number of labels for wild-caught fisheries.

The timeline of the development and establishment of the various schemes reviewed in this study is provided in Table 5 and Figure 3.

Table 5 Summary sequence of involvement of schemes reviewed in fisheries and aquaculture certification standards and recommendation lists

Period	Beginning of involvement in provision of fish sustainability information
1995-1998	MSC; GAA/AAC; MBA; TQS; Naturland (aquaculture)
1999-2001	DEWHA (EPBC Act); Krav; Soil Association; NOAA 'FishWatch'
2002-2004	MCS (UK); Geode VIS; GlobalGAP DEWHA (approval)
2005-2007	Greenpeace; AMCS; WWF; Naturland (capture fisheries); SFP; FOS; MEL-Japan

Of the schemes reviewed here, the first standards were developed in 1995 by Naturland (originally founded in 1982) for pond culture carp, and discussions began between WWF and Unilever to establish the MSC. Two years later the MSC was registered as a charitable organisation in London and independent operations began two years after that in 1999.

The GAA/AAC was founded in 1997, the same year as EurepGAP (now GlobalGAP), although the latter did not start certifying aquaculture until 2003. 1997 also saw the first fish guide produced by MBA — 'What is a fish lover to eat?' — as part of their Fishing for Solutions exhibit in 1997–1999. In 1998 Thailand's Department of Fisheries (DOF) started to develop its TQS initiative with the establishment of the Marine Shrimp Research Institute (MSRI). Krav started developing its aquaculture standards in 1999, the same year that the Soil Association began certifying aquaculture products. Krav's capture fisheries standards followed two years later in 2001. NOAA started to develop their 'FishWatch' initiative in 2001 and the following year, also in the US, MBA initiated its 'Seafood Watch' programme for consumers and businesses.

There was a proliferation of seafood guides between 2002–2005, with the MCS UK, AMCS, Greenpeace, WWF and NSF 'Goede VIS' programme. MCS (UK) produced the first guide for the UK market in 2002. The development of the Greenpeace 'Redlist' coincided with the launch of their supermarket seafood campaign in 2005. In November 2006, the Naturland Assembly of Delegates adopted the first Standards for Sustainable Capture Fishery, for which the first pilot project for Lake Victoria Nile perch was completed in 2009.

The last few years have seen the establishment of new ecolabelling schemes Friend of the Sea (in 2006) and MEL-Japan (in 2007). The SFP was also established in 2006 as an independent NGO and the Soil Association developed their organic shellfish standards.

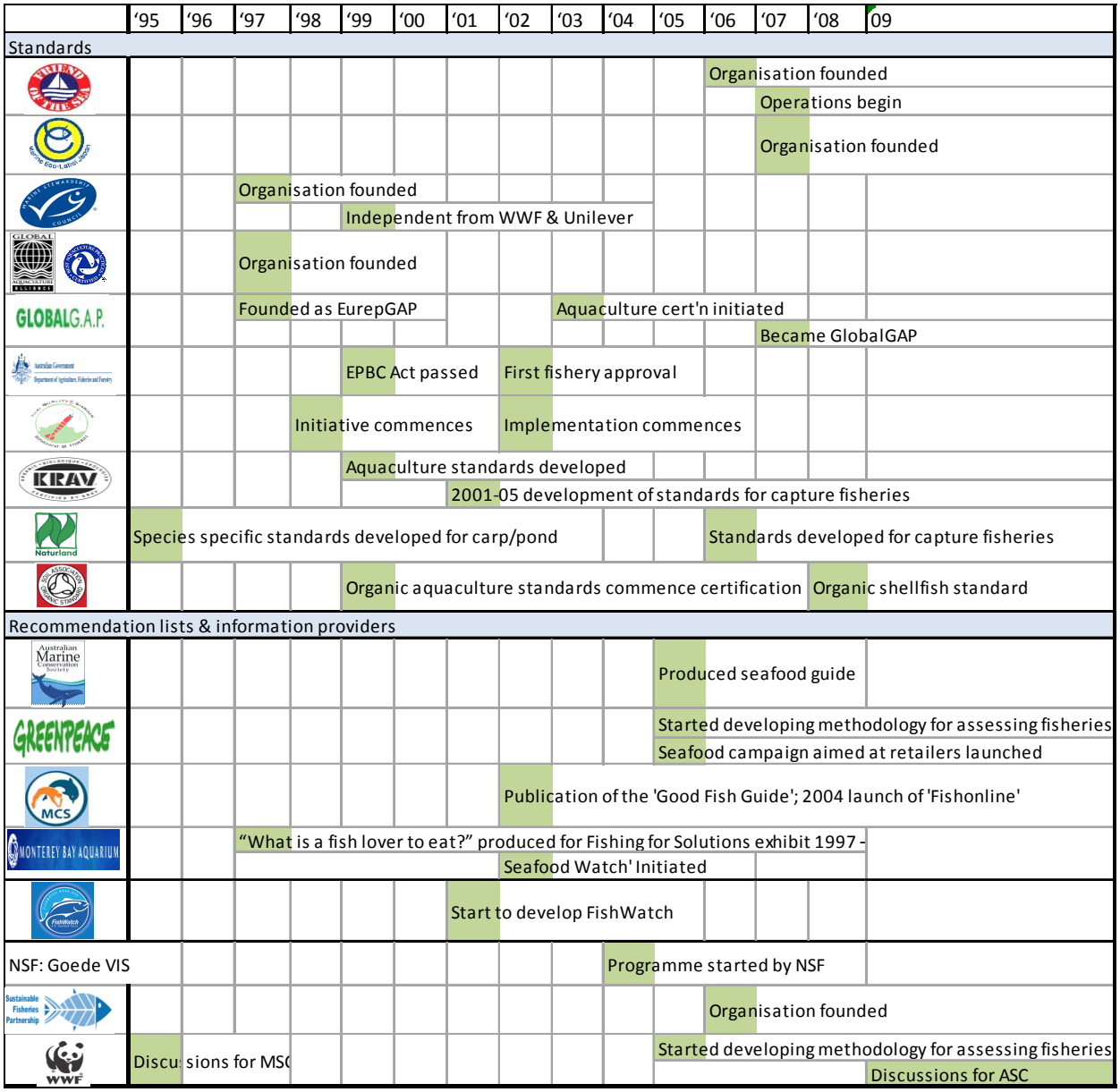

Figure 2 Timeline showing when schemes developed standards and began operations

3.2.2. Equivalence and links between schemes

Fisheries and aquaculture certification schemes generally do not recognise equivalence with other schemes. There is no statutory requirement for equivalence, but the FAO Guidelines do state that ecolabelling schemes for marine capture fisheries should be considered equivalent if they are consistent with the Guidelines. . Although there has been significant expansion in the sector, there are still relatively few options for certification in capture fisheries: FOS, MSC, MEL-Japan and Naturland. The differences in approach, criteria and philosophy that currently exist between MSC, FOS and MEL-Japan appear too great at the present moment to foresee equivalence being recognised between them. It also may be regarded as a poor business strategy for one scheme to recognise equivalence with another when they are continually seeking a competitive advantage in attracting fishery clients.

Naturland's fisheries standard is very new and it is really too early to judge, but the fact that it includes detailed (and case-specific) social criteria makes it difficult to imagine equivalence being recognised with the other schemes that do not include social criteria. One area where progress could be made,

however, is in national schemes (e.g. DEWHA) being recognised as equivalent to third party certification schemes.

The organic certification schemes for aquaculture products promote equivalency between each other[20] to a greater extent than the other certification schemes. This is likely to be due to the much longer time periods that these organisations have been established and the harmonisation promoted through IFOAM[21]. For example, Naturland will cooperate with other organic labels that want to rebrand an aquaculture product under the Naturland label (e.g. for market acceptability) or vice-versa, but there is no formally-established equivalence for aquaculture products because the relatively small number of aquaculture projects so far does not justify the cost to develop this. The matrix in Figure 3 demonstrates the predominance of collaboration and recognition of equivalence among the organic labels.

The way equivalency works in practice, is for a farm that is certified by one scheme to be relabelled to another scheme through a re-assessment of the inspection report rather than through a whole new inspection visit. For example, a Naturland certification can be converted to a Bio Suisse certification in this way. A similar arrangement exists with the Soil Association for products destined for the UK market.

GlobalGAP has a detailed benchmarking system which allows other schemes to be checked for equivalence with GlobalGAP and 18 equivalent schemes currently exist (e.g. ChileGAP, JGAP (Japan) and Farm Assured Produce (UK)). As mentioned in Section 1.3.1, in early 2009, GlobalGAP signed a cooperative agreement with GAA with the aim of harmonising standards, avoiding duplication of effort and in turn reducing confusion. WWF have also joined GlobalGAP in formal partnership to certify producers in the build up to the launch of the ASC in 2011. Together the organisations will develop guidance materials, checklists and training resources for auditors.

This kind of equivalence recognition is not yet prevalent within capture fisheries because the schemes are more recently established, the overall number of certification schemes is lower and the detail of the standards and content differ between schemes. Equivalence may be more achievable for aquaculture than for capture fisheries labels at the current time, since there are more labels available for aquaculture operations and they have been in operation for longer.

With respect to recommendation lists, there is some evidence of equivalence in capture fishery assessments. For example, WWF (UK) has not developed its own recommendation list; instead it directs consumers to the MCS (UK) fish list. Many of the NGO websites including MBA and SFP direct consumers to the various other NGO websites and often to the MSC website. The IUCN Redlist of endangered species is referred to by several organisations (particularly NGOs but also FOS). However, none of them use it as the sole source of information; they all conduct broader research to make 'sustainability' assessments.

In what would have been a more significant move, there were some early discussions between WWF, NSF, Greenpeace and MCS (UK) regarding a collaborative effort to develop a single methodology for the assessment of capture fisheries, however, a common approach was not forthcoming. Greenpeace, WWF and MCS (UK) reported that during assessments they do cross-check whether the species or fishery appears on the another's list and generally do not add a species to their 'green-list' if it is on another's 'red-list'. However, environmental NGOs all have their own specific conservation policies and if a positive assessment by another organisation contradicts that policy they will not adopt the same outcome for the fishery or product in question. For example, Greenpeace's view on the detrimental

[20] Organic certification is confined to aquaculture products and does not cover wild capture fisheries.

[21] IFOAM is the International Federation of Organic Agriculture Movements and aims to lead, unite and assist organic agriculture worldwide. They have developed IFOAM Norms which include the Basic Standards (IBS) which provide general guidance to organic standards development. While IFOAM promotes harmonisation, recognition of equivalence between labels is not a given and is agreed between individual labels.

effects bottom-trawling means they will red list products from a fishery which uses this fishing method even if it has been classified as sustainable by another scheme. By mid 2009, thirteen fisheries involving bottom trawling had been certified by the MSC. Of these, many are red listed by Greenpeace. In the case of New Zealand hoki, Greenpeace New Zealand specifically states that "in spite of being certified as sustainable under the international Marine Stewardship Council, this fishery has one of the severest ecological impacts of any New Zealand fisheries". Other MSC certified fisheries that are red listed by Greenpeace include Germany North Sea saithe and Ekofish Group-North Sea plaice.

This lack of equivalence and resultant inconsistency is bound to lead to consumer confusion and a general undermining of the credibility of certification schemes and recommendation lists as a whole. As has happened with the schemes covering organic standards, all schemes should be seeking and practicing greater equivalence. This should be a reasonably expectable outcome as schemes align themselves better and more transparently with the FAO guidelines.

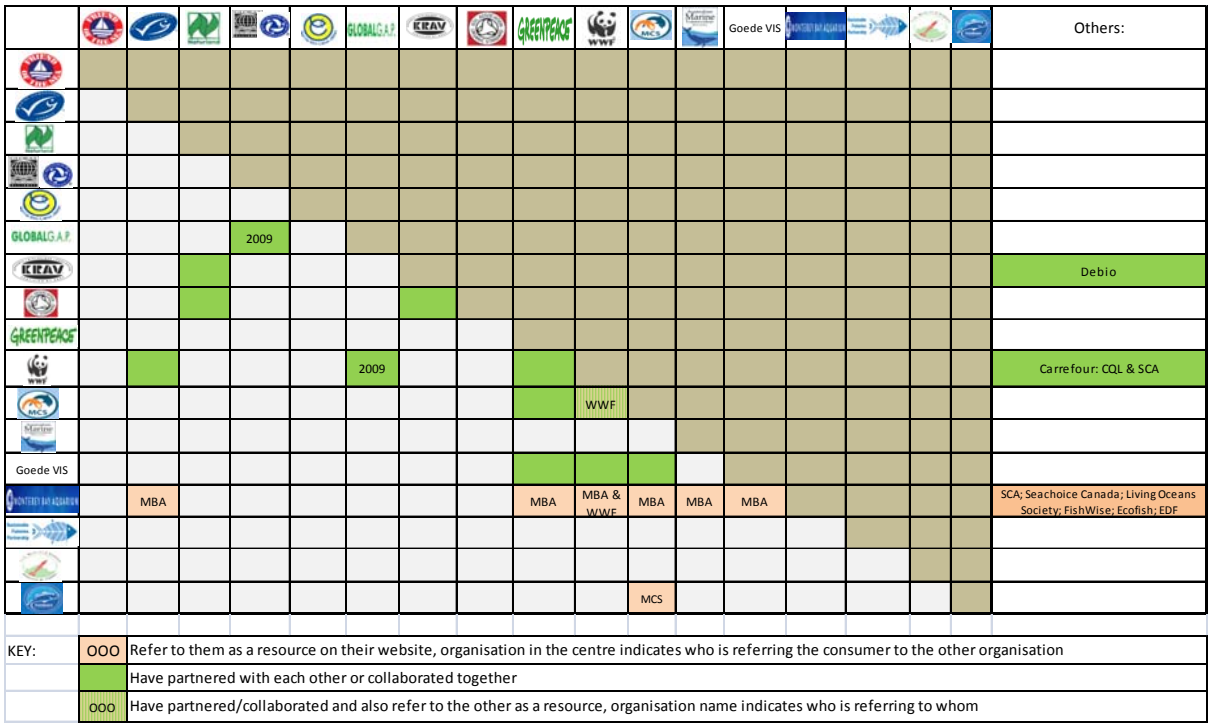

Figure 3 Matrix showing interactions and collaborations between schemes

3.3. Certification schemes

3.3.1. Organisation and participation

The schemes included in this section are FOS, MEL-Japan and MSC, GAA, GlobalGAP, Naturland, DEWHA and TQS. These Schemes have been established under a variety of organisational structures: FOS and MSC are independent, non-profit organisations; MEL-Japan is a private sector (non-profit) organisation; GlobalGAP is a private sector body; GAA is a non-profit trade association; and Naturland is an 'organic farmers association'. TQS and DEWHA are both government-run schemes.

Most of these schemes are focussed purely on the certification of fish and seafood. Some are exclusive to wild capture fisheries (MSC, MEL-Japan, DEWHA) or aquaculture (GlobalGAP, GAA, TQS); only FOS and Naturland cover both. Only GlobalGAP and Naturland cover products other than seafood[22].The

[22] GlobalGAP has standards for fruit and vegetables, flowers and ornamentals, combinable crops, green coffee and tea, cattle and sheep, diary, pigs and poultry, and for aquaculture: salmonids and shrimp, and pangasius and tilapia in development.

national standards are of course run as one activity of a government department, which has many other roles.

Participation in these schemes is voluntary. Participants pay to undergo independent certification against a set of criteria or standards[23]. Most schemes are targeted at consumers and businesses (wholesalers, processors, retailers) and include the option of an identifying label or logo being placed on the final product; only GlobalGAP (which is a purely business-to-business (B2B) scheme) and DEWHA do not have this option. The labelling of products is clearly consumer-orientated, but schemes offering a label also have a B2B component. For example, a significant proportion of the products coming from MSC certified fisheries are not labelled as such because there is no chain of custody certification in place. Certifications are nevertheless both sought after and regarded as useful because they provide an assurance of management and stock stability that is appreciated by buyers and may enable product to be sold into markets that would otherwise not be accessible.

None of the third party and industry schemes are restricted by charter to specific countries, and are therefore potentially global in scope (See Section 3.3.4 for coverage of developing countries). Government-run schemes, by contrast, are restricted by definition to their respective countries (i.e. TQS will only certify farms in Thailand; DEWHA applies only to Australian fisheries). Although MEL-Japan has no specific country restriction, it is unlikely to apply to fisheries outside Japan since one of the stated reasons for developing the scheme was the desire to recognise Japanese fisheries management as being fundamentally different from 'western' fisheries management.

The main markets for certified products are in Europe (Germany, Netherlands, UK, Italy, Switzerland and France), but the USA is also important for TQS, MSC, GlobalGAP, GAA and DEWHA. China and Japan are important markets for DEWHA-certified exports, and Japan is likely to be the main market for MEL-Japan-certified products.

3.3.2. Minimum substantive requirements

In this section we discuss the content of the certification standards, and extent to which they address the minimum substantive requirements set out in the FAO Guidelines. In the guidelines there are three categories of requirements for capture fisheries and four for aquaculture (see **Error! Reference source not found.** and Table 7 respectively). The content of the aquaculture standards is currently less consistent than the fisheries standards, but we note that the guidelines for the former are still in draft form and the final version may not include all of the current requirements, or some requirements may be optional.

With the exception of DEWHA all the schemes have procedures for certifying the chain of custody of certified products. DEWHA do not consider this to be necessary at present because virtually all Australian fisheries have maintained export accreditation. They do, however, recognise that traceability may become necessary in the future to maintain the integrity of supply lines if a fishery that loses export approval is targeting the same species as another fishery that still has it.

3.3.2.1. Certification of wild capture fisheries

The FAO guidelines specify three main aspects that capture fisheries' certification schemes should cover: the management system; the status of the stock under consideration; and the wider ecosystem. All of the certification schemes we reviewed that apply to fisheries include these three essential components in their standards, but the way in which they assess performance varies significantly. Of the

Naturland has standards for beekeeping, forest management, textiles, cosmetic products, organic, aquaculture and wild capture fisheries.

[23] Except for DEWHA which is a compulsory requirement for all Australian Commonwealth fisheries and Australian State Government managed fisheries that wish to export their products. As such, it is essentially a permitting scheme that certifies management systems.

certification schemes reviewed, the MSC is clearly the one that makes the most comprehensive, robust and transparent assessment of performance. The ways in which the other schemes are deficient in this regard are discussed below and summarised in Table 6. In addition to the three components required by the FAO, we note that FOS and Naturland both include social aspects in their standard for fisheries, while MSC and MEL-Japan do not.

Management system

All the fisheries certification standards include a requirement to be consistent with national law and only MEL-Japan fails to explicitly extent this to international law. In the case of MEL-Japan, any international laws which are not specifically accounted for in the national laws and regulations of Japan would not be assessed. The MSC and DEWHA standards provide the most robust assessment of the management system, going into a greater level of detail on its effectiveness and implementation than the others. We note, however, that the FOS standard was updated in March 2009, bringing in a number of improvements in terms of the detail required for the stock and the management systems for the fisheries being assessed. The updated criteria address the management system more effectively than the old criteria[24]. MEL-Japan requires there to be an 'effective' management system but does not provide further details; instead specific guidelines are developed by the certification body on a case-by-case basis.

All the fisheries certification standards include requirements for data and information to be collected on the fishery, but MSC is the only scheme that specifically requires the data and information to be sufficient for achieving the other objectives (i.e. assessment of stock status and ecosystem impacts). Monitoring, control and surveillance or compliance measures are not consistently included in all schemes, and where they are mentioned, they are not necessarily essential for certification. The use of the precautionary principle in management is assessed under FOS, MSC and DEWHA, but not by MEL-Japan or Naturland.

Target stock status

MEL-Japan requires that the target resource is maintained at the 'level of sustainable use' although this is not explicitly defined. The certifiers mainly rely on data used in Japan's national stock assessments. The data used are relatively up-to-date (e.g. the 2008 assessment used 2007 stock assessment which was based on data from 2006), however, concerns were expressed in public comments on one assessment that these data were insufficient. MEL-Japan's response to this comment focused on the requirement to use the best available scientific information but did not address the data sufficiency issue directly.

FOS certifications draw stock status information from a variety of sources, including FAO (often the 'Review of the state of world marine fishery resources' publication (FAO, 2005b)), Regional Fisheries Management Organisations (RFMOs), or national marine research authorities (NMRA). National and RFMO data are potentially relevant sources of information where quantitative stock assessments relate specifically to the stock under consideration. However, the FAO 'Review of the state of world marine fishery resources' (FAO, 2005b) provides a much more general overview of the 'state of exploitation' of different species or species groups, by FAO statistical area, and is therefore a much less precise source of information. Two specific problems arise with using this information in relation to the status of a particular stock: The first is that the data may be quite out-of-date (at least seven years). The second is that the FAO information often aggregates many stocks or sub-stocks, rather than providing information for individual stocks. The status of such separate stocks is often different, and a poor status of one stock

[24] Previously, the only requirements were that the organisation should be managed accordingly to its size and cultural context, operate following the precautionary principle and incorporate a monitoring and research process. Previously it did not require a specific assessment of whether the management system takes into account the state of the stock.

may be obscured by a generally satisfactory status of the species or species group over a larger area. Hence the information used does not necessarily give an accurate picture of the status of the particular stock under consideration[25]. FOS does not conduct any independent peer review of the stock status information or stock assessment information from these three sources (FAO, RFMO, NMRA).

Naturland capture fishery certification requires that the total stock be considered. For its only certification of a wild capture fishery to date, Naturland used stock assessment information from the Lake Victoria Fisheries Organization (LVFO), the body responsible for research, stock assessment and fisheries management of the lake. Within the specific indicators for the certification it stated that the stock must not be critically overfished. Naturland felt confident, based on the LVFO stock assessment, fishermen's monitoring and biological research, and given the artisanal nature of the fishery, that there was no risk of stock collapse. However, there is in fact no conclusive stock assessment for the lake and draft assessments undertaken under the EU-funded 'Implementation of a Fisheries Management Plan' project suggested that there is a risk of severe stock decline if fishing effort continues at the current pace or increases. However, the audit report for the fishery did not mention any issues related to stock sustainability.

MSC use the most recently available stock-specific assessment results directly from fishery managers and stock assessment scientists. MSC criteria require that the target population(s) and associated ecological community are maintained at high productivity relative to their potential productivity. The assessment of this considers outcome indicators (stock status, reference points and stock rebuilding) and harvest strategy indicators (the harvest strategy, control rules, monitoring and stock assessment procedures). The consideration of stock status includes a peer review of the stock assessment information.

The FAO guidelines, in accordance with the Code of Conduct for Responsible Fisheries, requires that the stock under consideration is 'not overfished, and is maintained at a level which promotes the objective of optimal utilisation and maintains its availability for present and future generations' (Article 30).

Both FOS and MSC claim to comply with this requirement. FOS criteria state that a fishery where the stock is classified as 'overfished, depleted, recovering or data-deficient' cannot be certified. However, in practice, overfished stocks may be certified for two reasons. Firstly, where FAO (2005b) state of exploitation is used as an indication of stock status, this does not allow discrimination of the state of exploitation of the particular stock under consideration for the audit. It is possible therefore, that a stock that is actually overfished is not identified as such purely based on reference to the FAO information source. Secondly, there is an exception to the requirement that the stock is not overfished for traditional fisheries which a) respect all other criteria; b) represent not more than 10% of the total catch of the overexploited stock; c) should be taken as a positive example of a well-managed low impact fishery and thus be promoted. These criteria were fulfilled in the case of the Indonesian trammel net shrimp fishery audit, which used this exception to certify the fishery, which operates on an overfished stock. In addition, the proportion of the total catch of the stock that the fishery represented was not verified.

The MSC standard does not explicitly define 'overfished' within its standard. However, the recently-updated Fisheries Assessment Methodology (FAM) requires the limit reference point in terms of biomass to be set above the level at which there is an appreciable risk of impairing reproductive capacity[26]. This is a generally-accepted understanding of the term 'overfished' and is commensurate

[25] FAO themselves state that the annotations on the status of resources provided in the publication should be interpreted with 'a degree of care' and used as 'rule of thumb' indicators only as they have 'limited statistical significance from a fisheries management point of view'.

[26] We note that prior to the introduction of the new FAM in July 2008, CBs were at liberty to place their own interpretation on the requirements with respect to limit and target reference points and some variation resulted.

with a biomass level that threatens the future viability[27] of the stock. A stock that is below its limit reference point would therefore be regarded as overfished and not eligible for MSC certification. A fishery that is above its limit reference point, but below its target reference point must show implementation of a rebuilding plan. If a fishery that is currently certified falls below its limit reference point, the certification would effectively be suspended (and the fishery would be expected to be closed anyway to enable the stock to recover).

MEL-Japan would certify an overfished stock if it was being managed under a recovery plan and there was progress toward stock recovery. In fact, the one fishery that has been certified by MEL-Japan to date fits this description. DEWHA would also grant approval for overfished stocks if the management system was capable of ensuring their recovery. Naturland's criteria established for the Lake Victoria Nile perch fishery do not allow the stock to be critically overfished, but as discussed above there is currently significant uncertainty over the status of the stock and analyses to date indicate a significant risk of overfishing.

Ecosystem impacts

Ecosystem impacts are covered under the general understanding that fishing must take place in a manner that mitigates potential impacts on the wider ecosystem. All relate only to the impacts of the fishing activity itself, and not the wider potential impacts of processing, transport of products etc., although FOS requires companies to assess their products' carbon footprint within 12 months of certification, and offset carbon production by 20% every year or reduce total energy consumption by 20% per year. However, this has not been easy to implement in practice[28].

In addressing potential impacts, MSC and DEWHA consider the most serious potential impacts and require management responses that address these impacts. In the case of the MSC, there are requirements for management responses and/or research that demonstrably address the impacts that are likely to have the most serious consequences for the target stock and the ecosystem on which it depends. The assessment of impacts includes outcome, management strategy and information indicators for retained species, bycatch species, endangered, threatened and protected (ETP) species, and habitats and ecosystems.

FOS and Naturland assess specific issues related to the wider ecosystem on a 'pass/fail' basis. For example, FOS assesses impacts on the seabed; implementation of marine reserves; potential impacts on sensitive areas or habitats; threats to biodiversity, productivity and structure and function of the ecosystem; ETP species; predator-prey relationships; selectivity/bycatch; fuel efficiency and carbon footprint; and waste management. Naturland prohibits a number of activities that have detrimental ecological impacts, such as the use of poisons or explosives (use of these techniques also automatically puts a fishery outside the scope of an MSC assessment, to the extent that it is not even part of the scoring indicators). In the Nile perch criteria, banned gear were identified and included monofilament gillnets, mesh sizes below 5 inches, beach seines and trawl nets amongst other things.

[27] Refers to various types of viability including ecological and commercial.

[28] Guidance for the calculation of carbon footprint is not specified (e.g. how to set the boundaries). A recent review indicated that where criteria are only a recommendation, they are not undertaken, and where criteria are essential, there was a planned commitment, but that was not met (Andre, 2009).

Table 6 Summary assessment of certification standards against the minimum substantive requirements for FAO Guidelines for the ecolabelling of fish and fishery products from marine capture fisheries.

	Management system	State of the stock	Ecosystem impacts
FOS	Includes management system (e.g. fishery follows advice of scientific advisory bodies, has an adaptive management plan, makes data available for scientific monitoring and fishery management), but does not assess whether the data collected by the management system are sufficient for scientific monitoring. Includes precautionary principle.	Stock may not be overfished, depleted, recovering or data deficient according to most recent stock assessment by FAO, RFMO or NMRA; however, will certify overfished stocks in certain circumstances (see text); not independently reviewed as part of the certification process. 'Stock assessment' used does not always relate to the stock under consideration, especially where taken from FAO (2005b), and can also be out of date (up to 6 years). Other data sources (RFMO, NMRA) better, where available/used.	Assesses against specific criteria e.g. impacts on seabed, sensitive habitats, biodiversity, ecosystem, ETP species, predator-prey relationships, selectivity/bycatch, fuel efficiency and carbon footprint. References cited do not always relate to the specific fishery being assessed.
MSC	Includes assessment of the management system, its effectiveness and implementation. Only scheme that specifically requires the data and information to be sufficient for achieving the other objectives (stock status and ecosystem impacts). Includes precautionary principle.	Uses stock assessment data specific to the stock under consideration. Reference point must be set above the level at which there is an appreciable risk of impairing future viability of the stock. Will not certify a stock below limit reference point ('overfished'). If stock is below target reference point and has not been consistently fluctuating around it, a recovery plan should be in place. Stock assessment data are peer-reviewed.	Considers potential direct impacts in the categories of retained species, bycatch species, endangered, threatened or protected species, habitats, plus any additional indirect impacts on the ecosystem; requires management responses that address significant impacts.
MEL-Japan	Requires there to be an 'effective' management system but does not provide further details; instead, specific guidelines are developed by the certification body on a case-by-case basis. Does not include precautionary principle.	Target resource is maintained at the 'level of sustainable use', although this is not explicitly defined. Uses data used in Japan's national stock assessments, not independently reviewed as part of the certification process. Data relatively up-to-date (2 years). Would certify overfished stocks if managed under a recovery plan and showing progress towards stock recovery.	Requires that 'appropriate measures should be taken for the conservation of the ecosystem', against the 'most probable adverse impacts'.
Naturland	Includes management system; detailed requirements set for each fishery. Requires data to be collected but does not mention requirement for a full stock assessment or actions to maintain sustainability of the stock based on scientific data. Does not include precautionary principle.	Use stock assessment results from local research agency. Not independently reviewed as part of the certification process.	Assess against specific criteria e.g. no use of poisons or explosives. Also develop specific criteria for individual assessments.
DEWHA	Includes assessment of the management system, its effectiveness and implementation. Includes precautionary principle.	Uses stock assessment data specific to the stock under consideration. Would certify an overfished stock if the management system was considered capable of ensuring recovery.	Considers most serious potential impacts and requires management responses that address those impacts.

3.3.2.2. Certification of aquaculture operations

In contrast to fisheries, schemes covering aquaculture generally have specific standards for different species (e.g. Naturland has standards for carp, trout, salmon & char, mussels, shrimp, cod, seabream, croakers/drums). GAA is mainly focussed on shrimp, and FOS includes some species-specific criteria but does not have separate standards for different aquaculture species.

The draft FAO aquaculture certification guidelines cover four main areas: animal health and welfare; food safety and quality; environmental integrity; and social responsibility. The schemes address these aspects to different extents (Table 7). It should be borne in mind that the FAO aquaculture certification guidelines have not yet been agreed, partly due to concerns over their scope and whether all four areas should be compulsory, or whether certification schemes should be able to pick and choose between the four areas. The issue is not yet resolved, but aquaculture certification schemes may not be expected to address all four areas specified in the guidelines.

Animal health and welfare

All the aquaculture labels include some measures relating to animal health and welfare, although to differing degrees between schemes and between species. GAA includes animal health and welfare issues related to tilapia and catfish, but not in relation to shrimp (this is in line with current crustacean welfare standards at OIE level). GlobalGAP requires that fish are at all times treated in such a way as to protect them from pain, stress, injury and disease. FOS includes measures in relation to disease prevention but not in relation to minimising stress, as it considers such animal welfare aspects to be beyond the remit of a sustainability label. Naturland requires that animals must be able to behave in a natural way.

All the schemes include disease prevention measures and include mention of the use of drugs, although the details vary: GlobalGAP requires drugs to be used only in accordance with applicable regulations; FOS requires drugs and chemicals to be used only when clearly justified but does not mention the use of only approved substances; Naturland has the most strict criteria (as would be expected of an organic label), not allowing any hormones or chemo-synthetic drugs, preferring natural curative methods, permitting conventional medicine only after veterinary advice, and requiring twice the legal waiting time before harvest after use of the drugs.

The schemes do not cover the ‘special needs of polyculture’ as required in the FAO guidelines. Naturland mentions it in relation to its possible benefits, and FOS mentions ‘integrated aquaculture (different species)’ as a possible measure for mitigating pollution by offshore cages.

Food safety and quality

GlobalGAP, GAA and TQS cover food safety and quality most comprehensively, as might be expected for private sector standards and national standards focused on the export market, which requires food safety and quality standards to be met as a minimum. Other schemes, such as FOS, consider such aspects to be beyond the scope of an ecolabel, since they are covered by other international health and trade standards. Despite this, FOS and Naturland do cover indirectly some aspects of food safety and quality, such as within their health and hygiene aspects (e.g. in FOS, choice of adequate sites to avoid disease and pest problems).

Other aspects of food safety and quality mentioned in the FAO guidelines (e.g. location to reduce the risk of contamination and pollution, monitoring of hazards (e.g. microbiological) and risks, avoidance of feed contamination) are only mentioned in relation to their potential environmental impacts in these schemes (e.g. siting of farms to minimise environmental impacts, monitoring of water effluents, feed produced in accordance with organic standards or reduced use of fish meal), rather than in relation to

the potential risks for human health (i.e. siting of farms to avoid contamination of the animals, monitoring of water inputs to ensure quality and lack of microbiological infection). However, Naturland, as with GlobalGAP, GAA and TQS, does require a chill/cold chain to be maintained and that the cleaning regime ensures hygiene.

Environmental integrity

All the schemes include environmental integrity issues. Naturland and FOS have specific criteria for the particular environmental issues of most concern to them. Others such as GlobalGAP and GAA require potential environmental impacts to be identified and monitoring to be carried out. However, GlobalGAP does not specifically mention any requirement for mitigation of impacts. Not all the schemes specifically require an Environmental Impact Assessment (EIA) to be carried out, although most require environmental impacts to be identified and monitored. All schemes include criteria requiring: the responsible use of water (efficient extraction and use) and responsible effluent management; responsible use of seed (minimise dependency on, or banning the use of, wild seed); responsible use of non-native species and minimisation of escapees; use of feeds (GlobalGAP and GAA feed requirements relate to hygiene and contamination; FOS and Naturland feed requirements relate to minimising the environmental impacts of the source and wastage of feed e.g. reducing the use of fish meal). Most schemes include requirements to reduce energy consumption (except GAA).

Social issues

All the schemes applying to aquaculture included social criteria of some sort. GlobalGAP has an optional social annex in its criteria for shrimp; GAA has a code of practice for community and employee relations. All include labour rights issues of workers, such as no forced labour in line with ILO conventions, the freedom to associate, no child labour (although Naturland allows children to work on family or neighbours' farms subject to certain requirements), and all require wages to meet the national legal minimum standard. Most schemes include provisions to facilitate the participation of small-scale producers: GlobalGAP allows for group certification for small-scale farmers; Naturland has worked with GTZ to promote certification of small-scale producers; FOS does not have any specific measures but the relatively low cost of certification facilitates access to the scheme for small-scale producers or cooperatives. Most schemes do not mention development among rural communities specifically, but several do require that local communities' access to water resources (e.g. fresh water and fishing grounds) is maintained (FOS and Naturland). GlobalGAP requires a grievance procedure for any affected communities and compensation paid for any impacts. None of the schemes explicitly mentions gender or inter-generation issues.

Table 7 Summary assessment of certification standards against the minimum substantive requirements in the draft FAO Technical Guidelines on Aquaculture Certification

	Animal health and welfare	Food safety and quality	Environmental integrity	Social issues
GlobalGAP	Yes, fish must be treated in such a way as to protect from pain, stress, injury and disease. Drugs to be used only in accordance with applicable regulations.	Yes, prevention of water contamination, requirement for a food quality manual and written hygiene plan, effective waste management, location of facilities must ensure safe production of food, feed quality and contamination controls, hygiene standard based on HACCP.	Potential environmental impacts must be identified and monitoring carried out. However, does not mention requirement for mitigation of impacts. Requires action plan to prevent contamination/ salinisation of water. Restrictions on wild seed. Minimise escapees. EIA required.	Shrimp standard includes an optional social standard. Worker health and safety, no forced labour, freedom to associate, wages must meet legal or industry minimum. Group certification option for small-scale producers.
GAA	Yes, for tilapia and catfish (operations have animal welfare in mind, harvesting and transport to minimise stress), but not included for shrimp (in line with current OIE welfare recommendations).	Yes, including food safety for harvest and transport, drug and chemical management, microbial sanitation, location of facilities must ensure safe production of food, feed quality and contamination controls, hygiene standards.	Includes identification of potential environmental impacts, siting of farms not to displace important natural habitats, effluents monitored for water quality parameters, minimise escapees, responsible use of wild seed.	Includes (voluntary) code of practice for community and employee relations for shrimp farming. Not block access to public areas. Worker safety, comply with national labour laws, pay minimum wage.
FOS	Does not include animal health and welfare (e.g. minimising stress), considered beyond the remit of a sustainability label. Does include disease prevention measures. Drugs and chemicals to be used only when clearly justified, but does not mention only approved substances.	No, considered beyond the scope of an ecolabel. Some aspects covered indirectly e.g. choice of adequate sites to avoid disease and pest problems.	Specific criteria for environmental issues of most concern e.g. infrastructure to minimise escapees, minimise use of wild broodstock, minimise pollution, water quality of effluents, EIA required.	Included. No child labour, no forced labour, wages meet national minimum legal standard. Communities continue to have access to fishing grounds and fresh water.
Naturland	Yes, animals must be able to behave in a natural way. No hormones or chemo-synthetic drugs to be used, natural curative methods preferred. Conventional medicine only permitted after veterinary advice, must wait twice the legal time before harvest after drug use.	No, although does require a cold chain is maintained and that the cleaning regime ensures hygiene.	Specific criteria for environmental issues of most concern e.g. siting of farm, prevent risk of escapees, local species preferred, water quality of waste water, wild seed collection must be in line with CCRF, minimise feed wastage and reduce use of fishmeal. EIA not required but criteria cover many EIA aspects.	Included, no forced labour, freedom to associate, no child labour but children can work on family or neighbours' farms subject to conditions, wages must meet national minimum wage. Basic benefits must be covered e.g. maternity, sickness, retirement. Fishers' access to natural water courses maintained.
TQS	Yes, assessed indirectly through checks for medication and prophylaxis residues.	Yes, includes location of facilities with respect to food safety, general good hygiene, feed contamination avoidance, carry-over of potential hazards to human health. Scheme is focussed on meeting US, EU and Japan import requirements. Includes HACCP.	Yes, except does not require EIA to have been carried out. Details of environmental requirements not provided by DOF.	Includes labour rights e.g. no forced labour, wages must meet national minimum legal standard. ILO convention issues such as child labour, forced labour, are not included in the scheme, but are dealt with by other departments.

3.3.3. Assessing compliance with the standard

3.3.3.1. Accreditation of certifying bodies

Few certification schemes fully comply with the FAO guidelines on the use of independent accreditation bodies (ABs) to carry out accreditation of certification bodies (see Table 3), although there is a trend towards greater independence. MSC has an independent AB, and FOS has recently established its accreditation procedure involving independent ABs. The other schemes reviewed do not have independent accreditation (Naturland has an accreditation system, but it is a general accreditation to ISO65, not to a specific Naturland accreditation standard).

Accreditation of MSC's third party certification bodies is carried out by a single independent accreditation body, Accreditation Services International (ASI). Previously, accreditation was undertaken internally by the MSC. The function separated from MSC in 2006 and was transferred to ASI under contract. At present MSC have eight fully-accredited independent certification bodies for fishery assessments and six more that are undergoing accreditation, but are at an advanced stage and can therefore also carry out fisheries assessments. There are seventeen certification bodies accredited for chain of custody assessments and a further two undergoing accreditation that can undertake assessments.

FOS is also a third-party certification scheme and has recently (June 2009) had its accreditation procedure approved by European Cooperation for Accreditation (EA). As such, the national accreditation bodies in individual Member States will carry out accreditations of certification bodies based on the FOS procedures. This replaces the previous system where there was no established accreditation system or accreditation body, and four certification bodies were used to conduct assessments. MEL-Japan does not have an independent accreditation body; instead MEL-Japan accredits certification bodies itself. To date there is only one certification body for MEL-Japan: the Japan Marine Resources Protection Committee.

GlobalGAP has a similar system to FOS, with a number of accreditation bodies that can accredit certification bodies. Accreditation bodies must have signed a Memorandum of Understanding with GlobalGAP, and be members of EA and the International Accreditation Forum (IAF). For Naturland, certification bodies must be accredited to ISO65, and can use any appropriate accreditation body to assess this. Naturland does not have its own procedure for accrediting certification bodies, instead accepting any ISO65-accredited certification body. GAA does not have an accreditation body for accrediting certification bodies. Instead, a single nongovernmental body, the Aquaculture Certification Council (ACC) is the only certification body and carries out the certifications on behalf of GAA.

National schemes tend not to have third-party arrangements, instead carrying out their own assessments against their standards. This may be more cost-effective than using third-party certifiers, but may also be less credible because of the links that governments have with producers and their interest in having many certified enterprises.

3.3.3.2. Certification procedure

The key role of the certifying bodies is to gather and assess information necessary to assess performance relative to the certification standard. The types of information used in this regard are discussed in Section **Error! Reference source not found.**.

In all reviewed certification schemes, compliance of a fishery or aquaculture operation with the certification standard is verified through audits. Most schemes use independent certification bodies to carry out the audits, the exceptions being the national standards. The case of the GAA is illustrative of a

trend towards greater independence in certification arrangements. To date GAA's certification standard (BAP) has been certified by the ACC (created and licensed by the GAA), but in 2009 the ACC's role is being changed from a certification agency into a BAP programme manager; the role of certification will be delegated to fully independent, ISO 65-accredited certification bodies.

The frequency of re-certification required by the certification schemes conforms to FAO guidelines — at least every three years for aquaculture, and every five years for fisheries, with interim audits. Most schemes use a combination of site visits for inspection against specific criteria, and review other supplied documentation, such as on stock status for capture fisheries.

The schemes differ in the transparency of the certification procedures. MSC recommends a confidential pre-assessment phase, in which an initial assessment is carried out of how likely the subject fishery (the unit of certification) would be to achieve certification under a full assessment. However, the full certification procedure is open and transparent; all documents and reports are available on the MSC website during the certification, and there is a clear procedure for stakeholder input at various stages in the process, including the final report and certification decision. MSC chain of custody audit reports, however, are regarded as commercially confidential and are not available. About two-thirds of the FOS fishery and aquaculture audit reports are available on the FOS website. All reports should be made available to allow ready access to information and assessment of compliance with stated certification procedures. Similar to MSC, full chain of custody reports are also confidential, although sometimes limited information is provided in the publically-available audit report. MEL-Japan has not published the full final assessment report for the one fishery that has been certified so far. The initial report was published for comment — one letter containing three comments was received and the report was subsequently updated, but only a summarised version of the revised report has been made public.

3.3.3.3. Consultation and stakeholder input

The FAO guidelines have quite specific requirements for stakeholder input into the setting of standards. For fisheries, a comment period of at least 60 days is required following publication of draft standards. MSC and GlobalGAP have stakeholder consultation periods to ensure participation and transparency in standard setting. The national standards (TQS and DEWHA) also included stakeholder consultation during the drafting phase. In the case of TQS, this included processing plants, clubs, associations and consumers. In the case of DEWHA, the draft guidelines were the subject of considerable consultation with fisheries agencies and other stakeholders. MEL-Japan's standards are set by the Technical Committee, but the rules of procedure for standard setting are not published and the composition of the Technical Committee is not published on the website, although the information may be available upon request. The FOS standard is set and modified by their Technical Committee; to participate in standard-setting interested parties must become members of the Technical Committee as there is no other opportunity for public comment. While this meets the requirement in the FAO Guidelines for an appropriate consultation forum it does not address the notification provisions described above.

With respect to the certification itself, there is generally more opportunity for stakeholder input and comment on capture fisheries certifications than for aquaculture, mainly as a result of the public nature of fisheries resources, compared to the more private nature of aquaculture production units. Neither GlobalGAP's nor Naturland's aquaculture certifications include active consultation of stakeholders during the process.

The FAO guidelines require certification schemes to include a written a policy applicable to certifying bodies for dealing with complaints (including objections) received from interested parties in relation to certification decisions. In the case of MSC, there are opportunities for consultation throughout each fishery certification. MSC's membership of ISEAL requires an acceptable level of involvement of stakeholders. There is also a detailed and well-established objections procedure, which provides a mechanism for any disagreement with the assessment of the fishery to be resolved. If the objection

cannot be informally settled, an Independent Adjudicator reviews the objection, which requires the objector to pay a fee.

The FOS certification processes for both fisheries and aquaculture did not previously include active consultation of stakeholders. An objections procedure was available, post-certification, for stakeholders who disagreed with the certification decision, which required the objector to pay the costs of the objections committee to investigate and mediate the objection. However, during the course of this review, a number of changes were introduced, particularly during May and June 2009. Firstly, a 14-day period was introduced for objections to be raised prior to the certification decision. After the audit is completed, the audit report is published on the website and stakeholders may raise objections through the objections procedure outlined above. An opportunity for stakeholder comments on the certification during the audit period (i.e. before the audit report is completed and published) has also been introduced subsequently. This provides a no-cost opportunity for issues to be raised during the certification process with the certification body, who should take into account comments (with evidence) received. The value of this opportunity for stakeholder input is somewhat reduced, however, because very little information on the fisheries under audit is available on which stakeholders can base their comments[29]. Stakeholders' input could be more effectively facilitated if FOS were to publish preliminary information regarding the fishery or aquaculture operation applying for certification.

In the case of their one certification to date, MEL-Japan allowed a two-and-a-half week period for stakeholder comments on assessment reports, and also an objections procedure. Naturland provides a 4-week period for stakeholder comments on the inspection report prior to the certification decision. DEWHA also provides a period for public comment.

3.3.4. Developing countries

Despite the predominantly global and non-discriminatory intentions of certification schemes, certification is harder to achieve for products coming from developing country fisheries and aquaculture operations. Production systems in developing countries are often small scale, resulting in a range of difficulties with respect to certification. The relative cost of the assessment process to these systems is often higher because the same standard is applied in all cases, irrespective of their size and profitability. Potential benefits of certification such as improved market access and price premium are also less readily realised, because export pathways are less well established. Developing country production systems are also more likely to be data-poor, making the assessment process more problematic. Certification schemes may therefore unintentionally favour products from developed countries.

In practice, the certification schemes have different levels of penetration in developing countries. FOS has a relatively even penetration across developed and developing countries..This is generally attributed to its low audit costs and use of certification criteria that are achievable by developing country fisheries (see below). MSC-certified fisheries are predominantly located in developed countries and few fisheries in developing countries have yet been certified. This has been attributed the high demands put on fisheries seeking MSC certification in terms of information provision, management of the fishery and development of sophisticated harvest strategy procedures. Not only is the certification process often quite intrusive and therefore relatively more expensive, but in the past, the types of data collection, analysis and management procedures required to meet the MSC standard have been largely beyond the capacity of developing country fisheries. However, MSC has recently been adapting its certification process to enable use of less data-intensive risk-based tools that are more applicable to the scope and context of small-scale and developing country fisheries, thereby enabling those fisheries to achieve

[29] For example, currently under audit are 'Scottish Mussels Growers', 'Sri Lanka Tuna Longlines', 'Morocco Purse Seined Sardines and Mackerel', 'Morocco Purse Seined Anchovies' and 'Argentina Purse Seined Anchovies', without further background information on the fishery or initial analysis. Stakeholders input could be more effectively facilitated by publishing the preliminary information form submitted to FOS as part of the application for certification.

certification without having to implement expensive data collection and stock assessment programmes (see also Section 3.3.5).

The relatively low audit cost of FOS compared to MSC is a significant advantage in the developing country context, and the greater penetration of this scheme in this area is to be welcomed. However, this lower cost is primarily due to the significantly lower level of information required to achieve the certification standard compared to the MSC as described in Sections 3.3.2.1 and 3.3.5. This introduces a significant risk of undermining the certification standard, and hence the credibility of the label, not just for developing countries, but across all certifications.

MEL-Japan so far has only been applied to Japanese fisheries therefore its potential applicability to developing country fisheries is not known, but given its focus on providing certification procedures for fisheries under Japanese management, it is unlikely that it will be applied in other countries in the near future.

In the case of aquaculture standards, the needs of developing countries already seem to be quite well addressed, particularly since many aquaculture operations are based in developing countries. GlobalGAP's farms are mainly in Norway, Scotland and Chile. GlobalGAP has three approaches to facilitate developing country involvement: group certification which allows a number of smallholders to share the cost of certification; a small-holder manual to support the development of internal control systems; and encouraging feedback from developing countries. 71% of certified farms fall under group certification, indicating high penetration in smallholder aquaculture.

GAA mainly applies to farms in south-east Asia, China, Latin America and a few in the USA. The GAA and ACC have implemented an Integrated Operating Module, which aims to help small-scale producers become certified in less developed countries such as Thailand. This is achieved by forming clusters of small producers giving them the opportunity to pool resources and achieve certification. These clusters are aided by funding from processing companies, as they have a vested interest in sourcing certified product to meet the demands of supermarket clients such as Wal-Mart in the US.

Naturland's aquaculture producers are based in SE Asia, Latin America and Europe. Naturland has certified aquaculture operations in developing countries, particularly in Latin America (e.g. Ecuador, Peru, Brazil, Honduras, Chile) and south-east Asia (e.g. Vietnam, Thailand, Indonesia). TQS supports the export of shrimp from farms regardless of their size, including through the provision of free services (e.g. analysis, sampling and reporting).

3.3.5. Data-deficient fisheries

Data-deficiency issues only apply to fisheries certifications (not aquaculture). MEL-Japan does not have specific procedures for data-deficient fisheries as it is not considered to be an issue in Japan, but they assert that this could be handled under the existing system. FOS claim they will not certify data-deficient fisheries, but in practice the data used to complete a certification would probably be regarded as deficient under some other certification schemes, such as MSC. In one case, a fishery targeting *Metapenaeus ensis*, *Peneaus indicus*, and *P. monodon* shrimp in Indonesia was certified, even though the audit reported that *M. ensis* had 'no data available' on the state of exploitation.

MSC is incorporating a risk-assessment approach into its proprietary Fisheries Assessment Methodology (FAM) that enables data-deficient fisheries to be assessed to the same standard as other fisheries, noting that a precautionary approach to management is needed when the assessment of stock status and the impacts of fishing are more uncertain due to a lack of data (and the risk of unacceptable impacts occurring without being detected is therefore greater). The Risk Based Framework (RBF)[30]

[30] RBF Version 1, 6 February 2009.

developed by MSC provides a means by which a fishery's compliance with the MSC standard can still be assessed even in the absence of the kind of information that normally accompanies a traditional quantitative stock assessment. In essence, the RBF enables scoring of fisheries in data-deficient situations, particularly for the 'outcome' performance indicators associated with the stock under consideration and ecosystem impacts principles. This has been developed to be in line with the FAO guidelines[31]. MSC emphasise in guidance to their certification bodies that when data are deficient, more precautionary (i.e. more risk averse) management is required to achieve certification, and the RBF is not an easier option with less rigor than the existing standard.

Naturland does not have a specific methodology for data-deficient fisheries, but instead develops separate standards applicable to each specific fishery. Although the Lake Victoria Nile perch fishery certified by Naturland is not data-deficient compared to some, it does not have an agreed stock assessment. Australia's DEWHA does not have specific arrangements in place for data-deficient fisheries, but government assessments of commercial fisheries adopt a continuous improvement model, designed to improve management arrangements over time, and conditions imposed may include the acquisition of better data about the fishery. They also take a precautionary approach – for fisheries where information is less robust, export approval may be granted for a shorter time and more conditions imposed.

3.3.6. Budgets and funding sources[32]

Funding for the independent certification schemes tends to come from a mix of their own income (e.g. from royalties and membership fees) and grants (Table 8). The national schemes are fully funded by government budgets. The annual budgets of the ecolabelling schemes vary from €22,500 (for MEL-Japan) to €4 million (for MSC). In the case of FOS, MSC and MEL-Japan, the entire budget is directed at supporting the ecolabelling scheme, the main activity of the organisation. For those organisations that develop standards for a range of other products (Naturland and GlobalGAP), only a proportion of their overall budget would be dedicated to seafood certification.

Table 8 Budgets and funding sources of fisheries and aquaculture Certification schemes

	FOS	MSC	MEL-Japan	Naturland	GlobalGAP	GAA
Annual budget	€600,000 (annual budget)	€4 million (expenditure) ('07-'08)	€22,500	€1.5–2 million (turnover)	€2 million	Not available
Approx. % of budget spent on the scheme	100%	100%	100%	Fisheries and aquaculture are only a small part of certification scheme	Majority	Not available
Sources of funding	Payments for audits and using the logo; EU funding; private sponsors	Logo licensing (12-38%)[33]; donations (e.g. Walton Foundation, Packard Foundation)	JFA and member companies; accreditation and registration fees	Membership fees	Members' fees	Private sector

31 In paragraph 32, the FAO guidelines state: "…the use of less elaborate methods for assessment of stocks should not preclude fisheries from possible certification for ecolabelling". It goes on to note "...to the extent that the application of such methods results in greater uncertainty about the state of the 'stock under consideration', more precautionary approaches to managing such resources will be required which may necessitate lower levels of utilization of the resource".

32 Cost of certification is covered in section 3.5.1.3

33 12% of revenues in '07-'08 financial year (MSC, 2008), and 38% in '08-'09 financial year (*pers. comm.,* MSC).

3.4. Recommendation lists

3.4.1. Organisation and participation

The lists included in this section are those developed by: Australian Marine Conservation Society (AMCS); Greenpeace; Marine Conservation Society UK (MCS UK); Monterey Bay Aquarium's Seafood Watch; NOAA Fisheries' 'FishWatch'[34]; the North Sea Foundation's programme 'Goede VIS'[35]; Sustainable Fisheries Partnership (SFP); and the World Wildlife Fund for Nature (WWF). Most of these organisations are NGOs and some are involved in a wide range of campaigning initiatives within and beyond the marine and fisheries realm. For many of them, preparation of a seafood recommendation list is part of a larger marine conservation strategy. For example, Greenpeace state that the long-term goal for their marine campaign is for 40% of the oceans to be designated as marine protected areas (MPAs) and the other 60% to have sustainable fisheries. Accordingly Greenpeace's scoring criteria for fisheries include whether MPAs have been established for the fishery. MBA, MCS UK and AMCS are all involved with other marine environmental issues including climate change and pollution. MCS UK states that their fisheries consumer advice programme is '*a leveraged campaign that seeks to create greater environmental sustainability in the way society uses the oceans fishery resources*'[36]. Similarly, the objective of the MBA seafood programme is to drive a shift in the seafood market towards sustainable seafood. FishWatch and SFP by contrast are both primarily focused on fisheries and seafood, particularly for improvements in management and conservation of marine resources. SFP is wholly focussed on this activity and does not carry out broader environmental advocacy work.

In addition to preparing lists, some of these organisations, including SFP and WWF, provide strategic and technical guidance to businesses. SFP is more directly involved in the supply chain than other organisations, aiming to inform buyers, and thereby influence supplier behaviour and catalyse or encourage fisheries improvement projects. Greenpeace has taken a multi-pronged approach by: applying pressure to retailers in their seafood campaign (start 2005); publishing a 'blacklist' of operators and companies; and involving restaurants to encourage the food service sector to move towards sustainable sourcing. These are all important aspects of raising overall awareness of sustainable fisheries and aquaculture and bringing such issues to the fore.

Unlike certification schemes, fisheries and aquaculture operations do not chose to participate in a list. The creators of the lists decide which products to cover and participation in a list is not generally at the discretion those involved in the fisheries and aquaculture operations from which those products originate. In principle, the recommendation lists are inclusive and applicable to all species and there are no limits to the number of species that can be assessed. However, products are selected by the list owners, usually because they have a high consumer profile and represent important targets for influencing consumer choices. These targets vary nationally and regionally, depending on market supply and consumer preferences, hence the content of the lists differs from country to country. Greenpeace and WWG each produce a range of national lists; Goede VIS, SFP, NOAA, AMCS also cater for regional markets, and MBA produces five different lists for regions within the US.

Lists are usually available through a website as an electronic resource or as published documents, which can be ordered or may be distributed through specific outlets. Many of them also have links to published and fully referenced articles for more detailed reading.

3.4.2. Content of the recommendation lists

Table 9 describes the type of information source provided by each of the organisations covered in this review. Rather than certifying specific products for client fisheries and aquaculture organisations, the

[34] Referred to in this report as NOAA FishWatch.
[35] Referred to herein as Goede VIS.
[36] See MCS strategy 'Seas fit for Life'.

strategy is a more general provision of advice and guidance regarding what types of fish to buy and eat, and also what types of fish to avoid because they are considered to be unsustainable. The information is generally simple and straightforward with minimal detail provided on the list itself. It is provided at a relatively aggregated level, for example by species or even family level. Sometimes they include details on individual stocks, geographical region, or fishing method and gear type.

The lists vary in content. For instance Greenpeace focus their list exclusively on species to avoid because they consider them to be threatened, overfished or fished using unsustainable methods. Others provide alternative 'sustainable' choices to those that they have listed as 'do not eat'. NOAA FishWatch does not provide specific recommendations on whether to eat certain fish or not, but it does present the available information on stock sustainability to enable consumers to make their own informed choice. MCS UK, AMCS and WWF use a traffic light system to illustrate the level of sustainability of named species/stocks.

Table 9 Description of the type of information provided by each organisation

Organisation	Information source
AMCS	Sustainable seafood 3-step pocket guide, and an expanded edition. Traffic light system pamphlets offered. Only available through purchase.
Greenpeace	Provide an international 'Redlist', and some national lists tailored to specific markets, online.
MBA	Seafood Watch programme, offer pocket guides for 6 locations in the US plus a sushi guide.
MCS UK	1) Pocket good fish guide; Traffic light system pamphlets offered. 2) Fishonline website; traffic light categorisation, detailed information and assessment of fisheries.
NOAA	Online advice via FishWatch website giving details of the fisheries.
NSF - Goede VIS	Online and printed wallet guide to sustainable seafood using traffic light system, called *"VISwijzer".*
SFP	Direct advice to businesses and online advice through FishSource website giving details of various fisheries.
WWF	Sustainable Seafood: consumer guides. Traffic light system pamphlets offered. International methodology.

3.4.3. Methodologies for compiling the lists

Most of the organisations have developed their own methodology to assess and categorise fisheries and aquaculture products as being sustainable or not, which is then presented in their seafood recommendation lists or guides. The exceptions are NOAA and SFP which do not operate criteria-based scoring systems, nor provide specific recommendations on what to eat, but instead just provide information on stock status, environmental impacts etc., for the reader to act on as appropriate. None of these organisations grant labels, develop certification standards or conduct audits for product chain of custody.

3.4.3.1. Applicability of the FAO guidelines to recommendation lists

The FAO guidelines are intended for ecolabelling and certification schemes; there are no equivalent guidelines specifically for recommendation lists. Nevertheless, the guidelines have significant relevance for recommendation lists, particularly with respect to aspects of best practice such as transparency, independence and stakeholder consultation. The minimum substantive requirements are also applicable, because lists provide assessments of sustainability. However, since the lists provide broader species coverage and in general do not assess on a stock-by-stock basis, they present less detailed information on individual stocks than certification schemes. They also tend to conduct their assessments in-house; hence they do not meet the guidelines' requirements with respect to accreditation and certification procedures. Nevertheless, during the course of this review we noted an

increasing tendency of these schemes to seek better conformance with the guidelines. Table 10 and Table 11 summarise the current alignment of the recommendation lists with the FAO guidelines for fisheries and aquaculture respectively.

Generally we found that the main focus of the lists is environmental sustainability and their scoring methodologies are developed accordingly. Within their criteria for fisheries management systems, they included both the 'precautionary approaches' and the 'sustainable use of the stock under consideration'. There is also reference to the 'state of the stock' i.e. whether it is overfished and the probability of recovery; and the 'ecosystem impacts' i.e. whether they are assessed and if serious consequences are mitigated.

MCS UK indirectly covers social aspects by acknowledging when a fishery is considered to be vital to a local community, but as with the certification schemes, lists do not generally cover social issues for capture fisheries. The lists often note whether the product is wild-caught or from aquaculture and in the latter case whether it is organic, although this is not always specifically included. Waste discharge from aquaculture sites may also be included.

With respect to aquaculture operations, the recommendation lists focus more on environmental impacts, than animal health and welfare or food safety and quality, which generally need to be assessed at an individual farm-level. This again reflects the focus of the NGOs on healthy ecosystems with lack of coverage of health and welfare, food safety and social issues. The latter were either absent or referred to only indirectly. Food safety and quality was not covered at all and social responsibility was only covered by Greenpeace who ask for information regarding certain aspects of human rights. MBA addresses it implicitly.

Table 10 Summary assessment of recommendation lists against the minimum substantive requirements in the FAO Guidelines for the ecolabelling of fish and fishery products from marine capture fisheries

	Management system	State of the stock	Ecosystem impacts
Greenpeace	Assesses whether the system uses an ecosystem-based management approach. Do not cover compliance and the monitoring of the systems to applicable regulations and laws.	A stock is not considered sustainable if the stock levels cannot be maintained. Uses species vulnerability rating on 'Fishbase'.	Specifically asks if species are from "sensitive deep-water habitats". Red-lists a fishery if it uses destructive methods; high discards; catches a high % of juveniles; non-target species caught; ecosystem alteration; fully traceable back to boat.
Goede VIS	Methodology developed in-hand with WWF's 2008 methodology.	Methodology developed in-hand with WWF's 2008 methodology.	Methodology developed in-hand with WWF's 2008 methodology.
MBA	Includes whether the system uses independent scientific assessments; if it regularly collects and analyses stock data; assesses what level the systems set the quotas at i.e. recommended by scientists; if bycatch reduction plans are included; if the system address its impacts and include conservation measures; enforcement.	Vulnerability to fishing pressure e.g. maturity, behaviour; level of exploitation also in relation to MSY; occurrence of overfishing; degree of uncertainty; biomass (combination of these factors which leads to the classification category assigned to the fishery).	Considers the condition of the habitat without fishing impacts; quantity and consequences of bycatch; damage caused by the fishing method; resilience to disturbance.
MCS UK	Assess whether there are management plans; the measures within the system i.e. mesh size etc.; enforcement; precautionary approach.	Level of exploitation must be assessed, categorised depends on: if the fishery is MSC-certified (do not accept other schemes); mortality and biomass above precautionary levels; fishing pressure and vulnerability; IUCN listed.	Assesses the impacts of the fishing method.

	Management system	State of the stock	Ecosystem impacts
NOAA FishWatch*	Provides a summary of the management system, including management measures, management plans and transboundary issues. Refers readers to source documents for more details.	Provides a summary of the stock sustainability status, including biomass, whether it is overfished and whether overfishing is occurring. Refers readers to source documents for more details.	Includes brief information on ecosystem impacts as a result of the gears used (habitat impacts) and bycatch. Covers whether there are measures in place to address essential fish habitat issues.
SFP FishSource*	Provides information on quality of management, including stock assessment, scientific advice, manager's decisions and compliance.	Provides information on stock status, including whether reference points have been set, status and trends.	Provides information on environment and biodiversity including ETP species, bycatch species, habitat and marine reserves.
WWF	Rates the effectiveness against overfishing or destructive methods, fails a fishery if stock assessments are not factored in, scoring the fishery higher the more 'precautionary' it is. Asks if the system works for stock recovery and maintaining ecosystem integrity, and if it uses ecosystem-based management. Assesses the factors that the system considers i.e. monitoring. Does not address compliance and monitoring of the systems to regulations and laws.	Would not consider a fishery sustainable if it was over fished or if the spawning stock biomass is below precautionary levels. Asks for its vulnerability rating on 'Fishbase'. Considers whether the characteristics of the species make it vulnerable to fishing pressure.	Addresses the ecosystem with several questions covering: discards; % landed catch; fishing method damage; if the fishery has caused any changes to the ecosystem.

***** NOAA and SFP do not have a scoring system. SFP does have 'SFP's Metric Systems' which buyers can use to calculate which fish they can purchase to fit in with their sustainable sourcing schemes; this has not been assessed as part of this review.

NB. AMCS has not been included in the table because we were unable to obtain information about their scoring system.

Table 11 Summary assessment of recommendation lists against the minimum substantive requirements in the draft FAO Technical Guidelines on Aquaculture Certification

	Animal health & welfare	Food safety & quality	Environmental integrity	Social issues
Greenpeace	Not within their remit, do consider disease transfer to the wild.	Not covered.	Covers most environmental issues, sourcing from the wild, siting considerations in sensitive areas, feed.	Ask one question about issues of human rights abuses.
MBA	Not addressed explicitly although many are implicit in other criteria.	Not covered.	This is the focus of the assessment, includes use of marine resources, disease transfer, escapes, use of feed, pollution/habitat, and management.	Not addressed explicitly although some are implicit in other criteria.
MCS UK	Includes optimising welfare standards.	Not covered.	Covers environmental issues in depth, including siting of farms, sources of feed, minimising effects of marine pollutants, minimising ecosystem effects and environmental management.	Not covered.
NSF: Goede VIS	Not covered.	Not covered.	Includes: the production system (water, discharge & energy), siting, ecosystem effects, feed and management.	Not covered.
WWF	Only one question which asks if the system decreases the health of the fish at any stage.	Not covered.	This is the focus of the assessment, includes all of the main points and also disease transfer to the wild, depletion of water, land/sea alteration. GMO not addressed.	Not covered.

NB. NOAA and SFP do not cover aquaculture products.

3.4.3.2. Scoring systems

MCS UK, Greenpeace, MBA, Goede VIS and WWF have all developed their own scoring systems for assessing sustainability and making recommendations on which fish to eat or to avoid. Scoring systems are dynamic such that if an organisation's conservation policy expands, then criteria on other issues may be added. SFP and NOAA FishWatch present information on stock status, the management system and ecosystem impacts, but do not provide specific recommendations. In the case of NOAA FishWatch this is based on assessments undertaken by their own government stock assessment scientists. They do not conduct any categorisation or 'rating' of fisheries and do not allocate scores.

NGO scoring systems are generally developed in-house, although some have included stakeholder consultation. For example, in the case of the WWF-International methodology (in collaboration with NSF), to increase transparency and consistency, public consultation was incorporated into the development process. WWF reported that input was received from academia, scientists and organisations and changes were made in accordance with feedback. However, this did not apply to national scoring systems developed prior to the WWF-International methodology (2008), such as the methodology developed by WWF-Hong Kong.

Details of the scoring systems, where used, and the way in which the scores are converted into a sustainability rating are not usually publically available. Methods and criteria have been much less well documented compared to certification schemes. However, the need for accountability has been increasingly recognised and transparency has improved. Two organisations (MBA and Greenpeace) now provide online access to their methodologies. All but one of the organisations made their methodologies available for this review (the exception being AMCS), although those for MCS UK, AMCS, WWF and Goede VIS are still not publicly available.

The scoring system (and as a result the weighting given to certain issues) can have a significant impact on the potential outcome of the sustainability rating for individual fisheries. As described in Section 3.2.2, WWF, NSF, Greenpeace and MCS (UK) did undertake a collaborative effort to develop a single methodology for the assessment of capture fisheries, but ultimately this did not come together. Significant variation in methodologies has resulted. The following list provides a summary of available information:

- MCS UK weight the categories of their methodology into levels of importance, each category has several score options.
- Goede VIS scores from 0 to –2 for some criteria and from +3 to –4 for others.
- Greenpeace asks yes/no questions; any 'yes' answer will result in red-listing of the fishery or aquaculture operation.
- WWF scores its questions depending on their assigned weighting, many of the questions are scored from +2 to –2, others are scored between 0 and 1 and others are scored from +4 to –1. The WWF methodology was developed in collaboration with the North Sea Foundation (NSF)[37].

To promote consistency across their national offices, Greenpeace and WWF[38] have each developed a single methodology for the creation of all their guides. Previously, national offices were able to develop their own criteria and scoring systems, which resulted in inconsistencies in classifications between different national guides, some of these remain, but only in lists that are now essentially out of date. The common international methodologies are intended to resolve this problem, whilst still enabling the

[37] At the outset, this process included Greenpeace and MCS UK, with all four organisations originally hoping to develop a single methodology. Over time different goals and opinions became apparent and Greenpeace and MCS UK went in a different direction.

[38] WWF methodology developed 2008

national guides to focus on particular species that are popular in the local market. Greenpeace now has an international redlist and separate national ones. The species on the WWF national lists are practically the same.

3.4.3.3. Carrying out assessments

Most of the assessments used to compile recommendation lists are based on publically-available information sources such as ICES, Fishonline (MCS UK), Fishbase and IUCN (for threatened or endangered ratings). All of them claim to use the most up to date and reliable source to which they have access. Most of the organisations provide links to the other organisations' websites, and other sources are referenced.

To reduce the level of subjectivity and improve consistency, the assessment results are often cross-checked between organisations and checked by in-house experts. For example, for WWF and Goede VIS, assessments are carried out by either a member of NSF or WWF or an assessor that works closely with either organisation in an agreed assessment procedure. They use primary information for their assessments and must quote the source of information to ensure transparency. The assessments for Goede VIS are also conducted by a group of approved assessors, which are then cross-checked within the team to minimise subjectivity.

The Greenpeace and WWF assessments available on line contain references throughout[39], which is to be welcomed, although they are not readily available online but are available upon request. On the Greenpeace website, if a relatively out-of-date IUCN status is quoted then this is highlighted. The online resources of SFP, MCS UK, NOAA and MBA also include references. NOAA Fisheries clearly benefits from a substantial and well-reviewed governmental information base, including management plans and stock assessments.

Recommendation lists vary in the frequency with which assessments are updated. MCS UK, Greenpeace and NOAA all do periodic reviews for their online information services. SFP receives quarterly updates from NOAA and is under constant review through its readership[40]. WWF-International does not regularly update their guides; it is left up to the national offices as to whether a new revision will produced. MBA update their guides every six months and keep their online resource under constant review. MCS UK reviews their guide on an annual basis.

The updating of recommendation lists depends in part on the priorities of the list owner. In the case of environmental NGOs, if their campaign priorities change and the list is no longer considered to be a necessary part of their programme, then it may no longer be updated. This can result in out-of-date lists which no longer reflect the current status of the fishery or aquaculture product concerned. Out of date information can mislead consumers into thinking a fishery is sustainable when it no longer is, or alternatively may damage positive initiatives by industry if an improving fishery is still listed as unsustainable. Online guides have an advantage over published guides in that they can be updated regularly at very little cost (in terms of publication at least). However, for both online and printed guides, it is important for the publication date to be clearly stated. Printed guides should also provide a note to users that the status of fisheries is dynamic and to check for updates or to seek further information online.

3.4.3.4. Consultation and stakeholder input into recommendation lists

In general, the recommendation lists all provide for consultation, peer review and formal challenge, but to different degrees and in different ways. All of the list owners stated that they have received

[39] The WWF-Hong Kong assessments reviewed in this study contained no references, but these were not prepared according to the 2008 methodology developed by WWF-International.

[40] Anyone who visits FishSource is invited to rate the information provided and make comments; SFP has a Science Advisory Board to review information.

questions and reports of inaccuracies in their lists. In some cases the details were vague but in others evidence was provided of information being presented and re-evaluated as a result of stakeholder input, for example by Greenpeace and WWF. All the organisations reviewed (other than AMCS which did not provide any information on peer review) stated that they investigate the claims made to them about their information and if it prove to be correct then appropriate amendments are made. However, this information must be considered in the context of environmental NGO policy positions that may override any other considerations, such as the example of Greenpeace listing all products from bottom trawl fisheries as unsustainable on principle, despite some having been certified as sustainable by the MSC (see Section 3.2.2)

3.4.4. Developing countries

The inadvertent marginalisation of developing country fisheries that occurs with some certification schemes due to high cost of participation and the problems of data deficiency (see Section 3.3.4) should be less of an issue in the case of recommendation lists. The only reason products from developing country fisheries would not be included in a recommendation list is because the list owners chose to omit them. MCS UK, WWF and Greenpeace all stated that they make provisions for small-scale and developing world fisheries within their programmes. SFP indicated that they look at developing country fisheries on a case-by-case basis should the need arise. AMCS and NOAA FishWatch obviously focus only on Australian and US fisheries respectively.

3.4.5. Data-deficient fisheries

All of the recommendation lists include provisions for assessing data-deficient fisheries. NOAA and SFP state that they cater for data-deficient fisheries; all of the other organisations have previously assessed data-deficient fisheries and generally special provisions are made for them. For example, Greenpeace do not automatically red-list a fishery solely for being data-deficient because their methodology includes the philosophy of 'improve the rest' (i.e. fisheries that are not red listed but could do better) aiming to promote these fisheries to buyers, encouraging the fisheries towards providing data and improving their level of sustainability. Their general view is that data-deficient traditional fisheries often have a lower impact than larger-scale fisheries so they aim to encourage buyers to help them to provide data and to improve sustainability. In WWF's scheme a data-deficient fishery would score lower in the methodology due to the higher level of uncertainty in stock status. In common with Greenpeace, MCS UK does not automatically list data-deficient fisheries as 'Fish to avoid' rather they are assessed in their own right. Within the exploitation component of wild capture assessment they can either score level 3 (an equivalent to overfished) if they are 'completely data deficient' or a level 2 (equivalent to ICES assessed where one reference level (fishing mortality or biomass level) is above or below but near precautionary targets respectively) if stocks are not formally assessed but do not show signs of overfishing. The MBA use criteria with a tiered system that is designed to deal with various levels of information and is precautionary when data are lacking.

3.4.6. Budgets and funding sources

As the lists do not usually generate revenue directly[41], list owners fund them from various other sources, including: grants, fund raising and donations. Aside from public supporters, funding may also derive from trusts and foundations. Table 12 outlines the main sources of funding for each of the organisations and the budget, where the information is available. It was not possible to partition the amount of time each organisation spent on preparing their respective lists.

[41] Recommendation lists are generally provided free of charge, one exception being the AMCS who charge A$9.95 (€5.84) for their detailed seafood guide.

Table 12 Information on budgets and funding or recommendation lists by organisation

	Sources of funding	Budget (if known)
WWF	Donations are mostly from the national organisations. The next major contributors are Government & aid agencies; trusts and foundations; the public & corporations. The WWF-Hong Kong Seafood Guide project was supported by MFJebsen International, a Hong Kong-based venture capital fund, also public and corporate donations.	The budget for sustainable seafood work worldwide is dependent on the national offices' budget. The budget for the global sustainable seafood project was €1 million over 3 years; this includes coordination work and funding for several of the offices to develop their seafood guides.
Greenpeace	Greenpeace receives donations from public supporters, trusts and foundations. Greenpeace claims to not accept donations from companies, governments or political parties. Their finances are audited annually and the Annual Report is published on the website.	The operative budget of the consumer markets work at Greenpeace international is €150,000 in 2009. Additionally there is the Oak Foundation budget, which is mainly for marine campaign salaries: the total international staff for the project is 3 people.
MCS UK	MCS are a charity who survive on donations from the public, fundraising events and corporate sponsorship.	In 2008/09 £120,000 was spent on the fisheries programme (10 % of the total income). About 50% of this was spent on compiling fisheries & stock sustainability information, with the remainder directed towards fisheries policy development and mariculture work.
AMCS	No specific funding sources for the Guide are identified, however AMCS' conservation work is funded by their 'generous Sea Guardian supporters and by philanthropic organisations such as the Myer Foundation'.	N/A
MBA	Foundations, donors, Aquarium revenue.	US$1 Million
SFP	Principal funding for FishSource is from the David and Lucile Packard Foundation, and also received corporate sponsorship from McDonald's, FoodVest and others.	FishSource is currently 15% of the total budget (approx $500,000). They anticipate annual running costs of approximately US$1 million to US$1.5 million in future, as coverage increases.
Goede VIS	NSF is funded by several Dutch government agencies as well as charities and donations from individual supporters.	The current budget of Goede VIS is about €90,000 per year. About 10% of the staff budget (1.2 full-time equivalent positions) of the NSF are allocated to Goede VIS.
NOAA	Government funding.	N/A

Where significant support is provided by organisations that have their own strong marine conservation agendas, this may have the effect, or at least the appearance of the effect, of eroding the independence of the purchasing advice provided in the lists. This is of particular concern where there are commonly held policy positions that influence the advice on multiple lists, giving additional weight to what is, in effect, a subjective outcome. Members of the Deep Sea Conservation Coalition (DSCC[42]) for example, which include Greenpeace, the Australian Marine Conservation Society and Pew Charitable Trusts, share a similar stance on bottom trawling. The DSCC focuses its attention on bottom trawling on the high seas where fishing is less well regulated than in national waters[43]. However, Pew Charitable Trusts goes further in that one of their aims is 'securing permanent bans on bottom trawling and other destructive fishing practices in both national and international waters'.[44] Greenpeace automatically red-lists any fishery using demersal otter trawl, beam trawl, or dredge.

[42] www.savethehighseas.org

[43] From www.savethehighseas.org: the Deep Sea Conservation Coalition is calling on the United Nations General Assembly (UNGA) to adopt an immediate moratorium on deep-sea bottom trawl fishing on the high seas until legally-binding regimes for the effective conservation and management of fisheries and the protection of biodiversity on the high seas can be developed, implemented and enforced by the global community

[44] (http://www.pewtrusts.org/news_room_detail.aspx?id=50258)

To make these issues more transparent, it is recommended that funding arrangements and relationships that may potentially undermine the independence of the information in the recommendation lists should be publicly disclosed.

3.5. Stakeholder perspectives

3.5.1. Industry

3.5.1.1. Pressures and influences on industry

This section considers the industry's[45] perspective on certification schemes and recommendation lists. Most sectors of the fishing industry are increasingly aware of issues related to overfishing and ecological impacts, and for some time have been making efforts towards sustainability. This is related to a number of factors including brand reputation, a need to assure clients along the supply chain of the legality and sustainability of supplies, their own sustainability policies towards environmental responsibility and also the fact that a sustainable company requires a sustainable supply of fish.

NGO campaigns for sustainable seafood have increased the pressure on industry to act and source responsibly. Such campaigns often aim to influence both industry and consumer behaviour, through increasing consumer awareness about fisheries sustainability. For example, the seafood recommendation lists aim to influence consumer purchasing behaviour, Greenpeace have run campaigns about tinned tuna and applied pressure on supermarkets across Europe about their fish sourcing policies.

Although there is increasing awareness and demand (albeit still quite small) from consumers for sustainable seafood products (see section 3.5.3), most of the drive and initiative for improving sourcing policies has come from within the industry itself, particularly more recently, including the fishing sector, purchasers, processors and retailers. From the producers' point-of-view, adopting responsible fishing practices can help them get noticed by processors and retailers who are increasingly looking for sustainably and ethically sourced products, even if they do not carry a specific ecolabel, in order to maintain and protect their brand reputations.

Media campaigns can also have the effect of pushing producers towards certification schemes in order to maintain their reputation and market, particularly in the face of negative press concerning the wider fishery they are involved in. For example, the 'Take a Pass on Chilean Sea Bass', campaign was launched in early 2002 by the US NGO the National Environmental Trust. It aimed to convince consumers and chefs to boycott Patagonian toothfish (Chilean seabass) due to the excessive levels of illegal catches and incidental mortality of albatrosses in toothfish fisheries. The Government of South Georgia and South Sandwich Islands obtained MSC certification for the South Georgia toothfish fishery in 2004, having shown that in this fishery the stocks were being managed sustainably, illegal fishing had been eradicated and measures to reduce the incidental mortality of seabirds had been implemented by all the fishing boats in the fishery, reducing the number of seabirds killed to virtually zero[46]. This also highlights one of the potential problems of recommendation lists (which often classify toothfish on the redlist) — that some lack the necessary fine scale resolution for distinguishing well-managed stocks within a wider fishery classification. All fisheries for a species become tarred with the same brush, and those that are sustainable have to absorb the costs of independent certification in order to demonstrate and benefit from their environmental and sustainability credentials. It should be noted that some recommendation lists do highlight exceptions and provide more fishery- or stock-specific advice, such as the MCS UK recommendation list.

[45] Industry is taken to include the fishing industry, processors, importers and wholesalers.

46 http://www.msc.org/track-a-fishery/certified/south-atlantic-indian-ocean/south-georgia-patagonian-toothfish-longline

3.5.1.2. Transitional fisheries

One concern for industry is how to encourage fisheries or aquaculture operations, that are not yet reaching the required standards for independent certification — but that wish to improve — to work towards meeting sustainability targets. If retailers and processors universally were to start to source only from certified operations, or operations that meet their own sustainability criteria, this could have the effect of penalising such fisheries and aquaculture operations that are in a transitional phase. Rather than penalising them, such operations should be encouraged and supported in their efforts to move towards sustainability.

The market is increasingly demanding sustainable seafood products, but the volume of certified supplies is not sufficient to meet market demand (see also section 3.5.2). Schemes that support transitional fisheries and aquaculture operations therefore play an important role in the broader realm of fish sustainability. An example is SFP, which runs the FishSource web site. This scheme aims to help less well-managed fisheries improve and meet the environmental requirements of major markets through private sector partnerships. A number of companies are using FishSource in their sourcing decisions to engage their supply chains in improvement projects, such as McDonalds, Wal-Mart and Foodvest.

Australia's DEWHA scheme also adopts a continuous improvement model for fisheries, designed to improve management arrangements over time. Conditions imposed on the fishery in order to maintain export approval may include the acquisition of better data about the fishery, and a precautionary approach is taken such that for fisheries where information is less robust, export approval may be granted for a shorter time and more conditions imposed on the fishery.

Such actions help reassure buyers and retailers that even where sustainability or certification has not yet been reached for a particular fishery, efforts are being made to improve the management and sustainability of the fishery or aquaculture operation and the situation is being monitored. This provides them with more confidence in their purchasing decisions.

Partnerships between retailers and industry in attaining independent certification can also support positive change. As discussed in the next section (3.5.1.3), the cost of certification often falls predominantly on producers. For small-scale fisheries and aquaculture operations in particular, this can be a barrier that prevents them from becoming certified. However, if retailers actively support their suppliers in improving their practices and achieving certification, the costs involved can be shared amongst all those with an interest in sustainability.

3.5.1.3. Market incentives and costs of certification

Price differentials and improved market access are two key incentives for industry to pursue independent certification. Both these aspects have been demonstrated for a number of fisheries (see section 3.6). Because certification involves the independent assessment of claims related to quality and sustainability, it increases the credibility of such claims and as such, producers can obtain a higher price for their product, and/or purchasers that did not previously source from the fishery or aquaculture operation may become interested — certification may facilitate market access although not necessarily with a price premium.

Whilst industry has used certification as a mechanism for generating positive publicity, they have also sometimes found that they need to educate consumers about the meaning behind the label[47]. This is reinforced by research into consumer attitudes and perceptions (section 3.5.3.2), the resulting

[47] E.g. As indicated in a communication from Spring Bay Seafoods, Tasmania, Friend of the Sea-certified mussel aquaculture producer.

importance of retailer and purchaser sourcing policies (section 3.5.2) and the fundamental drive for certification as coming from the seafood industry rather than from consumers.

Despite this, consumers' recognition and trust in ecolabels plays a part in their success in the marketplace in different countries. Whilst the difference in cost of various certification schemes may influence producers' decisions in choosing a certification scheme, the market acceptability and recognition of different labels should also be a factor when choosing which ecolabel to adhere to, and industry should select the best label for the expected destination market for their products. This may be partly influenced by retailers' and purchasers' demand for different labels, and will be linked to the level of trust in the different labels. Trust needs to be earned by ecolabels through independence, governance, transparency in standards development and certification processes, and the robustness of the standard itself.

Costs of certification

For all the private and voluntary certification schemes, there is necessarily a cost involved in certification. The costs involved vary (Table 13). The more demanding the certification requirements and standards are, the more expensive the conformity assessment process becomes, but the more robust and reliable the label itself is, generally. Industry and producers therefore need to weigh up the potential costs and benefits involved in the different certification schemes, together with market recognition and demand for different labels, and select the one most appropriate to their needs.

For fisheries certifications, Friend of the Sea aims to keep costs low, and the cost for the initial audit ranges from €5,000–50,000, with the average cost reported to be around €8,000. MEL is a bit more expensive still, with the only audit to have been conducted so far costing around €15,000. MSC is more expensive, with an optional pre-assessment costing around €3,500–14,000 and a full assessment costing €14,000–140,000, depending on the complexity of the fishery and the issues involved. Naturland fisheries certifications are likely to always be relatively expensive since the detailed criteria for a fishery will be developed on a case-by-case basis, although Naturland do not expect the producers to have to pay for this (instead expecting industry and/or donor funding).

The cost of aquaculture certifications is cheaper than for wild fishery certifications[48], costing around €300–500 for GlobalGAP and €650–850 (plus travel) for Naturland (registration plus certification costs). GAA is more expensive, costing around €2,500 for shrimp farms or hatcheries and €3,850 for processing plants (including registration fee).

The national schemes (TQS and DEWHA) are primarily government-funded, although there may be cost-recovery from the industry through taxes and fees. There also may be costs for industry associated with the assessment processes, such as for preparing documentation, and costs involved in meeting any conditions imposed. However, there would also be costs to the fishery if they were to lose their certification, such as the loss of export markets. Fully-supported government schemes also run the risk of being accused of providing subsidies to producers or fishers. This is perhaps more an issue in the aquaculture sector, where the government may provide free services such as water quality analysis to farms, thus lowering production costs. However, governments have also provided funding to help fisheries go through private certification processes.

[48] This reflects the certification scope and type of audit required — certification for aquaculture is at a farm level, whereas for fisheries certification is at a stock or fleet targeting a stock level, and there are more external variables to consider.

Table 13 Summary of costs involved in aquaculture and fisheries certification under different schemes

	FOS	MSC	MEL	Naturland	GlobalGAP	GAA[49]
Cost of membership/ registration	-	-	€375 (annually, not compulsory)	€500 (annually)	€10–100 (one-off) (depending on farm size)	€350 (one-off)
Cost of certification audit	€5,000–50,000	Preassessment €3,500–14,000; Full €14,000–140,000	~ €15,000	Aquaculture: €150–350 plus travel; Fisheries: €40,000–€500,000[50]	€300–400	-
Annual inspection costs	-	-	-	€150–350 plus travel	-	€3,500 (processing plants) €2,150 (shrimp farms) €2,150 (hatcheries)
Logo use	€3,000 (annually) ('per product with the same origin')	0.5% of sales plus fee of €180–1,400 depending on value of sales of MSC labelled products	€225–750 (annually, depending on tonnage of vessels (production), or number of employees (processing))	1% of net sales	n/a	No logo use fee (logo use is covered by other fees paid), but a 'Program certification fee' is levied: Processing plants min. €1,400 plus €1.4/t over 1,000t exported, up to max €8,600; Shrimp farms min. €350 plus €0.7/t over 500t up to max €2,900; Hatcheries €350

Costs for small-scale fishers or producers

The cost of certification can be prohibitively high for small-scale fishers or producers and for fishery and aquaculture operations in developing countries. There are varying approaches to making certification costs accessible for small-scale fisheries or producers. GlobalGAP allows for group certification in which the costs can be shared amongst a group or cooperative of small-scale producers. MEL and FOS both keep their audit/certification costs low, making them more accessible to small-scale fisheries or producers. Several companies confirmed that the cost of FOS was affordable, e.g. Seacold with regard to the Indonesian shrimp trammel net fishery, the Dutch gillnet fishery, the Philippine tuna handline fishery and a Tasmanian aquaculture producer. Naturland do not expect the farmers/fishers to pay for the costs of certification in developing countries — such costs are usually covered by the private sector or other funding. The cost of MSC certification can be a barrier for smaller-scale fisheries and/or fisheries in developing countries. Efforts have been made to streamline the certification process, thus reducing costs to some extent. For example, the MSC's recent project on quality and consistency has resulted in the preparation of a generic set of performance indicators for use in all fishery assessments. In addition to improving consistency, this new 'assessment tree' should make the certification process

[49] Costs are provided by GAA in US dollars. Converted to Euros using exchange rate of $1 = €0.717 as of 19 June 2009.

[50] The project cost for the Nile Perch certification was around €500,000, which included consultants' fees to develop the certification criteria, and payment of a price premium to fishers as an incentive prior to certification. Cost of certification of other factories or fisheries around the lake estimated at around €40,000 each (pers. comm., GTZ).

more efficient, reducing the time needed for CBs to undertake their work, and therefore reducing costs. Also, with an increasing number of certification bodies there will also be increasing competition that should have the effect of driving prices down. Funding may also be available from a number of grants and funds that support sustainable fisheries.

3.5.2. Retailers

Given their position at the point of sale, retailers can have a considerable influence over consumers' options and choices and have the potential to contribute substantially to raising consumer awareness of fish sustainability issues. In many countries of the EU (including the UK[51], Germany and the Netherlands) and in the US, supermarkets dominate the seafood retail sector, whereas in other countries such as Spain and Portugal, traditional fish markets and wet fish counters still play a significant role in seafood retail. Supermarkets supply all types of product including canned, fresh, chilled and frozen seafood, in many forms from whole to processed, from both wild capture fisheries and aquaculture. As a result, their attitude and commitment to sustainable fisheries and aquaculture can have a large impact on demand for the product.

This section considers the fish sustainability information provided by retailers to consumers, with an emphasis on supermarkets, but also considers the stances of restaurants and implications for other fish and seafood retailers. The scope of the review of supermarkets' fish sustainability information provision was restricted to information on their websites and other publically-available information and did not include direct consultations (see section 2). Websites are one of the methods used to relay information to the consumers; nearly all stores or organisations have developed one. The websites of twenty-five well-known supermarkets were reviewed to establish if the companies portray a public commitment to sustainable seafood and the level of detail in the information provided to consumers[52].

3.5.2.1. Supermarkets' fish sustainability information provision

Seafood sourcing policies

A range of factors has directed supermarkets towards orienting their sourcing policies more towards sustainability and the development of strategies to retain consumer confidence. Many of the major retailers are now using sustainable fish sourcing among their initiatives to be considered a more ethical supplier — many now have sustainable sourcing policies and publish seafood information as part of their corporate social responsibility commitments. Whilst NGO, consumer and policy pressure have all played a role in this, the need for retailers to ensure the sustainability of their supplies and maintain their brand reputation has meant that supermarkets often take the lead now in promoting sustainable fish products and ecolabels.

Most supermarkets have a sustainable seafood sourcing policy, and seafood is often used as a 'flagship' sustainability policy to demonstrate the company's sustainability credentials. Their policies may be reflected on the shop floor through labelled or certified products, sustainability claims on own-label products, such as 'responsibly sourced', 'sustainably sourced' or 'line-caught', signage at the point of sale and through information on their websites and in their magazines.

Commitment to sustainable sourcing from the supermarkets is demonstrated by a wide variety of recent efforts. Some of the steps commonly taken have included:

- Withdrawing certain products —some stores have removed threatened, endangered, over-exploited and vulnerable species from their shelves and have instead increased their supply of sustainable species[53];

[51] In the UK, the major retailers supply 88% of fish sold in the retail sector.

[52] See **Error! Reference source not found.** for the full list of supermarkets that were investigated.

[53] E.g. Carrefour which promotes herbivorous species in its fresh fish range and limits the deep-water species that it stocks.

- Committing to 100% sustainable sourcing by set dates;
- Obtaining chain of custody certification for their fish counters from certifying bodies, to be able to stock fresh and chilled certified fish;
- Forming alliances and partnerships with organisations externally, such as projects with their suppliers, fishermen, and aquaculture feed suppliers;
- Increasing the minimum size of the fish caught to be sold in their stores[54]; and,
- Developing clear purchasing decision-trees as part of their sourcing policies and 'fast-tracking' certified products.

Most of the supermarkets in this review claim to be currently sourcing a proportion of their fish from sustainable sources and have made a commitment to increase the volumes of sustainable seafood available in-store. Wal-Mart, for example, announced in 2006 that they would supply 100% MSC-certified seafood by 2011[55]. However, these types of commitment have drawn attention to a problem already recognised by many in the industry; the limited quantity of certified sustainable product that is available on the market. Wal-Mart has had to modify its MSC sourcing commitment and is now putting itself in the field of labelling product because there is not enough volume of MSC labelled fish to supply all of their product lines and stores. For Wal-Mart, this will provide them with control and reliability over the quantity that they require to fulfil demand, however, for consumers this will add to the proliferation of labels, potentially increasing confusion (see below).

Information provision

Supermarkets have several methods available to them in order to relay information to consumers such as videos, in-house magazines, in-store advertising, labelling and information on packaging and at the fresh fish counters, as well as their websites.

The level of information offered on sustainability varies considerably, between those who do not mention sustainable fisheries at all on their website, such as Aldi, to those with detailed policies on sourcing sustainable seafood, several pages of information, links and involvement with other initiatives, such as Sainsbury's. Some of the sourcing policies are published on the websites; others maintain privacy but indicate that provision for seafood sustainability is included in their policies.

For those that do provide information, a broad range of information on fisheries and seafood issues is covered on their websites. The information is often centred on a statement that they are aware of the issues surrounding seafood, illustrated by paragraphs of information on different issues, such as: impacts of the industry and associated problems; over-exploitation and resource depletion; discards; impacts on the ecosystem; why fair and responsible fishing is important; and issues in aquaculture e.g. sources of feed. To complement this they state their intentions to support the industry and its longevity through responsible sourcing.

The amount of information provided by retailers on sustainable seafood varies between them, and seems to be reflected in the level and depth of the commitment expressed by them about their sourcing policies[56]. Nearly all of those reviewed showed intentions to continue improvements in procurement of sustainable fish and fish products. These efforts tend to follow a similar trend to the number of sustainable seafood products which the retailers say they stock.

The provision of information and efforts to convey the importance of sustainable fisheries and purchasing choices to consumers by supermarkets tends to be on a smaller scale than for NGOs with consumer awareness campaigns. For example, supermarkets' websites sometimes provide links to

[54] E.g. since 2000, Carrefour inspectors have been monitoring the compliance of incoming fish for minimum size.
[55] http://Wal-Martstores.com/FactsNews/NewsRoom/5638.aspx.
[56] Reviewing the detail of their sourcing policies was not within the remit of this project; this refers to the information on the websites that the retailers comment about their own policies.

certification schemes' websites or NGO websites with more detailed information on fish sustainability, rather than providing first-hand information. This seems to be a suitable and convenient way for the supermarkets, who do not want to expand their websites to include detailed information regarding the problems and issues surrounding the fishing industry, to inform consumers. MSC was the predominant organisation referred to and the link most often provided. WWF and Greenpeace were also frequently referred to, and both exert pressure and directional steer on the retailers. These results are not surprising given the high profile and involvement of these organisations in these issues. In turn, these organisations need to accept a high level of responsibility and act accordingly.

Supermarket own labels

A number of supermarkets have developed their own sustainability labels for seafood. For example, in Germany, Kaufland have started labelling seafood products with their own green logo with the intention of reducing confusion for consumers. In 2005 Carrefour launched a label/brand called '*Pêche responsible*' (Responsible Fishing) in its French and Belgian stores for four frozen products which claims to guarantee optimal traceability and stock management as well as respect for the ecosystem. In 2008, Carrefour supermarkets in France launched MSC-certified frozen products under the Carrefour Agir Éco Planète brand, as well as the other MSC-certified fresh products. Other supermarkets label fish products with 'responsibly sourced' or 'sustainably fished'.

With increasing demand for fish, the limited quantity of ecolabelled product available is a significant hindrance to retailers' aspirations to supply of only products from certified fisheries. This has been one of the stimuli for supermarkets to develop their own-brand sustainability labels and claims (see above for the Wal-Mart case). However, with the various labels already on the market, the creation of supermarkets'-own labels and increasing number and variety of sustainability claims by both ecolabels and supermarkets contribute to a lack of clarity regarding the content behind the various claims and resulting consumer confusion. Furthermore, supermarkets' own labels are less likely to be third-party certified or to have involved a wide range of stakeholders in the development of standards.

Supermarkets' role in clarity of issues

Supermarkets have a responsibility to evaluate the labels they choose to stock to ensure they are satisfied that the sustainability claims that they make are legitimate. Different labels certify different things, and have varying emphases on environmental issues, social issues, organic production methods, animal welfare etc. It is not realistic to anticipate that labels will include all the sustainability concerns of the retailers. Rather it would be best for individual labels to be clear about what aspects of sustainability they certify and how. With the increasing number of ecolabels, and consumers' general lack of awareness of labels (see section 3.6.1) and fish sustainability issues (section 3.5.3), the responsibility for selecting "good" ecolabels on behalf of consumers falls to the retailers. Indeed, research has shown that consumers actively want their retailers to choose appropriate ecolabels since they know that as individuals they lack the specialist knowledge and skill to choose them (Seafish, 2007) (see also Section 3.5.3.3 on consumer confusion).

3.5.2.2. Restaurants

Restaurants are important places for seafood consumption[57] and the number of seafood eateries including sushi take-away outlets has multiplied in the last few years with increased demand in western countries. Consumers may be more likely to try unknown species of fish when eating out at a restaurant and be less price-conscious than when shopping at the supermarket. Restaurants can therefore have a significant influence over seafood consumption, introducing the public to lesser-known fish species and supporting sustainable fishing industries. Chefs, in particular celebrity chefs, can also exert a powerful influence on consumer behaviour.

[57] For example, in the UK, almost half of the seafood purchased by consumers is in the 'out of home' or foodservice sector; seafood meals away from home are also important in the USA.

In recent years there has been an increasing commitment to sourcing sustainable seafood in the restaurant sector, but this sector still lags behind the supermarkets. However, there are a growing number of initiatives to help and encourage restaurateurs to develop and implement sustainable sourcing policies.

Some restaurants have developed their own sourcing policies and ethics. For example, the Scottish seafood restaurant chain Loch Fyne, which has 40 restaurants, places a significant emphasis on sustainability. Other localised examples exist also such as the fish and chip shop Colman's in South Shields where no farmed fish is served, where cod is line-caught off Iceland, and local day boats supply gurnard, ling, crab and lobster. However, it seems that sustainable seafood restaurants may be challenging to run as businesses. For example, a 'vegaquarian' restaurant set up called SOS, the first of its kind in Australia to commit to serving sustainable seafood, closed after a year. Several other restaurants committed to sustainable seafood also seem to have failed within a few years, such as 'Tom's Place', a high-end fish and chip shop in London run by Tom Aiken.

Restaurants can become certified under the MSC Chain of Custody standard to be able to use the MSC logo to indicate MSC-certified seafood available on their menus. According to the directory on the MSC website, only a handful of restaurants in five countries have obtained this, with the majority in the Netherlands and the UK. In June 2009, 24 businesses were registered under the restaurant category, but only 16 of these were actually restaurants, with the remaining being certified businesses such as suppliers, catering companies and a conference centre. However, the directory may not be up-to-date, because additional MSC-certified restaurants mentioned in other parts of the MSC website, did not appear in their register (e.g. Oxford Brookes University Campus, the sushi restaurant Moshi Moshi, Hampshire County Council Catering Services for schools, the Michelin starred Manoir aux Quat' Saisons and the healthy fast food restaurant chain Pret a Manger). This kind of discrepancy in basic information can only add to consumer confusion and should be avoided as much as possible.

There are a number of initiatives to support restaurants in sourcing and selling sustainable fish. The Seafood Choices Alliance published a seafood guide for restaurants in the USA in 2005 and 2007 entitled, 'Sourcing Seafood: A Professional's Guide to Procuring Ocean-friendly Fish and Shellfish'. An informal network called 'Good Catch' was set up in the UK by SeaWeb jointly with three other organisations including Sustain, MCS and the MSC[58], and similar networks also exist in other countries, for instance the 'Chefs Collaborative' in the USA. In 2008, the 'Good Catch manual — a rough guide to seafood sustainability for chefs, restaurateurs and caterers' was published by SeaWeb followed by a similar guide in French 'Le Guide des espèces à l'usage des professionnels'. Charities, environmental NGOs and aquariums have also been involved in trying to raise awareness in the restaurant sector to encourage chefs to commit to sustainable sourcing. For example, Greenpeace UK produced a fish purchasing policy for restaurants.

A number of campaigns have used celebrity chefs to raise the profile of sustainable fisheries and encourage both consumers and restaurateurs to source fish from sustainably-managed fisheries. An event was launched at Old Billingsgate Fish Market in London with top chefs Raymond Blanc and Tom Aikens urging other chefs to use only sustainable seafood. In Spain, a chef called Sergi Arola participated in a campaign with WWF to promote more sustainable fish consumption. AMCS has run several public awareness campaigns in Australia that have included celebrity chef Kylie Kwong and author Tim Winton. Hugh Fearnley-Whittingstall (River Cottage) in the UK and Canadian chef Robert Clark, have taken their own initiatives to encourage sustainable seafood. A number of aquariums have also run campaigns involving celebrity chefs, such as Monterey Bay Aquarium, Vancouver Aquarium the Shedd Aquarium in Chicago, Aquarium of South Carolina and the Aquarium in Boulogne sur Mer in France.

[58] http://www.goodcatch.org.uk

As well as encouraging restaurants to make improvements concerning sourcing fish from sustainably-managed sources, some organisations have also focused on encouraging sourcing of seasonally-available fish from local fishermen, building partnerships with them and diversifying the species they source.

3.5.3. Consumers

3.5.3.1. Consumption patterns

Globally, 56 % of people eat fish at least once per week. Fish consumption increased over the period 2006–2008, compared to a reduction in the consumption of red meat over the same period (Banks, 2009)[59]. This is likely to be in response to health advice encouraging people to reduce their meat consumption, and the known health benefits of eating fish and other seafood.

People in Asian countries eat fish most frequently, consuming fish and seafood at least twice per week (e.g. Philippines, Malaysia, Singapore, Thailand, Hong Kong, Indonesia, Japan, Taiwan and Vietnam) (Banks, 2009). The only European countries that fall within the same range are Portugal, Spain, Norway and Denmark. It is notable that in the countries where fish consumption is highest, there is a lower awareness of and/or interest in fish sustainability issues and a consequent low penetration of ecolabels.

3.5.3.2. Consumer awareness and priorities

Consumer awareness about fish sustainability issues and labels

Consumer awareness about fish sustainability issues is increasing but is still relatively low in relation to other environmental and ethical issues. WWF consumer surveys conducted in the Netherlands and Germany indicated an increase in understanding of the term 'sustainable' fisheries amongst consumers from 28 % in 2006 to 51 % in 2008. However, consumers' awareness of different labels varies widely, and some of the fishery sustainability labels are still the least-recognised amongst consumers. For example, the WWF consumer survey in Germany (WWF, 2008) showed that 'organic' labels were the most widely recognised, by over 95 % of consumers, whereas the MSC label was only recognised by 11 % of consumers in 2008. Organic labels generally have been in the marketplace for much longer and cover a much wider range of products than the MSC and therefore would be expected to be more widely recognised. MSC recognise this as a potential issue, as most of their outreach work to date has been to industry rather than consumers. However, they have plans to increase their consumer outreach work and raise awareness of their label. Consumer awareness is a useful measure of the uptake of information on the sustainability of fisheries and seafood, although it does not necessarily reflect purchasing decisions.

Consumer priorities in purchasing decisions

Banks (2009) reported that ethically-produced or sourced products have a low priority for consumers in their purchasing decisions, ranking ninth out of a list of ten environmental or social purchasing options in 2009 (e.g. locally-made products, organic products, products with little or no packaging, fair trade products)[60]. Energy-efficient products or appliances came top, with 53 % of consumers claiming to actively try to buy such products. The categories showing the biggest increase over the period 2007–2009 were locally-produced products and products bought from a farmers' market.

When considering seafood specifically, sustainability tends to figure low on consumers' priorities for their purchasing decisions. Price, best before date, freshness, physical appearance and food safety were all identified as more important than sustainability (Omnibus Seafood product consumer insights 2009, cited in Hajipieris, 2009). Even for the most eco-conscious consumers in the UK, awareness of

[59] Neilsen Global Online Survey April 2008.

[60] Neilsen Global Online Survey March 2009. 25,420 consumers in 50 countries.

sustainability issues does not translate into it being a purchasing priority, with only 1% citing 'sustainably sourced' as their primary decision in purchasing seafood (Seafish, 2008). This is understandable since the first priority for most consumers is that the food they eat is safe and healthy. Subsequent to this fundamental requirement being fulfilled, other options can be chosen, such as sustainably- or ethically-sourced produce. Indeed, 13% do take sustainability into account in their seafood purchasing decisions, even if it is not the top priority.

The consumer survey carried out by WWF Germany indicated that 'no overfishing' and 'fishing does not harm the environment' were fourth and fifth on a list of nine priorities for consumers seafood purchasing decisions over the period 2006–2008, influencing the purchasing decisions of 40-45% of people interviewed (Table 14).

Table 14 Percentage of consumers for whom various factors are important in fish purchasing decisions

	Oct '08	Apr '07	Feb '07	Sept '06
Product freshness	83	84	82	81
Price	76	73	77	71
Fewer fish bones	58	61	59	62
No overfishing	45	49	45	39
Fishery does not harm environment	41	41	43	41
Product caries environmental label	22	30	31	23
Brand	34	28	28	30
Product from wild catches	12	14	15	16
Product from aquaculture	11	12	11	11

Source: Summary of FORSA opinion poll results 2007 to 2008 on sustainable fisheries for WWF Germany[61].

Media influence

Although sustainability currently figures quite low on most consumers' priorities when purchasing seafood, its importance is likely to increase. Recent media campaigns such as those for the film 'End of the Line' are raising the awareness of consumers and retailers about the state of fish stocks globally and the need for purchasing decisions to support sustainable options. 'Ethical' products, including Fairtrade, organic and sustainability labels, are one of the four 'megatrends' in the food retail sector identified by Neilsen Media Research company (together with health/well-being, indulgence/pleasure, and convenience/ practicality). The market-watcher Mintel also identifies the increasing demand for ethical and sustainable food and drink products, including fair-trade and organic items, which almost doubled in 2006 (APFIC, 2007).

3.5.3.3. Consumer confusion

Consumers who want to make ethical purchasing decisions are faced with a plethora of information about sustainability, the environment and social issues. A range of different media campaigns have aimed to raise awareness of different issues. This results in mixed messages which can be difficult for the consumer to navigate their way through. For example, should they buy local, supporting local business and minimising food miles, buy fair trade products and support small-scale producers in developing countries, or should sustainability of fish stocks be their greatest concern? Should they buy products that claim to minimise environmental impacts, avoid endangered species, buy dolphin-friendly wild-caught tuna, or organically-produced farmed shrimp?

In Section 3.5.2.1 we discussed the problem of the proliferation of sustainability labels. Added to this confusion is the fundamental issue of the mislabelling and renaming of seafood, either to make it sound

[61] Opinion polls were representative Online-in-Home interviews. Question asked was 'If one buys frozen or chilled fish, fish products or fish dishes, various factors can be of importance. Which of the following are important for your personal decision for buying those products?' Supplied by WWF.

more palatable to consumers (e.g. Patagonian toothfish marketed as 'Chilean seabass' in the USA), or to avoid higher import tariffs on particular products or species, or to specifically to mislead the consumer to obtain a higher price for a lower-value product (e.g. Alaska Pollock labelled as cod, paddlefish roe labelled as sturgeon caviar) (Jaquet & Pauly, 2008).

Certification schemes

For consumers who want to purchase 'ethical' or 'sustainable' seafood, which label should they choose? For wild capture fisheries, there are a limited number of labels available — MSC and FOS are currently the main labels; MEL-Japan and Naturland are both very new to capture fisheries, and MEL-Japan is likely to apply mainly to the Japanese market. However, for aquaculture there are a wider variety of labels including GAA, FOS, numerous organic labels, as well as animal welfare labels such as the RSPCA Freedom Foods label. There is a danger that consumers could confuse the different messages from the labels, for example that a sustainability label on a wild capture fishery product implies it is organic, or that an organic label means producers' rights are supported.

Consumers also may not distinguish between wild-caught and aquaculture-produced seafood, and not understand the different sustainability and environmental issues linked to each type of production system. The fact the schemes have different emphases, and assess fisheries and aquaculture operations in different ways, can cause confusion amongst consumers, who may not recognise the differences between the labels. Labels should have clear meanings and transmit reliable information. In this way they will facilitate informed purchasing decisions by consumers rather than undermine their confidence in the information they are receiving. It may be that several labels are applicable to a particular product, for example a combination of fair trade with organic for aquaculture products; and with sustainability for wild-caught products.

In the face of such a plethora of messages and labels in their purchasing decisions, many consumers are likely to leave the choice to the retailer, and may automatically (and reasonably) expect their supermarket to stock only legally-caught and sustainable fish and seafood that has been caught or produced in a way that respects the environment as well as workers' rights. Research indicates that consumers put their trust in retailers in relation to sourcing decisions (Seafish, 2007). When asked the question of whom should be responsible for ensuring the sustainability of fish stocks, most consumers do not take responsibility, instead expecting government and industry to take the lead (Seafish, 2007; Banks, 2009). Although consumers do not task retailers themselves with ensuring sustainability of fish stocks, in practice, while fish stocks are in varying different states of exploitation, the responsibility for such sourcing decisions may well fall on the retailers; this also provides a competitive opportunity for them. The role of the retailers is therefore very important and likely to become more so in the future. This is also likely to be the case for the selection of the various different ecolabels — which labels retailers choose to stock in their stores. Retailers' own seafood sourcing policies are likely to have increasing importance in the years ahead (section 3.5.2).

Recommendation lists

As described in Sections 3.2.2 and 3.4, while recommendation lists aim to inform consumers about sustainable choices in seafood, their low level of resolution can also give rise to confusion. The different status of different stocks of the same species of fish, or different recommendations for different catching methods, can confound consumers' best intentions to make the right purchasing decision. Whilst ecolabels can assure consumers directly that a particular product is from a sustainably fished stock, recommendation lists communicate information that encompasses the current status of different fish species or stocks, and distinctions between fishing methods and origins. The broad categorisation of fisheries in recommendation lists may hinder some sustainable fisheries if they are categorised together with those branded as unsustainable. For example, Chilean seabass/Patagonian toothfish was on the red list for six of the nine organisations' lists including Greenpeace and MBA, although the South Georgia Patagonian toothfish fishery is certified by the MSC.

Most NGOs try to tailor their guides to national markets in terms of the species included on the list and the most common sources for such species. However, there is often a mis-match between the level of information needed by consumers to select the 'recommended' fish and the level of information available on products at the point of sale (i.e. packaging does not have the necessary information regarding species, origin, fishing method etc. on it), which may make the difference between it being a 'best-choice' or an 'avoid-at-all-costs'. This reduces the usefulness of the recommendation lists, but also puts the onus on retailers and suppliers to provide more information about the origin of seafood and catching or production methods used, so that well-intentioned consumers are able to make best use of the information to hand and reach the 'right' decision.

There are also differences in recommendations between different guides, based on how the scoring system works, the priorities and policies of the organisations that produce the guides and the species available at the local market (and their predominant origin) (Armsby & Roheim, 2009[62]). Some species have been given different categorisation by different organisations, for example Alaskan Pollock was placed on Greenpeace's Redlist because it is a trawl fishery method, yet the MCS (UK) classify it in the middle (second choice) category, Seafood Choices Alliance and MBA have approved 'wild' Alaskan Pollock, and the MSC have certified several pollock fisheries. Further confusion arises amongst the seafood guides from different ways of referring to species or groups of species. For example in the case of tuna, there are several species on the market with quite different characteristics and stock conditions and the lists refer to them differently: the WWF guides refer to 'yellow tail tuna' (Indonesia) (which may be kingfish not tuna), 'yellow fin' (Norway), 'tuna' (Denmark), 'tuna red' (France) (bluefin tuna), and 'Bluefin tuna' (Belgium and Switzerland). However, some NGOs are making efforts to ensure consistency between guides produced by different national offices of the same organisation, as well as between guides produced by different NGOs. For example, MBA has been coordinating with Blue Ocean Institute, Environmental Defense Fund and SeaChoice to help ensure consistency among recent sushi guides, and work with a number of NGOs that use the Seafood Watch rankings to ensure consistency.

3.6. Measuring success

As evidenced by this report, there is significant interest in measuring the success of fish sustainability information schemes, and understanding what has made them more or less effective (see also Ward 2008). In other sections of this report we have discussed the main features of a selection of schemes with quite different characteristics. They all share the common purpose, however, of trying to steer consumers and industry towards purchasing seafood products from sustainable sources. The overarching goal is to modify market demand in a way that will support sustainability and ultimately benefit the environment.

The recommendation lists present clear choices directly to consumers: buy fish products on the 'good' list and don't buy those on the 'bad' list. However, the degree to which this shift in demand transmits a second-order effect through the supply chain resulting in alleviation of pressure on overfished stocks is difficult to determine. A significant reduction in demand might cause the price to drop[63], thereby making the fishery less economically attractive, causing fishers to move to other fisheries, or to have to fish harder in order to generate sufficient income. But before this happens, it is possible that a fishery that has its products on the 'bad' list, and is concerned about negative publicity, responds by taking immediate action (either by management, industry or both) to mitigate the problems that have resulted in the listing and preserve their position in the market. Examples of this may include a reduction in catches to encourage recovery of the stock (and an associated general improvement in management practices), or a change in gear to reduce bycatch.

[62] Nine guides were reviewed, four of which are included in this review: Greenpeace, MCS UK, MBA and MSC.
[63] This may manifest itself directly in the existing market, or through suppliers having to sell into markets that are less discerning in terms of sustainability issues, but consequently offer lower prices.

In contrast, rather than trying to steer consumers away from unsustainable fish, the certification schemes send a signal to industry that good practice can be recognised. This recognition can then be rewarded by access to markets where demand for sustainable fish is high and where a price premium may be realised. Once a fishery decides to pursue certification, it is likely to embark on a path that will require it to carry out some improvements within a set time limit, except in the rare case where the fishery is already operating to the standard required for certification.

Under both systems there are several aspects for which signals of success can be defined and measured. In the following sections, we discuss four types of measures and associated evidence for the success of certification schemes and recommendation lists. We also acknowledge, however, that indications of success may not be evident for a number of reasons, including lack of data, or the industry reacting in a way that undermines the potential benefits, such as deliberately undercutting prices, or seeking out markets that are less sensitive to concerns about sustainable fishing and responsible sourcing.

3.6.1. Market share

For a scheme to have the necessary influence, it must have sufficient share in the market. In other words, even if a scheme has all of the right features, if it has no customers, it can have no influence. In addition to making the scheme effective, significant market share is also a mark of the credibility of the scheme. To achieve a good market share, those in the industry, in particular, need to trust the outcomes of the assessment process and believe that the process, be it a certification, or a listing, is fair, equitable and accurate. Effective outreach and brand recognition is also a necessary component of achieving market share[64]. When using this as an indicator of success, it is important to consider how it has been realised (e.g. at a low price).

Specific data on market share of different schemes are not readily available[65]. We have therefore compiled available information that may reflect market share[66]: numbers of fisheries or aquaculture operations certified, volume of certified product, numbers of product lines, numbers of countries in which labelled products are sold and overall consumer awareness. We note that such data are not consistently available for all schemes. In particular, market share is significantly more relevant for schemes that involve certification of specific fisheries than for those that prepare recommendation lists.

FOS list 50 fisheries as 'approved fisheries' on their web sites[67]. 38 audits for fishery and aquaculture products had been carried out for FOS as of June 2009, and a further five were under audit. However, in counting the number of fisheries certified, it is not always clear how a 'fishery' should be counted; some FOS audits cover mixed fisheries comprising a number of species (e.g. Azores demersal fishery, New Zealand fisheries). If these are counted separately (counting each species covered by an audit as a separate fishery), around 65 fisheries have been certified, and between 21 and 26 aquaculture operations[68]. Further audits have been carried out on processors, importers and retailers as part of the chain of custody; the numbers specified here refer to actual fisheries. In total, by June 2009, FOS claimed to have assessed over 10 million tonnes of fisheries products and 500,000 tonnes of farmed products. FOS has over 400 product lines selling in 25 countries[69]. Over 200 of these lines sell in Italy,

[64] Improved market access may be linked to a price premium. The latter is considered under the heading of economic incentives.

[65] See Section 3.6.2 for some specific anecdotal examples of market share increase following MSC certification.

[66] The issues of sourcing commitments by retailers and consumer awareness/logo recognition are discussed in Sections 3.6 and 3.7 respectively.

[67] http://host1.bondware.com/~fos/news.php?viewStory=151, 26 June 2009.

[68] Based on analysis of information available on website, 25 June 2009.

[69] Information compiled from website, June 2009. Counts the same product selling in a different country or in different supermarkets in the same country separately, but does not count different package weights of the same product separately (e.g. see salmon products in Italy).

the main market for FOS products. The next biggest market is Switzerland with 19 lines, followed by Spain with 14 lines[70].

As of June 2009, 48 fisheries had achieved certification under the MSC, and over 100 more were going through the assessment process. MSC report this represents about 8% of the world's edible wild capture fisheries being engaged in the programme, representing 42% of the global wild salmon catch, 40% of the global prime whitefish catch (cod, pollock, hake, haddock, and saithe) and 18% of the global spiny lobster catch. In total, over 5 million tonnes of seafood is either already certified or being assessed for certification (Howes, 2009). MSC is increasing their outreach to fisheries in developing countries, and 12 are currently certified, going through certification, or are serving as pilot projects in the data-deficient fisheries trials.

The number of MSC-labelled products has grown rapidly in recent years. At the end of 2006 there were 400 MSC labelled products, but this had grown to over 2000 products as of March 2009 (Howes, 2009). MSC products are now sold in 50 countries. The UK, Germany and USA are by far the largest markets, accounting for around half of the total MSC-labelled products globally.

To date MEL-Japan and Naturland have certified only three fisheries and one fishery respectively, reflecting the recent development of these standards (2007 and 2006 respectively). It is too early to judge whether this is a reasonable measure of their performance relative to other schemes. We note also that MEL-Japan is predominantly aimed at the Japanese market, and products are currently only sold in Japan, which clearly limits the overall market share that the scheme is able to capture.

In terms of the national standards, TQS and DEWHA differ in their approach and in their reach. TQS has had very limited success — only 125 Thai Quality Shrimp labels have been awarded (as of December 2008) out of around 30,000 shrimp producers in Thailand. In contrast, about half of all producers are certified to the GAP scheme, since it contributes directly to the exportability of the products. DEWHA, by contrast, as a mandatory scheme for any fishery wishing to export from Australia, has 100% coverage of all Australian Commonwealth fisheries, and State-managed fisheries with an export component. This amounts to 121 fisheries.

GAA estimate that 10% of the shrimp imported into the USA were certified to the BAP shrimp farm standard in 2008[71]. As of 31 March 2009, the total certified capacity of shrimp farms was 118,000 tonnes, from operations in 14 different countries.

Assessing the 'market share' of recommendation lists is difficult since they are not products that are sold. However, one means of assessing the success of the information providers is to consider the number of guides that have been distributed by the various agencies. WWF Netherlands and Germany have conducted seafood campaigns, including distribution of seafood guides. The distribution of guides and results are provided in Box 1.

[70] However, we have been advised that the information on number of product lines on the FOS website is probably not up-to-date; therefore there may be more product lines, and more lines in some countries than reported here.
71 Source: information from GAA.

Box 1 Monitoring data on seafood campaigns from WWF NL and WWF Germany

WWF Netherlands

During the campaign period (2006–2008), 3 million seafood guides were distributed, and 35,000 online guides were downloaded (as pdf). A further 1.8 million seafood guides were printed in May 2009.

The surveys showed that the percentage of people who knew about the existence of the Dutch seafood guide rose from 31% in 2006 to 36% in 2008. Usage of the guide was highest in the over-49 year-old age category (34% in 2008, up from 27% in 2006). However, the largest increase was in the 18–34 year-old age group which rose 12 percentage points, from only 11% using the guide to inform their purchasing decisions in 2006, to 23% using it in 2008. In the 35–49 year-old age category, there was a slight increase from 23% to 25% using it.

WWF Germany

WWF Germany distributed a print run of 1.5 million seafood guides for the previous version of the guide, and a further 2 million are planned to be distributed in 2009. This shows a significant increase in circulation from the first edition of the guide in 2001 which began with a print run of 10,000, followed by 20,000 in 2003. The WWF 'fish card' has also been used since 2006 as a magazine insert (e.g. National Geographic Deutschland as an insert for their subscription issue).

Source: Internal evaluation document 'Evaluatie Leven in Zee2', May 2008 (after active seafood campaigns in 2006-2008). Highlights only, full evaluation report = 12 pages. Translation from Dutch by Miriam van Gool, WWF.

3.6.2. Economic incentives

This is closely related to market share; increased demand for a certified or listed product should translate into economic benefits for the fishery participants, even if there is no clear price premium. If fisheries do benefit in this way, the incentive to remain in the scheme and for other fisheries to become certified increases and other benefits should follow. In theory a price premium is measurable but in reality it is very difficult to demonstrate direct cause and effect, as price premiums can be generated in other ways, such as through improved handling and quality. Higher prices can also be a disadvantage for low income groups that rely on fish as a source of protein, potentially spilling over into a negative social outcome.

Economic benefits are often hard to attribute. The MSC website lists the following potential advantages of certification: secure contracts; access to new markets; potential price premiums; good reputation; improved relationships; economic stability; confidence in the future; and a competitive edge in the marketplace which can open new doors. However, we found little 'hard' evidence of economic benefits or incentives arising from the schemes we studied. Where economic benefits are evident they usually relate to a specific fishery and/or market situation rather than being a model that can reasonably be expected to be duplicated elsewhere. Therefore most schemes do not make claims of specific quantifiable economic benefits (e.g. an expected percentage price premium), but such benefits are sometimes implicit or suggested.

In the absence of hard evidence, the MSC has resorted to undertaking a survey of certified fisheries seeking out before and after "stories" to demonstrate the benefits. According to the results[72], these do include price premiums and increased access to markets. For example, the Hastings Dover sole, herring and mackerel fishery reported a price premium of up to 10% in Holland for Dover sole and 15% in France through the retailer Casino. Their perception was that the MSC certificate has made it a more desirable product and increased the demand. Similarly the North Eastern Sea Fisheries Committee has

[72] Based on reports provided by the MSC, May 2009.

reported up to 25% higher prices when selling certified sea bass to top London restaurants compared to pre-certification. The south-west handline mackerel has seen a substantial rise in the price over the last few years from £1.10 per kilo up to £4.40. This is not necessarily a result of certification, but they now regard certification as working towards protecting their market, especially as the general view is that all retailers are heading towards sourcing from certified fisheries.

TQS claim that certification results in economic benefits from the maintenance of exports, although a large number of producers manage to export without a TQS certification. FOS does not claim any economic benefits. However, a Switzerland-based sushi company reported increased sales which it attributed to stocking FOS-certified tuna[73], and anecdotal evidence suggests that there may also be benefits, especially to small-scale producers/fishers, relating to entering new markets and gaining access to traders and retailers to which they would not otherwise have access.

Stories such as these are encouraging for those wanting to promote certification to the industry, but they say little about the overall picture. Product volumes in these cases are often small and the opportunities to sell at higher prices are generally few. These benefits also need to be balanced against the cost of achieving and maintaining certification, which are significant in some cases. Once certified, a producer may consider the cost of continued certification as part of the price of doing business, since a discontinuation carries too great a risk, particularly in an environment where more and more fisheries are becoming certified. Equally those fisheries that have not yet achieved certification, possibly because the cost is too great, rather than there being a problem of sustainability, may find their market access reduced as a result, thereby making certification more or less essential to stay in business. This is particularly a concern for developing countries, where ecolabels could become a barrier to trade (see Section 3.3.4).

3.6.3. Environmental gains

Environmental gains are arguably the key objective of all fish sustainability certification and listing schemes. If no environmental gains are realised, then much of the discussion of the benefits of making informed choices when buying seafood is hollow rhetoric. However, actually demonstrating such gains and attributing them unambiguously to the certification or listing of a fishery or species is extremely difficult. Nevertheless, it may be possible to identify changes in management practices that have come about as a result of specific conditions put on fisheries in order to achieve and/or retain certification, and thus demonstrate a linkage between the certification and an environmental gain.

MSC and Naturland have each carried out studies or research projects that have looked into the environmental benefits of their certification programmes. The MSC study (Agnew *et al.*, 2005) looked in detail at several fisheries that had been certified for some time, some of which were going through re-certification, to assess progress against the conditions set by the CBs. In essence, rather than seeing specific changes in stock status that can be attributed to certification, it is changes in management practice that might reasonably be expected to result in environmental benefits that are evident. An exception is the South African hake fishery. To meet the conditions of certification, this fishery introduced the use of steamer or tori lines to reduce seabird mortality — a problem that caused declines in albatross populations in the Antarctic. In a relatively short period of time the numbers of annual seabird deaths dropped from 18,000 to just 200.

FOS has provided examples of environmentally-friendly actions that particular producers and businesses have taken as a result of their involvement with FOS. For example, an aquaculture producer in Italy stopped using toxic antifouling paints in order to pass the FOS criteria, and an aquaculture plant in Vietnam introduced water quality monitoring as part of its corrective actions to meet the criteria.

[73] Personal communication, Alexandre Striberni, Covedis, 29 May 2009.

3.6.4. Social benefits

Fisheries which are sustainable will be better able to support fishing communities and aquaculture producers over the long term. Therefore, if economic incentives, environmental gains and improved food security are realised through sustainable certification and listing schemes, then social benefits should also accrue. Changing market access may have social benefits to producers in developing countries, but may also have negative impacts in terms of food access for local consumers. For those schemes that include social criteria, more specific linkages between the scheme and social benefits may be monitored and assessed. No evidence of specific or general social benefits arising from certification has yet been clearly identified, but the fact that schemes applying to aquaculture generally include social criteria suggests that this is a significant and potentially quantifiable benefit, at least in this sector.

4. Conclusions

4.1. What makes a good fish sustainability information scheme?

This review has compiled a substantial body of information on a selection of fish sustainability information schemes that we believe to be representative of the current state of the art in this field. This information is presented in full in Annex 1 and summarised in Section 3. Section 3 also traces the history and development of the schemes, and presents an analysis of the role of the schemes from three different perspectives: the fishing industry, supermarket retailers and consumers, and how the success of the schemes has been and can be gauged. Based on this review it is reasonable to draw conclusions about what makes a good fish sustainability information scheme that will be relevant both to those included in the review, and by inference should also be useful for those not included. To our knowledge there are no schemes currently active that depart significantly either in structure or function from the range we have investigated. In this concluding section we summarise the desirable features of fish sustainability information schemes in the ambit of good practice, and how these features have been and may be applied in both certification schemes and recommendation lists.

It is important to note that this review has taken place in an environment of change and, in most cases, continuous improvement in the schemes being considered. A number of internal assessments against the FAO guidelines have been on-going[74] and changes have been made to some of the schemes that bring them both into closer conformance with the FAO guidelines, and more into line with what we also consider to be good practice. While this is a very welcome development, it has made it difficult to keep the review current. In cases where we were informed of changes up to the end of June 2009, the new information has been incorporated to the extent possible.

It is difficult to gauge the extent to which these changes have been catalysed by contact with the project team. However, throughout the process, the majority of the organisations contacted have expressed significant interest in the review and there is clear evidence that some improvements were made in response to feedback provided in the early stages. This bears similarities to the process of continuous improvement in fisheries that takes place while those fisheries are being assessed by the schemes themselves.

In the following sections we describe our current view of best practice with which existing schemes should continue to conform, or to which they should aspire. To structure the discussion, we have focussed on the following attributes of the schemes that we think usefully defines what is needed:

- Scope
- Accuracy
- Independence
- Precision
- Transparency
- Standardisation
- Cost-effectiveness

Aside from these attributes, an overarching premise is that all schemes should endeavour to conform to the FAO guidelines, which, while voluntary, provide a framework of good practice and include practices that would contribute positively to all of these attributes. Accordingly, we have not repeated every element of the guidelines here in this expectation.

[74] between January and June 2009

As in Section 3, we again acknowledge the clear distinction between the two main categories of scheme: certification schemes and recommendation lists. While schemes in both categories should display all of these attributes, we discuss the way in which this can be achieved in each case. We also draw comparative conclusions between the merits of each.

Where we have drawn examples of good practice to illustrate specific points, this should not be regarded as an indication that the schemes not mentioned do not conform, just that we have tried to use the most illustrative examples available.

4.1.1. Scope

As described in Section 1.4.1, the FAO guidelines for ecolabelling of marine capture fisheries cover three components under minimum substantive requirements: the management systems; the stocks under consideration; and ecosystem considerations. A good fish sustainability information scheme covering capture fisheries should include all three of these components. Indicators of the performance of a fishery should cover the type, amount and quality of information available, the way a management system responds to different circumstances and, crucially, the outcome, i.e. actual status of the target stock and the rest of affected ecosystem.

The draft FAO guidelines on aquaculture certification, described in Section 1.4.2, also cover a range of issues which are considered relevant: animal health and welfare; food safety and quality; environmental integrity; and/or social responsibility. In this case, however, the draft guidelines state that an aquaculture certification scheme may address one or all of these issues. This is reasonable, given the disparate nature of the four issues, and there is on-going debate about whether social responsibility should even be included in the guidelines. However, we note that the aquaculture certification schemes we have reviewed cover all of these issues to some extent already (this is not the case for the recommendation lists – see Table 11). It is therefore appropriate that social responsibility should be included in the scope of the FAO guidelines.

In summary, with respect to scope we consider inclusivity and comprehensive coverage to be good practice. If the criteria for a certification or listing become too specialised, or apply to only a limited aspect of the performance of the fishery or aquaculture operation being assessed, then the opportunity for misinterpretation by consumers is increased. Certainly it is important that the scope of any scheme is always clearly and accurately described and communicated.

With regard to procedural aspects, we also note that The FAO guidelines for both capture fisheries and aquaculture consist of three main components: setting of standards, accreditation of certifying bodies and certification to verify compliance with the standard.

The setting of standards is important in every case, irrespective of the level of detail and type of information that is being presented. As we have noted previously, a standard for a recommendation list that enables identification of both positive and negative issues is quite different to one that only sets a high standard that the fishery must attain. In both cases, a recognisable and testable standard must be clearly articulated if the reader is not going to be potentially misled.

The FAO guidelines for fisheries recommend that this standard should be set by a specialised standard setting body, or a technical committee of independent experts. The main fisheries certification schemes, including MSC and FOS, comply with this requirement; however, the level of independence among recommendation lists developed by NGOs is generally lower.

With respect to the verification of compliance with the standard, there is also a clear difference between the certification schemes and the recommendation lists. Assessments for the latter are generally compiled by the creators of the scheme themselves and not by independent bodies. .

To improve and promote both independence and transparency (see sections 4.1.3 and 4.1.5), we recommend that the creators of recommendation lists adopt similar procedures to the certification schemes, to encourage independent assessment and mitigate the potential for undue influence from wider campaign policy perspectives.

Key issues:

Certification schemes	Recommendation lists
• Should cover, for fisheries, the state of the stock, management system and ecosystem impacts; for aquaculture, environmental impacts, food safety and quality, animal health and welfare and social issues. • Certification schemes should incorporate independent standard-setting, accreditation and certification, with appropriate checks and with transparency.	• Should cover the same scope as Certification schemes. • Should have an independent standard setting procedure in line with FAO guidelines. • Should separate the assessment of fisheries and aquaculture operations from the standard setting body, for example through an independent body or group of experts.

4.1.2. Accuracy

Within our list of key attributes, accuracy is paramount. The information used to conduct assessments for certifications and recommendation lists should be comprehensive, up-to-date and well-referenced, from published and peer-reviewed sources wherever possible[75]. It should be used to draw accurate, unbiased and defensible conclusions about the status of a target stock, and the wider environmental impacts of a particular fishing method. This entails a significant amount of work on the part of those conducting the analysis. Each scheme must have a clear, scientific and documented procedure for accessing, processing, verifying, updating and presenting comprehensive and relevant information in a balanced, unbiased[76] way.

There is an obvious difference in the level of information used in the certification of fisheries and aquaculture operations and the compilation of recommendation lists; the latter involving much less detailed analysis of information. This is reflected in the resolution of the information presented to consumers (Section 4.1.4). However, we have also reported on significant variation in the way in which different certification schemes assess compliance with their standards, notably in the area of stock status (Section 3.3.2.1). In this regard, MSC certifications set the highest standard currently, using the most recently available stock-specific assessment results directly from fishery managers and stock assessment scientists, including a peer review of the stock assessment information. Analysis of certifications conducted under the FOS scheme by contrast show that some have been based on much more general stock information carrying a much higher risk of an inaccurate assessment of stock status. More recently, FOS has updated its certification criteria and has made improvements, in particular relating to the stock status.

An important element of maintaining accuracy is ensuring that the information presented is up-to-date. There are two issues involved: firstly, the most recent information available must be used in the

[75] By this we mean not only in peer reviewed literature; recognising much of the current information on which assessments are based appears only in the "grey" literature, we include here government stock assessment reports, fisheries management plans, environmental impact assessments, reports from Regional Fisheries Management Organisations and similar sources.

[76] The issue of the avoidance of bias is discussed in more detail under the key attribute of *independence*.

assessment of sustainability, and secondly there needs to be a clear procedure and timetable for updating the assessment as new information becomes available.

Using the most recent data available is generally achievable, providing due diligence is applied in the initial assessment, but a precautionary approach must be taken when the available information is significantly out of date. Three FOS certifications undertaken in 2008 had most recent data from 2002, a lag of six years.

An updating procedure, however, requires an on-going commitment to funding and undertaking of periodic checks for new information. There also needs to be a transparent process for modifying the conclusions of the assessment when new information warrants it and incorporating these changes in the recommendation list or certification outcome. An out-of-date listing can have obvious negative consequences — an improving fishery may not receive appropriate recognition in the market place for its achievements; conversely, when new information indicates that a previously green-listed or certified fishery is in decline, its status may need to be changed to maintain the credibility of the scheme. Generally, the certification schemes include such an updating process in their procedures – e.g. annual audits and a complete re-assessment every few years. However, procedures for recommendation lists are often less systematic. If there is no facility for on-going assessment and updating, perhaps due to lack of funding, then the recommendation list must include both a date of preparation and a date after which the information it contains is no longer reliable. Once the latter date is past, the list should be withdrawn from use. The period during which the information remains reliable is likely to vary between fisheries; however, based on the fact that certification schemes generally incorporate an annual audit, a one-year lifespan would seem to be a reasonable starting point. This may depend, however, on the frequency of stock assessments and/or environmental impact analyses. As a general rule, however, whenever new information of particular importance comes to light that significantly impacts the assessment of a fishery's status; this should be considered as soon as possible.

Communication and credibility are also important. Consumers must be confident that they are not being misled and they are making informed choices, particularly where it entails paying a price premium for one product over another. However, they cannot be expected to conduct their own investigation of claims made on product labels and in 'fact' sheets — they must be able to rely on the information being true, accurate and fairly presented. It is a prime responsibility of each scheme, therefore, to present accurate information in plain and unambiguous text. What is the difference, for example, between 'fished by sustainable methods', 'sustainably sourced' and 'sustainably fished', all of which can be found currently on package labelling or scheme descriptions? Consumers are unlikely to see a difference here, but clearly these three claims could mean quite different things. The first, for example, says nothing about the status of the fish stock and the second could be entirely unrelated to the act of fishing. In this particular case, providing it is accurate, we think the third example is preferable because it suggests that the fishing is being carried out in a sustainable manner.

Retailers have an important role in ensuring consumers are provided with accurate information. Where they use third party recommendation lists and stock products with ecolabels, they must first ensure that the claims made are substantiated. It is clearly in their interest to do this when using the information to guide their own sourcing policy. It is also, however, important that they apply the same level of scrutiny before passing on information that may influence the buying decisions of their customers. One can expect a certain degree of coordination here; for example, a retailer is unlikely to stock a product and then specifically endorse a recommendation list which includes that same product in the red, or 'do not buy' section. With respect to labels, however, retailers should only endorse those that have been shown to conform to the FAO guidelines, where applicable. Any schemes that do not meet these standards, or are found to be otherwise deficient in terms of accuracy, should be required to come up to standard, or should not be accepted.

Key issues:

Certification schemes	Recommendation lists
• Full and accurate information should be provided in a publicly available, clearly referenced report giving justification for the certification, or non-certification, of a specific fishery or aquaculture facility. The report should conform to the standards normally seen in the preparation of international scientific reports. Certification schemes must have an effective quality control process to ensure that certification outcomes are independent of which CB is conducting the assessment. • Information used should be the most recent available and in the case of fisheries should at least provide an assessment of stock status that is current, taking into account the generation time of the species and stock being assessed (for both target and non-target species). Where stock assessment results are used, they should relate specifically to the stock that is the subject of the certification. If no formal stock assessment is available, there should be a formal procedure for data-deficient fisheries that is demonstrably precautionary. For aquaculture facilities there should be access to the results of independent on-site verification and testing rather than just acceptance of company records/declarations as 'proof' of compliance.	• Recommendation lists are at best a summary of information available on a range of fisheries that are of particular interest to those who have compiled them. While the level of scrutiny applied to individual fisheries in the preparation of recommendation lists is typically less than for Certification schemes, the information in the lists should nevertheless be as accurate as possible. If information is not available, then this should be stated, rather than making conclusive statements that would suggest that it is. The lists must base their guidance on credible and verifiable information sources, comprising the best scientific information available. This may include reports prepared by certification schemes that come up to the same standard. • Recommendation lists should provide unambiguous and consistent guidance. Where there is conflicting information on a particular fishery or species, this should be stated rather than presenting only one side of the debate. Lists should be updated regularly, ideally at least on an annual basis.

4.1.3. Independence

Providing it is available to all fisheries that meet the standard, without discrimination, the decision of a fishery to seek certification is an active and voluntary decision. Organisations developing recommendation lists, by contrast, can assess any fishery they chose, without permission, and have the option of 'blacklisting' fisheries that don't meet their sustainability criteria. This can have far-reaching consequences for some fisheries (which of course is the intention of the list owner) and the responsibility to remain objective is significant. If a list is shown to provide inaccurate or imprecise information, it should be open and willing to change in order to maintain its credibility.

Schemes should not be influenced by industrial or political interests that might potentially bias the outcomes in a way that would mislead traders or consumers. In particular, any specific interests held by organisations that fund the schemes should not be allowed to weaken their independence and integrity. Where schemes are funded and/or run by organisations with broader marine campaigns (e.g. the larger NGOs such as Pew, Greenpeace and WWF) there is a risk that overarching campaign policy objectives may undermine the objectivity of the scoring methodology for red-listing or green-listing products. For example, Greenpeace have a policy to automatically red-list any fishery carried out using demersal otter

trawls, beam trawls or dredges, without considering the specific environmental impacts in individual cases. Certification schemes, including FOS and MSC, on the other hand consider the impacts of each fishery separately and have certified some fisheries that use these types of gears. While the former approach provides a simple message to consumers, the latter has greater scientific integrity, and produces a fairer and more independent result for the fishery.

Independence of fish information schemes is an important element of their credibility that applies at all levels of their development, governance and implementation. Avoidance of bias in the development of the listing criteria or certification standard must be supported by independent assessment. The FAO guidelines clearly favour independent accreditation of third party CBs to carry out assessments against the certification standards[77]. Not all of the schemes covered in this review meet this standard and it is specifically in contrast to the involvement of governments in Certification schemes, since certification for government-run schemes is usually carried out by government officials. Where a scheme is compulsory, it is reasonable for government to bear part of the costs of implementation, but some provision for the use of third party certifiers, perhaps accredited by government, would be beneficial. Among other things this would engage market forces to keep down the costs of certification.

Key issues:

Certification schemes	Recommendation lists
• The standard setting body should have an independent governance structure • Assessments must be conducted by third party CBs, accredited by an independent accreditation body. • Assessments against the certification standard are independent.	• Recommendation lists should be independent of wider NGO campaign objectives and focused on widely accepted definitions of sustainability. Where conclusions are different from those of other schemes, the question must be asked whether wider campaign objectives are influencing outcomes. If so, this should be made clear on the list, i.e. the information being provided is based on principles adopted by the organisation rather than an independent scientific analysis. • See specific recommendations with respect to the use of independent bodies and groups of experts for setting of standards and undertaking of assessments in Section 4.1.1 (Scope).

4.1.4. Precision

The issue of precision represents a clear divide between the Certification schemes and the recommendation lists. Certification is normally carried out on a clearly defined unit — whether it is an aquaculture facility or a specific fish stock targeted by a group of vessels operating to a fixed set of management requirements (e.g. the Loch Torridon Nephrops Creel fishery). In the case of recommendation lists, the resolution is much lower. The 'unit' that is listed is generally less well defined, for example a fish species or group of species sourced from a region, and perhaps by an identified fishing or farming method (e.g. skipjack tuna caught by pole and line in the Indian Ocean). The net result is that the advice provided in the lists is more general and may mask variations among

[77] The accreditation body should be independent and impartial and the certification body should be legally and financially independent from the owner of the ecolabelling scheme.

individual fisheries that are included in a general category. This can lead to inconsistencies between certifications and recommendation lists that are unhelpful to consumers and may have significant impacts on well-managed fisheries that should not be grouped together with other less well managed units. If the resolution of the list is such that differences are not detected and several fisheries — some good and some not — become tarred with the same brush, individual sustainable fisheries would need to absorb the costs of independent certification in order to demonstrate and benefit from their environmental and sustainability credentials.

Another aspect of precision is that where the certification involves labelling of products, there must be a certified chain of custody that ensures only fish from the certified unit are labelled as such. Schemes such as those run by FOS and MSC include such a requirement. Recommendation lists generally do not. Therefore it may be unclear to consumers which fish products are included in a particular listing (good or bad). The information available to consumers on packaging at the point of sale often does not help with this distinction – for example there is nothing specific about the ocean or region from which the fish were sourced and the precise species also may not be shown. If a recommendation list is to be provided to consumers there should be some coordination with the on-product description.

Key issues:

Certification schemes	Recommendation lists
• The unit of certification should be clearly defined and well delineated from non-certified elements. The origin of labelled products must be assured through a full chain of custody certification system.	• Where a grouping covers a range of possible fisheries, and more detailed information exists on one or more of the constituent parts, the more detailed information should be included on the list, particularly where that information derives from a certification assessment, and provides an assessment that is different from the more general advice.

4.1.5. Transparency

To maintain credibility, there must be a high level of transparency at all stages in the process of developing and implementing the schemes. The FAO guidelines state that transparency 'should apply to all aspects of an ecolabelling scheme including its organisational structure and financial arrangements'. This should extend equally to the owners of recommendation lists.

Allowing for stakeholder consultation in the development of the standard, or criteria for listing, helps to engage those outside the organisation in a dialogue at an early stage and thereby promote transparency and mitigate the possibility of organisation-specific biases making their way into the process. Some organisations may nevertheless choose to impose their own principles on the standard (see Section 4.1.3), in which case the organisation must be transparent in communicating this non-independence to consumers. The source of the influence (funding or otherwise) should also be made clear. Such organisations must also be prepared to answer to any elements of the seafood supply business that may be specifically disadvantaged by the information they are providing to consumers and other decision-makers.

Transparency should be maintained throughout the process of implementing the scheme. For certification schemes this includes publication of preliminary information on fisheries and aquaculture units to be assessed, so that stakeholders may provide timely input into the process, as well as the

publication of assessment reports prior to the certification decision being taken. In the case of recommendation lists, the full assessment (i.e. scoring against criteria) for fisheries should be made publically available for comment. This will enable independent assessment of any claims being made with respect to the scheme itself, and the fisheries and aquaculture operations being assessed. Once a certification or listing decision has been taken, the meaning of this must be clearly articulated to interested parties so that there is no uncertainty about what was and was not included in the assessment that lead to the final decision.

Key issues:

Certification schemes	Recommendation lists
• All fishery and aquaculture operation assessments should be made publicly available on a time frame that allows for effective stakeholder input into the process, including an objections procedure prior to a decision on certification. The objections procedure should be fair and equitable to all parties, to allow reasonable hearing of all concerns, but also to ensure that a decision on certification cannot be held up indefinitely once the correct procedure has been followed and a final decision taken.	• Scoring criteria should be publicly available, as should the scoring for individual fisheries and aquaculture units. • Any organisation-based policy that impacts the guidance provided to consumers should be clearly explained along with the list (see also Section 0).

4.1.6. Standardisation

Whilst it is not realistic to expect all certification schemes to address exactly the same issues, where possible, greater standardisation and harmonisation between schemes should be encouraged and welcomed by their owners. This would enable increasing recognition of equivalence between standards and would be a measure that would facilitate business for industry; complying with one sustainability standard would be sufficient, rather than having to go through the expense of numerous assessments against various standards. This is already happening in the organics sector where certification under one scheme normally leads to that product's "organic" status being recognised by all.

Whilst the differences between fisheries Certification schemes are probably too great currently to expect recognition of equivalence in the near future, this should be a longer-term goal to work towards. This process should be greatly facilitated by the FAO guidelines. Likewise, for recommendation lists, the development and application of common methodologies for scoring and compiling the lists would help minimise the consumer confusion that already exists surrounding sustainable seafood.

Quality control of certifications is necessary to ensure consistent application of the certification standard. In the first instance, this is a key role for the accreditation bodies in their assessment of CB performance. On-going standardisation can be effectively supported through the development of clearly defined, standard performance indicators and provision of additional guidance for CBs in conducting assessments. Regular communication with, and support for, CBs is an important part of this process, including the provision of technical advice on specific cases where a detailed interpretation of the standard may be needed for a particular fishery. This is becoming increasingly important as schemes seek to use ever-more sophisticated techniques to incorporate different kinds of information, such as those used in risk-based assessments.

Key issues:

Certification schemes	Recommendation lists
• Certification schemes should work towards more harmonised and equivalent standards based on FAO guidelines. • There should be effective quality control of assessments to ensure consistent application of the standard to individual certifications.	• Development of common methodologies and scoring systems for compiling lists. • Quality control of scoring to ensure consistent application to individual species assessments.

4.1.7. Cost-effectiveness

Cost-effectiveness is more of an issue for Certification schemes than for recommendation lists, although NGOs certainly have their own internal budgetary and cost-effectiveness concerns to consider when developing such work. For Certification schemes, there is a balance to be found between the scheme being comprehensive and robust, and the cost involved in assessing against a wide range of detailed criteria. A very complex scheme that requires a large amount of detailed information for the assessment may become too expensive to be accessible for the industry, and thus will fail to achieve its objectives since it will not achieve the necessary uptake. On the other hand, a scheme which is very simple and has an assessment procedure that is quick and easy to implement, and is therefore less costly, may not be sufficiently robust to inspire and maintain the confidence of industry, retailers and consumers, and thus will also fail to achieve its objectives.

Certification costs need to be kept under control to avoid costs becoming too high such that certain fisheries (e.g. small-scale fisheries or fisheries in developing countries) are priced out of the system and cannot benefit from certification. However, there may also be donor or grant funding available to help such fisheries meet certification costs.

Partnerships between producers, processors and retailers to share the costs of certification would help ensure an equitable distribution of costs. Where producers bear most of the cost of certification, ensuring that certified fisheries reap benefits from certification, for example through a (first-sale) price premium or more secure outlet for their catch, would help fisheries reap the benefits from certification. Recommendation lists can also contribute to this by recognising certified fisheries on their lists.

Key issues:

Certification schemes	Recommendation lists
• Ensure that the assessment process is robust and detailed enough to be credible, but also that the cost is kept accessible for different types of fishery around the world.	• Ensure that recommendation lists recognise certified fisheries and do not contribute to undermining certification.

4.2. Recommendations and future challenges

Fish sustainability information, incorporating ecolabels, recommendation lists and companies' own sourcing policies, is a rapidly-evolving area and changes have been observed even during the course of this review. A number of challenges are emerging, which are summarised below along with recommendations for future improvements in the sector.

Assessment of capture fisheries schemes against the FAO Guidelines. The FAO guidelines for ecolabelling in fisheries are widely recognised as the benchmark for fish sustainability information schemes. As we have seen in this review, the guidelines are usefully applied not just to ecolabelling and certification schemes, but also to recommendation lists. Several schemes of both types have now undertaken internal assessments of their level of conformance with the guidelines. These assessments and any resulting changes to the schemes arising should be made publically available. All of the schemes that we reviewed addressed the three main areas of minimum substantive requirements to some degree but there were some significant deficiencies with respect to the procedural guidance on standard setting, accreditation and certification. The sector is showing a willingness to self-regulate to maintain standards and credibility, however, interpretation of the level of conformance with the requirements among schemes remains subjective and significant differences of opinion remain. For example, FOS claims to be the only scheme that is compliant with Article 30 (regarding not certifying overfished stocks). Our assessment is that not only is FOS not yet fully compliant with the guidelines, but the claim with respect to not certifying overfished stocks is misleading, since there are instances when overfished stocks can be certified under the FOS standard (see section **Error! Reference source not found.**). We see a need, therefore, for a more routine, objective and transparent assessment of fish sustainability information schemes relative to the guidelines.

The application of the guidelines to recommendation lists needs to be formalised. While we have seen that they can be applied to a large extent in their current form a formal assessment should be undertaken as part of future reviews of the guidelines.

Completion of the FAO draft aquaculture guidelines. The FAO guidelines for aquaculture should be completed and finalised as soon as possible. The aquaculture guidelines are still in development and are expected to have a similar weight to the marine capture fishery guidelines once approved. However, there is ongoing discussion regarding their scope. Debate continues regarding the inclusion of animal health and welfare and social issues. It is also undecided whether, in order to be deemed to be in conformance with the guidelines, a scheme will need to cover all of the four areas (animal health and welfare, social issues, environmental integrity and food safety and quality) or will be able to select just one or more.

All the aquaculture certification schemes we reviewed include social issues. It therefore makes sense for social issues to be included in the guidelines. Omitting them would leave this aspect of certification without any kind of benchmark, giving rise to a variety of criteria and standards, and lack of clarity for industry and consumers. In relation to animal health and welfare, these are key issues that consumers would expect to be included in a certification scheme covering aquaculture, as an animal production system. It is therefore appropriate to include it in the guidelines.

With respect to the implementation of the guidelines (i.e. whether the four areas are compulsory or separable), this is significantly impacted by the inclusion of food safety and quality. While these are fundamental issues for the supply chain, they are essentially standard requirements in the food industry and therefore offer little potential for product differentiation in an ecolabel. It is therefore not surprising that these issues are common in the standards developed by trade organisations (e.g. GlobalGAP and GAA), but not in the more consumer-oriented 'eco'-labels (e.g. FOS and Naturland).

The need for greater regulation. The FAO guidelines are a significant step towards higher standards in ecolabelling of fish products, but the question remains as to whether additional regulation is needed to mitigate the potential for proliferation of misinformation that may undermine the efforts of responsible elements in the industry to support sustainable fishing and aquaculture practices. At this stage we think it would be premature to go beyond the voluntary standards and efforts at self-regulation that currently exist. As indicated above, the development of a more formal process for assessing conformance with the guidelines would be a useful step further, and it is important to keep the situation under review to ensure that existing schemes continue to improve, and any new schemes meet the same standards. However, with time and in the future there may be a role for an organisation to coordinate greater harmonisation amongst the schemes, such as the role IFOAM fulfils in the organic sector.

Certification Schemes or recommendation lists? There are clear and significant differences between certification schemes and recommendation lists, even though both purport to encourage informed choices about sustainable seafood. Certification schemes are the more targeted approach, following specific products from the capture or culture to the retail outlet. Recommendation lists provide a more general picture and have the potential to cover a greater range of products more cheaply and more quickly than certification schemes. However, they can also give rise to significant consumer confusion, particularly when they provide information that contradicts other lists or certifications. They each have their pros and cons, but from the consumer perspective we see great advantage in certification and ecolabelling because of its direct and unambiguous signal to the potential purchaser (providing of course the scheme itself conforms to FAO guidelines). Both certification schemes and producers of recommendation lists (specifically NGOs) should enhance their consistency and credibility by seeking greater standardisation and harmonisation. Where findings, and hence listings conflict, the list owners should seek to resolve contradictions. Recommendation lists should align themselves better with the information provided by certification schemes where it is available, and be more precise in their advice where it is not. This will enable increasing recognition of equivalence between standards and will simplify procedures for industry; complying with one sustainability standard would be sufficient, rather than having to go through the expense of numerous assessments against different standards.

Increased objectivity. The other significant issue that currently arises with recommendation lists prepared by NGOs, but could apply equally to a certification scheme, is the problem of bias. As we have discussed, recommendation lists have often been developed by NGOs as part of broader marine conservation campaigns and may be significantly influenced by their campaign objectives and major donors. In line with FAO guidelines, recommendation lists should have an independent standard setting procedure and should distance themselves from the assessment of fisheries and aquaculture operations against their standard, for example through the establishment of an independent assessment body or group of experts.

Reducing consumer confusion. As fish sustainability information schemes have proliferated, so the potential for consumer confusion has increased. Inconsistencies between recommendation lists, the disconnect between fish categories on the lists and what consumers see on the retail shelf, and a variety of ecolabels covering either aquaculture or capture fisheries or both, all with relatively low brand recognition, are all issues that need further attention. It is in the interest of the owners of recommendation lists to seek greater consistency; inconsistencies only undermine consumer confidence in the information being provided. All schemes should seek to achieve and practice greater equivalence to reduce inconsistency and consumer confusion. This should be a reasonably expectable outcome as schemes align themselves better and more transparently with the FAO guidelines.

A mechanism of pro-active information sharing between schemes would be beneficial. Lists should also provide information that is more directly useable by consumers when choosing between products on the shop floor. While competition between ecolabels is likely to be beneficial for the industry and ecolabels should be free to develop their own brands, the potential for increased standardisation in

product labelling to make it clear what a particular certification means should be investigated. Large volume retailers are well placed to play a significant role in this regard, including a clearer alignment of their sustainability claims on their own products with those of third party suppliers.

Better access to certification for developing country and small scale fisheries. Whether it is because the certification process is costly, or the information needed to achieve certification is not available, a large number of fisheries, particularly those in developing countries, are currently marginalised in the move towards more ecolabeling. This can lead inadvertently to trade barriers that create even greater problems for already struggling producers. Certification schemes and recommendation lists should continue their efforts to improve the applicability of their schemes to products from small-scale and data-deficient fisheries and aquaculture operations (particularly those in the developing world) so that these products do not suffer unintentional market access barriers. Current initiatives include the development of less data-oriented assessment methodologies and efforts to reduce costs. Other initiatives may also be possible, for example through commercial and/or donor funding to support fisheries improvement plans. These initiatives should be given a high priority.

Increased market penetration and consumer awareness. The penetration of labels and the influence of lists in European countries, particularly those where seafood consumption is high are currently low. Issues of freshness, quality and price are more significant for consumers who habitually eat fish. In part this may be related to a generally low availability of labelled product, as evidenced by Wal-Mart's need to modify its MSC sourcing commitment, as well as a lack of consumer awareness or concern for sustainability issues. Although the amounts of fisheries production quoted as being currently under certification, or in the process, are high, the amount of labelled product on supermarket shelves needs to substantially increase for brand recognition to improve.

Role of Retailers. With the increasing number of certification schemes and lists, with a variety of sustainability claims, and consumers' general lack of awareness of labels and fish sustainability issues, retailers must increasingly take on the responsibility for selecting and promoting "good" ecolabels on behalf of consumers and developing and coordinating their own responsible sourcing policies.

New criteria. As is the case for many science based processes, including the assessment of fisheries sustainability, the scope of sustainability criteria used by certification schemes and recommendation lists is expanding. As our understanding of human impacts on natural systems improves, so the need for a more holistic approach to support genuinely ethical sourcing is increasingly recognised. Examples of new criteria include impacts of land based processing, labour standards and animal welfare and food miles[78]. As issues of climate change, carbon footprint and Life-Cycle Analysis[79] (LCA) continue to gain prominence, additional criteria for labelling will arise and guidelines for certification will be needed. This is, however, a double edged sword, because additional criteria will inevitably lead to greater complexity, and ways of communicating this to the consumer in a form that enables assimilation and does not add to confusion will need to be found.

[78] Greenpeace did investigate fuel efficiency but the complicated nature of the issue resulted in it not being possible to be included; FOS also includes criteria on reducing energy use and carbon footprint, although the boundaries for assessment are not clear.

[79] According to Wikipedia the term 'life cycle' in Life Cycle Analysis refers to the notion that a fair, holistic assessment requires the assessment of raw material production, manufacture, distribution, use and disposal including all intervening transportation steps necessary or caused by the product's existence. The analogy for fisheries would be to consider all impacts of the production and supply process, from the construction of the fishing gear, the capture of the wild fish (including any use of bait), and processing through to the delivery to the consumer. In the case of aquaculture this would be similar, except that the production process is different and includes all aspects of the supply, construction and commissioning of the aquaculture facility, through stocking, growing, and harvesting.

Our hope is that uptake of these recommendations will lead to a reduction in consumer confusion surrounding which fish to eat and which to avoid and a growth in confidence throughout the supply chain in the benefits of genuine sustainable sourcing. Our study observed a high level of consensus in both commercial seafood firms and the NGO community regarding the importance of these schemes, and a strong level of commitment among all parties to a sustainable future for the oceans. The challenge now is to maximise the value of fish sustainability information schemes in contributing to this overarching goal by providing consumers and businesses with clearer, more accurate and more recent data, so that they can make properly informed choices about seafood.

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Annex 1: Detailed Review of Selected Fish Sustainability Information Schemes

This annex presents detailed information on the schemes reviewed during this study.

CERTIFICATION SCHEMES

Friend of the Sea
Marine Ecolabel Japan
Marine Stewardship Council
Global Aquaculture Alliance
GlobalGAP

ORGANIC CERTIFIERS

Naturland

NATIONAL STANDARDS

Australian Government Department of Environment, Water, Heritage & the Arts
Thai Quality Shrimp

RECOMMENDATION LISTS

Australian Marine Conservation Society (AMCS)
Greenpeace
Marine Conservation Society (MCS) UK
Monterey Bay Aquarium — Seafood Watch
NOAA Fisheries FishWatch
The North Sea Foundation: Goede VIS
Sustainable Fisheries Partnership
WWF International
WWF Hong Kong

SUPERMARKETS

Review of Carrefour, Tesco and Wal-Mart
Review of supermarket websites

FRAMEWORK FOR THE REVIEW

1. Certification Schemes

The prevalence of ecolabelled seafood on the market is increasing, and a variety of different labels are emerging in different countries. An ecolabel is a distinctive logo or statement which indicates that the fish has been harvested or produced in compliance with conservation and sustainability standards. Ecolabelling schemes set their own standards, against which fisheries and aquaculture operations can be assessed. If these are met, they are awarded the right to use the scheme's logo on products originating from the fishery or aquaculture operation. An important aspect of ecolabelling schemes is that they also include verification of a chain of custody from point of production to point of final sale that ensures that only product originating from approved fisheries/aquaculture operations bear the logo of the scheme. Third party certification is considered the most robust type of assessment process. This involves the main organisation establishing the criteria for certification (the standard), and independent, accredited 'certifying bodies' conducting the assessments which determine whether or not a fishery/aquaculture operation meets those criteria. This is the arrangement which the FAO guidelines set out for ecolabelling and certification schemes.

1.1. Friend of the Sea

1.1.1. Background

Friend of the Sea (FOS) is an international third-party organisation registered in Italy with a branch in Canada and offices in the USA, Switzerland and India, that provides certification for products from fisheries and aquaculture compliant with its sustainability criteria. It is an independent, non-profit organisation that provides information, primarily to consumers, through labelled products in supermarkets and through their website, as well as to companies at various meetings and conferences. It is a voluntary and market-driven scheme. Certification of products from sustainable fisheries and aquaculture is the primary activity of the organisation, which does not deal with certification of other products or types. FOS certifies fisheries and aquaculture operations worldwide, in both developed and developing countries. In addition to seafood products, its certified products also include fishmeal, fish oil, fish feed and omega-3 supplements.

FOS-certified products are sold in a range of markets; FOS reported as at May 2009 that 600 products are marketed in 26 countries[80]. The largest number of species and product lines are sold in Italy, followed by Switzerland and Spain, but products are also sold in Australia, Europe (Belgium, Czech Republic, France (including Guadeloupe, Martinique and Reunion), Germany, Greece, Luxembourg, Poland, Portugal, Romania, UK), Guyana, Japan, Mauritius, Mayotte, New Caledonia, Norway, Turkey and the USA[81]. The products sold in the largest number of countries and with the largest number of lines are sardines, mackerel, salmon, shrimps and fish meal. Other products include tuna, anchovies, clams, cuttlefish, squid, seabream, seabass, rainbow trout, turbot, mussels, swordfish, kingfish, halibut and fish oil.

There is active promotion of the scheme in addition to the website — the Director, Paolo Bray, regularly presents at conferences and meets one-to-one with industry representatives to promote the scheme and provide support to possible new clients. For example, a 'Friend of the Sea Day' was held on 27 April 2009 in Brussels, shortly before the Seafood Expo.

[80] *Pers. comm.*, Friend of the Sea. Own analysis from information on FOS website as at June 2009 indicated 423 product lines in 25 countries; however this may underestimate the number of lines because: information on the website may not be up-to-date and different weight packaging of the same product were not counted as separate product lines.

[81] Information on countries where products are sold, number of lines etc taken from FOS website (http://host1.bondware.com/~fos/news.php?viewStory=96), 12 June 2009.

1.1.2. What do they claim?

Friend of the Sea claim to support 'the conservation of marine habitat by means of market incentives, in particular the certification and promotion of sustainable seafood and products from sustainable fisheries and aquaculture'. Standards include social and environmental criteria, but compliance with organic or 'good health' criteria is not part of Friend of the Sea's mission. Fisheries targeting any species can be assessed and potentially can be approved. However there must be a stock status or state of exploitation determination of the species in the FAO area in which the fishery takes place. Species that do not have such a state of exploitation determination by FAO, a Regional Fisheries Management Organisation or national marine research agency are considered data-deficient and cannot be certified.

Species certified include anchovies, clams, cockles, cuttlefish, wild and farmed cod, halibut, kingfish, lobsters, mackerel, menhaden, mulloway, mussels sardines, wild and farmed salmon, wild and farmed shrimp, seabass, sea bream, sole, squid, tuna and turbot. FOS claims to be the only scheme in the market which complies with Article 30 of the FAO fisheries ecolabelling guidelines in that they will not certify overexploited stocks.

FOS is planning an internal assessment against the FAO ecolabelling guidelines in 2009.

1.1.3. How do they do it?

Standard setting

FOS is governed by a President (Franco Bray) and Director (Paolo Bray). An Advisory Board made of mainly representatives of NGOs and seafood consultants in the USA, Canada, India, Switzerland and UK, initially established the certification criteria, and also provides strategic advice.

The standard-setting procedure on the website states that the Technical Committee is an independent standard-setting body, made up of representatives from five continents[82]. The Technical Committee is 'open' and anyone with an interest in the seafood, fish feed/fish meal fields can apply to be a member of the Technical Committee. It is made up of representatives from a range of organisations, including NGOs, research institutes, seafood industry and government. There are currently 26 members.

The Technical Committee can propose and vote on modifications to the criteria. The Technical Committee does not meet in person but proposed changes are discussed and voted online, based on a majority vote by an established deadline, at any time a proposal is made by one of the members of the Technical Committee. There is no quorum mentioned for the voting procedure[83]. Anyone wishing to influence or have input to the standard-setting process must become a member of the Technical Committee — there is no additional outreach to interested stakeholders, although it is noted that modifications to the standard were introduced in response to Greenpeace's suggestions.

The Standard

Friend of the Sea aim to achieve their goals by assessing and certifying fisheries and aquaculture facilities against their standards. FOS refers to the standards as 'criteria'. 'Sustainability' is defined by the criteria, hence a fishery which complies with the criteria is considered sustainable. Criteria have recently been updated and improved (January 2009, approved March 2009), in part by integrating recommendations from Greenpeace.

For **fisheries**, the updated criteria include:

- **Stock status** (fishery must not be overexploited, depleted, recovering or data deficient). This is assessed using: FAO stock status information; Regional Fishery Body; or national marine research authority information. There is no evaluation or peer-review of the quality of the stock assessment data on which the assessment is made, since FOS claims its role is not to 'assess official fisheries

[82] Information from website, posted 15 November 2008. http://host1.bondware.com/~fos/news.php?viewStory=136

institutes' stock assessments'. Table 15 summarises the source of stock status information used in the available audit reports. Six out of fourteen fishery audits available on the website used the FAO state of exploitation information from the 2005 publication 'State of world marine fishery resources' in their determination of 'stock status' for the fishery being certified (three used this as the only source; three used it together with other sources)[84]. Such information is at least three years old (the most recent catch data in the 2005 publication is from 2002) and since this publication has not been updated since 2005, the information is now at least seven years old. In determining stock status, the 'state of exploitation' annotation is used, which is given for certain species or species groups by FAO statistical area. However, FAO themselves caution against the use of this information for fisheries management purposes as they are intended as 'rule of thumb' indicators only and often aggregate information from more than one stock or sub-stock[85]. In some audits, more relevant stock status reports have been used, such as from ICES, the US National Marine Fisheries Service and RFMOs. However, some audit reports did not include information on all the species under consideration in the audit, and in some cases genera or family groups were used rather than species-level information. Little information on specific stock status indicators such as fishing mortality, biomass, limit reference points etc. were found in some of the audit reports. A further criterion is that the target species is not included on the IUCN Redlist of endangered species.

- **Habitat impacts** (gears cannot impact the seabed unless impact is negligible. For trawl fisheries protected areas must be established and by-catch reduction devices in place).
- **Selectivity** (discard levels maximum 8% by weight, management plan in place to close the fishery when high proportions of undersized or juvenile individuals are caught).
- **Legal compliance** (fishery respects TACs, no IUU, no flag of convenience vessels, meets national and international regulations).
- **Management criteria** (follow FAO Code of Conduct, Precautionary Principle, incorporate a monitoring and research process for environmental and social impacts). FAO guidelines require an assessment of whether the data collected under the management system are adequate for evaluation of the current state and trends of the stocks, and whether an effective legal and administrative framework is established and compliance is ensured. These aspects are not fully addressed in the FOS criteria.
- **Social accountability** (follow International Labour Organization conventions, pay fair wages).
- **Fuel efficiency and waste management**.
- **Traceability**.

The updated criteria[86] have improved on the previous criteria (previous criteria were obtained from assessing a selection of audit reports[87] from 2008). The previous criteria were substantially fewer than the updated ones, which incorporate more requirements in particular relating to the stock status (increased from two criteria to seven) and management system (increased from three poorly-defined criteria to eight). The updated criteria broadly fulfil the requirements in the FAO guidelines, addressing

[84] A further audit did not present any stock status information.

[85] FAO states 'A certain degree of care must be taken in interpreting these annotations because they are given on a species-by-species basis, often aggregating many stocks or sub-stocks, rather than for individual stocks. It is typically the case that within each FAO statistical area the catches of a given species will come from two or more distinct stocks. It is often the case that the state of exploitation of such separate stocks is different. In such instances the "state of exploitation" indicators in the table should be checked against the main narrative within the appropriate "resource status and management" section for further details. Given this distinction between species and individual stocks, it can be seen that the "state of exploitation" notes have limited statistical significance from a fisheries management point of view and are intended as 'rule of thumb' indicators only.' (FAO, 2005–2009b). In several cases checked, there was no further information in the 'resource status and management' section regarding the stocks under consideration.

[86] Accessed from FOS website on 10.02.09 at http://fos.bondwaresite.com/photos/Checklist_Friend_of_the_Sea_Wild_Caught_2009.doc and http://fos.bondwaresite.com/photos/Friend_of_the_Sea_Checklist_Farmed_Products_English_17112008.doc.

[87] A random sample of audit reports was selected for detailed review: Vietnam cuttlefish, Fish meal, Madagascan shrimps and Indonesian shrimps.

the stock status, management system and ecosystem considerations. This demonstrates that FOS are keen to continuously improve their criteria based on stakeholder feedback.

Three audits have been carried out using the updated fisheries criteria (as of April 2009) — a mixed fishery in New Zealand, a tuna pole and line fishery in South Africa and a Dutch sole gillnet fishery — and a further three fisheries are under audit.

Slow-growing and forage species are included in the certifications. FOS have certified fish meal and fish oil produced from forage species; the audits did not assess potential impacts on the food chain, but the updated criteria do include impacts on the food chain for forage species[88]. The updated criteria will be applied during future surveillance audits.

[88] Criteria 1.6: 'Positive target reference points are set … for fishing levels that allow restoration to, and maintenance of stocks at, a plentiful level that considers both human use and ecosystem as a whole … particularly important … for forage fish (such as herring, menhaden, squid, and krill) which are abundant but whose populations fluctuate widely under various environmental influences, are key prey for many larger marine species, and therefore require considerably more precautionary management. To achieve this goal, target stocks should be maintained at a high proportion of the biomass that would occur in the absence of fishing.'

Table 15 Stock status information sources in FOS audits

Fishery	Species and area/stock referred to in stock information	Date of audit	Year of stock status info	Source of stock status information	Comments
Croatia, anchovy purse seine fishery (European anchovy, *Engraulis encrasicolus*)	Anchovy, North & Central Adriatic (incl. Croatia)	2007	1976-2002	Cingolani *et al.* (2003)	Stock status information OK — refers to relevant species and area, but a little out-of-date
Turkey clam dredge fishery (clam, *Venus gallina*)	None	2008	n/a	None	Audit states that assessment methodology is by the government for all clam fishing areas in Turkey and 'assures long term sustainability and fishing within the maximum sustainable yield'.
Portugal (Azores) demersal fishery (various species)	Various (relevant species) in the Azores	2006	1995-2004	'Scientific surveys data' by the Dept of Oceanography and Fisheries of the University of the Azores	Stock status data-deficient – not stock assessments but based on evolution of 'relative population numbers' trends.
Vietnam squid & cuttlefish fishery (handlines & hand nets) (*Loligo chinensis, L. edulis, L. formanosa; Sepia pharaonis, Sepiella japonica)*	Loligo spp, Sepidae and Sepiolidae in FAO Area 71 Western Central Pacific	2008	2002 (latest catch data)	FAO (2005b)	Stock status information inadequate – not specific to species or stock under consideration in the audit and assessment is out-of-date.
Morocco sardine & mackerel fishery ('fish meal' audit) (*Sardina pilchardus & Scomber japonicus)*	*Sardina pilchardus & Scomber japonicas* in FAO Area 34 Central Eastern Atlantic, and 34.1.1.1–34.1.1.3.	2008	2002 and 2004	FAO (2005b) and FAO FIRMS reports (2002 & 2006)	Stock status information OK; FIRMS information provides better resolution and more up-to-date source than FAO 2005b.
USA menhaden fishery ('fish meal' audit) (*Brevoortia tyrannus, B. patronus*)	*B. tyrannus* in US Atlantic only. No information on *B. patronus.*	2008	2005	AMTC (2006), FAO (2005b).	Good stock status information for one species (Atlantic menhaden), no information provided for the other species (Gulf menhaden).
Canadian salmon fishery (Chinook, Coho, Sockeye, Chum and Pink salmon)	Chinook, Coho, Sockeye, Chum and Pink salmon, specific stocks of each species	2007	2007	Canada Dept of Fisheries and Oceans, 2007 Salmon Stock Outlook	Good stock status information for all species under consideration, recent data.
Indonesian trammel net prawn fishery (*Metapenaeus ensis, P indicus, P. monodon*)	Penaeus spp for *P. indicus P. monodon*, for FAO Area 71 Western Central Pacific. No data on *M ensis.*	2008	2002	FAO (2005b)	Stock status information inadequate. Not specific to the species nor stock in question. Old data. *M. ensis* is data deficient and *P. monodon* is considered 'fully to over-exploited' in the source used.

Fishery	Species and area/stock referred to in stock information	Date of audit	Year of stock status info	Source of stock status information	Comments
Madagascar shrimp trawl fishery (*P. indicus, P. monodon, P. semisulcatus, M. monoceros*)	*P. indicus,* Penaeus spp. in FAO Area 51 Western Indian Ocean; 'shrimp stock' in Madagascar shrimp fishery.	2008	2002	FAO (2005b), FAO (2006)	Stock status information inadequate. FAO 2005b does not provide species- or stock-specific information and is out-of-date. FAO 2006 states the 'recent reduction of the average size of the catch in shrimp fishing indicates a slight over-exploitation' yet the fishery was still certified.
Norway shrimp trawl fishery in the Barents Sea (*Pandalus borealis*)	*Pandalus borealis* in Barents Sea, ICES Div. I and II	2008	2007	ICES (2007)	Stock status information good – refers to species and stock targeted and is recent.
Ireland albacore fishery, Porcupine Bank (*Thunnus alalunga)*	*Thunnus alalunga* North Atlantic Stock	2008	2007	RFMO: ICCAT Report 2006–2007 (II)	Stock status information good (refers to species and stock under consideration, and is recent), but auditor's interpretation is incorrect – stock is overexploited ('SSB currently 20% below the MSY level').
Senegal pole & line tuna fishery (*T. albacares, T. obesus,Katsuwonus pelamis)*	*T. albacares, T. obesus,Katsuwonus pelamis* in the Atlantic.	2008	2002–2004	FAO (2005b) and Tuna-org (2007)	Some concerns over stock status information. Exploitation indication taken from a tuna RFMOs report, which does not contain detail of the stock assessments. Skipjack (*K. pelamis*) is data deficient.
Sri Lanka yellowfin fishery (*T. albacores*)	*T. albacores* in the Indian Ocean	2008	2004	Tuna-org (2007)	Some concerns over stock status information. Exploitation indication taken from a tuna RFMOs report, which does not contain detail of the stock assessments.
Philippines tuna, blue marlin and swordfish pole & line fishery (*T. albacares, Makaira mazara, Xiphias gladius*)	*T. albacares* in the Western Central Pacific only. No information on *Makaira mazara* or *Xiphias gladius*	2008	2006	WCPFC (2007)	Stock status information OK for yellowfin (species and stock in question, recent), but no information is provided on blue marlin and swordfish.

References (N.B.FAO (2005b) included in main report reference list):
AMTC (2006) Stock Assessment Report for Atlantic Menhaden, a report prepared by the Atlantic Menhaden Technical Committee for the Atlantic Menhaden Management Board. Atlantic States Marine Fisheries Commission.
Cingolani, N., Kariš, T., Sinovčić, G., Kapedani, E. (2003) Anchovy (Engraulis encrasicolus, L.) stock assessment in the Adriatic Sea: 1975-2002. Paper presented at the GFCMSAC Working Group on Small Pelagic Species (Tangier, 12th-14th March 2003). FAO-MiPAF Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea. GCP/RER/010/ITA/OP-09. AdriaMed Occasional Papers, 9: 12 pp
FAO (2006) Review of the state of world marine capture fisheries management: Indian Ocean. Edited by Cassandra de Young. FAO Fisheries Technical Paper No 488. Rome: FAO (Country review: Madagascar).
Tuna-org (2007) Report of the Meeting of Tuna RFMOs. January 22 –26, 2007. Kobe, Japan.
WCPFC (2007) Stock assessment of yellowfin tuna in the western and central Pacific Ocean, including an analysis of management options. WCPFC-SC3-SA SWG/WP-01. Western Central Pacific Fisheries Commission - Scientific Committee Third Regular Session, 13-24 August 2007. Honolulu, United States of America.

The criteria for **aquaculture** have also been recently updated. Criteria include:

- **Siting** (EIA carried out, no net conversion of critical ecosystems).
- **Broodstock and seedlings** (dependency on wild-caught broodstock is minimised and is only allowed if the species is not overfished).
- **Infrastructure** (measures to minimise escapees to the wild).
- **Use of drugs, chemicals and hormones** (prevention of diseases, maintenance of water quality, drugs only used for specific problems, no GMOs or growth hormones allowed).
- **Feeding criteria** (high feed utilisation rate, partial substitution of fish flour and oils with vegetable flours and oils, minimise wastage).
- **Water and waste management** (effluents treated and discharge water meets legal quality standards, water quality and impacts monitored, mitigation of pollution).
- **Energy management** (energy consumption minimised), transport (avoidance of air-freight or CO_2 offsetting), hazardous material (use of toxic chemicals prohibited), management system (control of documents, monitoring etc), fuel efficiency.
- **Social criteria** (no child labour, no forced labour, wages must meet legal standards).
- **Species-specific criteria**.
- **Traceability**.

The aquaculture criteria broadly cover most aspects of the draft FAO guidelines, except for food safety and quality which are not part of FOS's scope. Animal health and welfare, environmental integrity and social responsibility are all covered to some extent. Animal health and welfare is covered in 'use of drugs and other chemicals' regarding the prevention of diseases, maintaining good water quality, use of drugs only when clearly justified (although there is no requirement to use only *permitted* chemicals, drugs and antibacterials, and no requirements relating to stress and suffering of animals during culture, harvest, transit etc., or reference to the OIE Aquatic Animal Health Code). Animal Welfare is also outside the scope of FOS criteria. Environmental integrity is covered in criteria requiring an EIA to be carried out, infrastructure to minimise escapees, minimise dependency on wild broodstock, feeding procedures that minimise pollution through high utilisation rates and avoiding overfeeding, effluents must meet legal quality standards, water quality monitoring which must not show decrease in oxygen concentration, increase in nutrients etc., and mitigation of pollution. Social responsibility is covered in relation to requirements for no child labour, no forced labour, wages meeting the legal standards, and respecting national and international labour legislation. However the criteria do not cover development among rural communities or gender issues. Fair Trade issues are outside the scope of FOS.

The **FOS standards** are presented in two documents that list the criteria for fisheries and aquaculture respectively. This is one-and-the-same document that is used as the 'check list' by auditors for carrying out audits to assess compliance with the criteria/standard. However, some criteria are not clearly defined, and lack specific parameters to assess compliance. This seems to have resulted in criteria being interpreted in different ways by different auditors[89]. In other cases, it is not clear how compliance with the criteria should be assessed. For example, the criteria in the management system section (old criteria) 'the organization should operate following the Precautionary Principle', the justification given in several audits was that the country involved had adopted the Code of Conduct for Responsible Fisheries 'and thus also the Precautionary Principle', but there was no independent assessment of whether or how it was being applied to the management of the specific fishery in question. Although the

[89] For example the interpretation of the criteria (old version), 'the organization should incorporate a monitoring and research process' in one audit was that the Company did not carry out research (implying the Company being audited, rather than the management system of the fishery), and another said that an executive of the fisheries authority had accompanied the audit on the vessel to observe, monitor and advise. This does not address the issue of whether the management system of the fishery incorporates appropriate monitoring and research, and the management system in place for the fishery was not adequately assessed.

implementation of precautionary management is now better addressed in the updated criteria, this illustrates the importance of criteria being clearly defined, together with guidance for auditors on how to assess compliance with the criteria, and specific benchmarks for pass/fail. FOS indicated that they intend to develop a guidance document for auditors on how to assess against the various criteria (P.Bray, *pers. comm.*). This would hopefully address these issues.

Traceability

Traceability and chain of custody is included in the assessments, although the traceability audit reports are generally not publically available because of confidentiality. FOS also has on-site monitors to control chain of custody in certain fisheries and aquaculture operations (Philippines, India, Sri Lanka and Indonesia). They have also recently signed an agreement with the shipping firm Maersk to be able to track FOS shipments. The traceability procedure[90] aims to ensure full traceability, but relies on the skills of the certification bodies to interpret the procedure and apply appropriate checks to ensure chain of custody. To date, traceability audits have been undertaken by the current certification bodies (e.g. SGS, Bureau Veritas, IFQS) which have experience of conducting such traceability audits. However, with the acceptance of the Accreditation Procedure, the number of certification bodies may increase, and may include certification bodies with less experience than the current ones in conducting traceability audits for seafood products. As a result it may be necessary to provide greater detail of the checks and procedures required for FOS traceability and chain of custody of seafood products under the FOS scheme.

Developing countries, small-scale producers and data-deficient fisheries

Developing countries and small-scale producers are accommodated by the scheme, particularly because of its low cost for certification, making it more accessible to such fisheries and aquaculture operations. A number of fisheries in developing countries have been certified, including in Brazil, Indonesia, India, Azores, Sri Lanka, Maldives, Philippines, Papua New Guinea, Costa Rica, Senegal, Morocco, Madagascar, and Vietnam, demonstrating that the certification requirements and costs under Friend of the Sea are accessible to developing countries and small-scale fisheries.

Many small-scale fisheries in developing countries suffer from data-deficiency with regard to stock assessments, which may make certification difficult in some cases. FOS criteria do not allow data-deficient fisheries to be certified[91] and the same assessment procedure is used for small-scale fisheries as for larger-scale fisheries. FOS considers a data-deficient fishery to be one that does not have a state of exploitation indication for the species in the FAO area in which the fishery is conducted, or stock status information from the relevant RFMO or national marine research agency. If there is an indication of stock status for the species in question from the relevant FAO area, the fishery is not considered data-deficient.

Several Friend of the Sea certified fisheries, farms and processors have commented that they have chosen Friend of the Sea instead of other schemes because Friend of the Sea pricing is affordable, for example, the Indonesian shrimp trammel net fishery (Seacold), the Dutch gillnet fishery, the Philippine tuna handline fishery and a Tasmanian aquaculture producer.

Assessing compliance with the standard

Accreditation

As a third-party certification scheme, certification bodies must be accredited according to an agreed accreditation procedure. FOS has adopted an accreditation procedure that requires potential certification bodies to become accredited via their national accreditation bodies (rather than a single

[90] Available online at http://fos.bondwaresite.com/photos/Traceability_and_Chain_of_Custody_Procedure.doc

[91] Criterion 1.1 'The Fishery does not target stocks which are Overexploited, Depleted (Biomass below a truly precautionary level or fishing mortality above a truly prevautionary limit), Recovering or Data Deficient, according to the most recent stock assessment produced by one of the following: FAO, Regional Fishery Body, National Marine Research Authority.'

independent (private) accreditation body). The national accreditation authorities of different countries would accredit potential certifying bodies against the established accreditation procedure. This requires the accreditation procedure to be accepted by European Cooperation for Accreditation (EA). The Accreditation Procedure was submitted to them in 2007 for approval, but the process took a very long time, and only in mid-2009 was agreement reached on the Accreditation Procedure. EA works internationally with IAF – International Accreditation Forum so that non-European CBs will be able to be accredited under the FOS scheme. Under the new Accreditation Procedure, the certifying bodies would be checked or audited according to each national accreditation body's procedures.

In the interim, four certification bodies, which regularly carry out product and traceability certifications, including for fisheries and aquaculture, have been used to conduct audits for FOS. They are SGS, Bureau Veritas, IFQC and Aqa. The certification bodies used meet various standards (ISO 45 011 and ISO Guide 65 (EN 45011), are members of the International Accreditation Forum, or of their special recognition regional groups, and implement procedures described in ISO/IEC 17011:2004).

The current CBs will also have to go through the accreditation procedure. There are, therefore, further steps required for FOS accreditation and certification procedures to be fully compliant with the FAO guidelines, although these are being pursued and much progress has been made during the period of this review.

Certification
Audits of fisheries, aquaculture plants and chain of custody sites are carried out by the certification bodies, against the criteria established by FOS. The audit length depends on the complexity of the assessment (e.g. number of aquaculture plants, number of fishing vessels, number of processing sites to be audited for chain of custody). The indicative times established in the certification procedure are 0.5 days for document review, 0.15 days per fishing vessel to be audited, 0.5 days per aquaculture plant to be audited, and 0.5 days per site to be audited for chain of custody.

Recertification is carried out every three years for capture fisheries and aquaculture operations. A yearly surveillance of stock status for fisheries and for traceability is carried out.

Consultation and objections procedures
The objections procedure and opportunities for stakeholder input have recently (June 2009) been revised by FOS. The earliest point for stakeholder input to the certification process was the Objections Procedure (under the new Accreditation Procedure and Certification Procedure, this is now referred to as 'appeals'). This was available post-certification, but was modified in 2009 to provide a 15-day period for objections after the audit has been carried out and the report published on the website, before the certification decision is taken. Appeals must be addressed to FOS and the certification body, and will be examined by the certification body. A further change that was made was to add the opportunity for interested parties to register with FOS and provide comments (with evidence) for the certification audit, which must be taken into consideration by the certification body.

1.1.4. What are the results?

The scheme claims to identify fisheries that are sustainable and cause minimal impacts to the seabed. 26 fisheries have been approved and around 30 aquaculture operations. A significant number of these are in developing countries.

Environmental, economic and social benefits
Research has not been conducted into whether environmental benefits have resulted from certification. Certified fishery and aquaculture operations already meet the FOS environmental criteria, therefore they are not expected to show environmental improvements post-certification. Improvements may be realised pre-certification. For example, FOS indicated that some aquaculture producers improved their

practices in order to obtain FOS certification. For example, an aquaculture producer in Italy stopped using toxic antifouling paints in order to pass the FOS criteria, and an aquaculture plant in Vietnam introduced water quality monitoring as part of its corrective actions in meeting the criteria. Also, retailers that stock FOS products have committed to removing unsustainable or endangered species from their shelves (e.g. blue fin tuna from Coop Italia[92] and Manor Switzerland committed to stocking only sustainable seafood and seafood certified by Friend of the Sea by the end of 2008[93].

FOS does not make any specific claims of economic or social benefits (e.g. for producers, retailers) on the website. However, there is anecdotal information regarding social and economic benefits and the inclusion of minimum labour standards in the criteria should result in economic/social benefits to those employed. Economic benefits are not related to gaining a price premium but rather relate to accessing new markets, especially for small-scale producers who gain access to new retailers and markets they would otherwise not have access to. Some companies also report increased sales as a result of certification, e.g. Covedis / Sushi Zen in Switzerland reported a perceived increase in sales as a result of FOS-certified tuna, of around 20% over 12 months[94]. Economic benefits for producers can also be realised through increased demand for their product as a result of it being certified; the Indonesian shrimp trammel net fishery reported this to be the case[95].

1.1.5. Organisational costs and funding

A yearly fee is charged for licensed products, of €3,000 per product with the same origin. This fee is from €5,000 in the first year, which includes audit costs (generally around € 8,000). Audit costs are relatively low and are assessed based on the certification bodies quotation after receiving preliminary information from the client. No extra fees are charged for subsequent surveillance audits. Complex assessments (multiple sites etc) may imply higher fees. In general, 0.5 days is required per aquaculture plant, 0.15 days per fishing vessel, and 0.5 days per site for chain of custody. Audit fees are paid to FOS who then pay the certification bodies. In this way FOS aims to remove potential conflicts of interest that they believe may arise from the certification body being paid directly by the client fishery or aquaculture plant. However, it is not a transparent arrangement and FOS, as the standard-setting organisation, also becomes involved in the financial transactions of the certification process.

The cost of FOS certification is accessible to small-scale fisheries and aquaculture producers, and some chose the certification scheme over other because of its affordability. Several such companies confirmed that the cost was affordable e.g. Seacold with regard to the Indonesian shrimp trammel net fishery, Dutch gillnet fishery, Philippine tuna handline fishery, Tasmania aquaculture producer.

FOS's yearly budget is around € 600,000 and is funded from payments from logo royalties. Additionally, FOS received EU funding from the FOP Interreg programme and also from independent sponsors which support special events. Running costs of the organisation are kept as low as possible by minimising staff costs, in order to keep certification costs low.

[92] Fishupdate, 25 June 2007. Available at http://www.fishupdate.com/news/fullstory.php/aid/7896
[93] http://www.manor.ch/Fr/corporate/media.cfm?fuseaction=main&articleID=144&start=1
[94] Personal communication, Alexandre Striberni, Covedis, 29 May 2009.
[95] Personal communication, Ridwan Slamet, Seacold, 30 May 2009.

1.2. Marine Ecolabel Japan

1.2.1. Background

Marine EcoLabel-Japan (MEL-Japan) is a private sector organisation founded and supported by the Japan Fisheries Association (JFA) (DaiNiHonSuiSanKai), Japan's largest fisheries association/lobby (400 members; Vice Presidents include CEOs of Maruha, Nissui, Nichirei and Nichiro). MEL-Japan is established as a non-profit component of the Japan Fisheries Association.

MEL-Japan was established in December 2007 and the first fishery was certified in December 2008. It is not yet clear exactly where the product is being sold but it is almost certainly within Japan only. All current applicant fisheries are Japanese wild-caught fisheries (although one is freshwater). MEL-Japan stated they would consider fisheries outside of the Japanese EEZ on a case-by-case basis, however, they have not yet had any requests to consider such fisheries. It is noted that their materials (in English) state: 'In fishing communities in Japan, fishers have developed the concept of managing local fishery resources jointly and on their own will in order to ensure the subsistence of their communities. As a result, practical and effective resource management-oriented fisheries, incomparable in other parts of the world, have developed and expanded in Japan.' Given this it appears unlikely that MEL-Japan would certify any fisheries that are not Japanese-managed.

MEL-Japan characterises its main outreach activities thus far as being its website and pamphlets, however, they also periodically make presentations to the Japanese public and are written up in the press. The MEL-Japan website is in Japanese and English. The information content is much greater in the Japanese version and the English version does not match the Japanese version very closely.

MEL-Japan itself feels that the level of media attention to the scheme is more than sufficient for its promotional purposes (*pers. comm.,* MEL-Japan). However, the extent to which the public is aware of MEL-Japan is unknown and difficult to assess. MEL-Japan hopes to develop more materials for distributors, retailers and consumers, but believes that it will need to wait until more MEL-Japan-certified products are available so that the messages can be reinforced with products on store shelves. For the moment, MEL-Japan's main target audience is consumers but its materials are quite technical and dry and not particularly well targeted to the general public.

This may be because according to MEL-Japan materials and MEL-Japan's own statements, the key driver for the scheme is responding to fishermen's needs. The stated aim of MEL-Japan is 'to support fishermen who proactively undertake management activities for sustainable use of fisheries resources and protection of the ecosystem, and to encourage primarily consumers but also those connected with the fishery to proactively participate in sustainable use and ecosystem protection'. Other goals include: allowing for the continuation of Japanese food culture; using the power of consumers to encourage responsible fisheries; and recognising Japanese fisheries management (which they believe is fundamentally different from 'western' fisheries management). Regarding this last point, MEL-Japan stressed that involving fishermen in management (i.e. co-management) is particularly effective and efficient in fisheries such as those in Japan and MEL-Japan seeks to recognise fishermen who proactively participate in such schemes.

The scheme itself does not advocate on other issues. However, since the scheme is a component of JFA, which represents 400 member organisations of the fishing industry in Japan, MEL-Japan is peripherally connected to advocacy undertaken by JFA. JFA states its objective as being 'to promote the fishing industry and contribute to the economic well-being and cultural heritage of our country'.

1.2.2. What do they claim?

MEL-Japan is primarily, and currently, only concerned with wild caught fisheries, though they do cover both marine and freshwater species. There is currently one certified fishery: Japan Sea snow crab or benizuwai (*Chionoecetes japonicus*). Three other fisheries are undergoing assessment (one snow crab & flatfish; one krill and one freshwater clam). At present MEL-Japan is not concerned with aquaculture, however, MEL-Japan stated it may consider developing an aquaculture certification programme in the future.

While MEL-Japan states that its goal is to promote a healthy marine ecosystem, it does not make a specific claim with regard to environmental benefits. As no specific economic, social or organic standards are included in the scheme, there are also no claims of benefits in these areas.

The MEL-Japan scheme is based on compliance with the applicable laws and regulations of Japan. In particular, national laws and regulations relevant to fisheries control (permitting, control of effort/fishing areas/total catch quantity, gear regulations, prohibited species, and submission of logbooks) and waste discharges apply. International laws, regulations and agreements which are not explicitly accounted for in the national laws and regulations of Japan are not currently accounted for by the MEL-Japan standards, but may need to be incorporated in the future if fisheries outside of Japan's national waters apply for certification. If the fishery is not compliant with the relevant national laws, regulations and agreements, it will not be certified.

1.2.3. How do they do it?

MEL-Japan is a voluntary scheme primarily aimed at obtaining recognition from consumers, the press, and the fishing industry itself. MEL-Japan does not seek out fisheries to certify — the fisheries must come forward themselves. Its main outreach activities are its website and pamphlets, although it also participates in seafood conferences and symposiums.

MEL-Japan does not define sustainability as a stand-alone term. Instead, MEL-Japan believes that its certification standards, including the sub-criteria, embody sustainability. MEL-Japan standards are set in principle by the MEL-Japan Technical Committee. The basic MEL-Japan standards for production (fishery) certification are:

1. Fisheries should be conducted under an effective management scheme;
2. The target resource should be maintained at a level of sustainable use; and,
3. Appropriate measures should be taken for the conservation of the ecosystem.

These standards cover the main aspects defined in the FAO ecolabelling guidelines (the stock, the ecosystem and the management system).

The distribution (chain of custody) certification standards are:

1. A management system should be in place, such as the appointment of persons in charge and custody of related documents; and,
2. Traceability should be secured through Standard #1, etc., and the co-mingling of seafood other than the target seafood should not occur.

Specific guidelines to be used in each assessment are set by the certification body. The rules of procedure for standard setting are not published. The fishery is not measured against its own independently-developed and defined sustainability standards and heavy reliance is placed on government stock assessments without performing an independent review. In this sense MEL-Japan does not provide an independent review of the sustainability of the fishery *per se*; rather it is mainly a verification that management systems are in place.

MEL-Japan sets a standard and an accredited assessment body prepares a report describing the performance of the applicant fishery against the standard. At present there is only one assessment body (certification body), the Japan Marine Resources Protection Committee, which is accredited by the MEL-Japan Audit Committee itself. According to the flowchart published on the MEL-Japan website and to information provided by MEL-Japan in response to this study, the decision to certify a fishery is only made if two conditions are satisfied:

1. The accredited assessment body confirms through the assessment report that the fishery meets the criteria for certification; and
2. The MEL-Japan Audit Committee confirms the report of the accredited assessment body.

This structure poses two issues when considering whether the MEL-Japan scheme is compliant with the FAO Ecolabelling Guidelines. First, according to Section 69 of the Guidelines the accreditation body should be independent, impartial and transparent. Since under the current structure, the accreditation body is the MEL-Japan Audit Committee, there could be a reasonable doubt concerning whether the decisions of this Committee are wholly independent of MEL-Japan itself. Furthermore, while MEL-Japan asserts that the membership of the MEL-Japan Audit Committee consists of experts from the most authoritative institutions in Japan, unlike some of the other MEL-Japan committees, the membership of the MEL-Japan Audit Committee is not published on the MEL-Japan website (however MEL-Japan has offered to release the membership list upon request). At present, the role and function of the MEL-Japan Audit Committee in the accreditation process appears to some to lack transparency as well as independence. MEL-Japan has recognised this issue and stated that it will work to address it in the near future.

Second, according to Section 100 of the Guidelines, certification is a process whereby a third party gives written, or equivalent, assurance that a fishery conforms with the relevant standard. Section 24 of the Guidelines defines a third party as a 'person or body that is recognised as being independent of the parties involved, as concerns the issue in question'. MEL-Japan asserts that its certification system is a third-party system because the decision on whether or not to certify the fishery is made by the accredited assessment body and only confirmed by the MEL-Japan Audit Committee. MEL-Japan notes that the only way in which the MEL-Japan Audit Committee could influence whether or not a fishery becomes certified is if it rejects a positive assessment by the accredited assessment body and refuses to agree to the certification. In this sense, the MEL-Japan Audit Committee's influence on the certification process, if it chooses to exert one, would only be to deny certification and thus make the process of certification more conservative. While this argument has merit, it is likely that various interpretations of the 'independence' of this type of certification process are possible.

MEL-Japan's certification system, while potentially independent in practice, could be viewed as non-compliant with the FAO Ecolabelling Guidelines under an interpretation of the need for the decision to be taken by a party 'recognised as being independent of the parties involved'. Key considerations would be whether the certification body, as the sole certification body and accredited by MEL-Japan's Audit Committee, is really independent of MEL-Japan; and whether by confirming the certification body's report, the MEL-Japan Audit Committee is compromising the independence of that decision. At present, since its structure does not guarantee independence, MEL-Japan's compliance with the FAO Ecolabelling Guidelines could be challenged on a case-by-case basis depending on the degree of interaction between the accredited assessment body and the MEL-Japan Audit Committee on the certification decision.

Only one fishery has been certified at the time of this analysis. This is the Sea of Japan benizuwai (snow crab) which was certified in December 2008. The comment period for the publicly-released assessment report was from 18 July to 4 August 2008 (17 days). One set of comments on the report was received. These were published along with a four-page final summary of the certification decision. There is an objections procedure but it appears to cover only the case in which the applicant [fishery] wishes to

object to the results of the assessment. The benizuwai (snow crab) certification was not contested. The full text of the final report has not yet been released and MEL-Japan has stated that they do not intend to publish a revised full version of the report. Although the response to comments did not indicate any changes would be made to the report or the decision, MEL-Japan staff indicated that the content of the report had changed substantially between the draft (full) and final (summary) versions. It is not clear whether these changes were made in response to the public comments or for other reasons.

When the issue of assessing a sustainability outcome versus a process was discussed with MEL-Japan staff they pointed out that in the benizuwai fishery assessment Standard #2 states that 'the stock should be managed in a way that maintains a sustainable level of use'. While this is true, the assessment guidelines, which are translated as follows, do not define sustainable use and are primarily concerned with compliance:

- Guideline 5: The resource management system can be confirmed;
- Guideline 6: The resource management policy, the ABC calculations and other proposals for management policies beyond the ABC calculations can be confirmed;
- Guideline 7: If a TAC system is implemented, the summary points can be confirmed;
- Guideline 8: Other resource management measures:
    - Confirm that measures to change catch quantities in order to allow resource recovery are made with regard to fishing area, fishing vessels and other ways of parcelling out the measures;
    - The implementation situation with regard to closed fisheries, vessel reduction or improvement of fishing gear can be confirmed;
    - Effort level reductions and other related measures necessary to achieve these (as reinforced through permit limits and conditions) (if applicable), and related measures to ensure the stability of the fishing industry (if applicable), and other supportive measures (if applicable) can be confirmed;
    - Confirm that there is appropriate management to advance the resource recovery plans;
    - Confirm the details of independent actions (by fishermen) to advance the resource recovery plan;
    - Confirm the results of the resource recovery plan.

Only the last of these criteria pertains to results. In the full assessment report, this is addressed with a single sentence stating 'Awareness of the resource recovery plan among fishermen is being promoted, and a positive approach to the recovery policy is being taken'. The final summary report lists five points in support of 'resource management policy and results':

- From 2006–2008 the resource was at a low level but the trend changed from flat to upward.
- In recent years an increase in CPUE was achieved.
- The ABC calculation is conservative so even if the catch is above the ABC, we can see signs of recovery in the stock, a close watch is being kept on the situation, and selection of the appropriate management measures is being considered.
- Surveys of juvenile habitat are being conducted.
- Although the area is managed jointly with Korea, and although both countries are in the process of strengthening their management systems, the fishing areas are managed as discrete units to the appropriate level and thus can be managed independently by Japan.

While these statements go further than the assessment report in describing outcomes rather than just compliance, it is still difficult to determine what operative definition of sustainability is being used.

There has not been a specific assessment of the compliance of the one MEL-Japan certification body against the ISO Guide 65 requirements or other international standards of credibility, accountability and

transparency such as ISO, CAC and WTO principles. Compliance with the WTO agreement on Technical Barriers to Trade has also not been assessed. At present all certified and applicant products are expected to be traded within Japan. However, in future export-orientated products may enter the MEL-Japan system.

Audits of the certification bodies are carried out by the MEL-Japan Audit Committee which accredits the certification bodies. These are considered internal audits. The frequency and content of these audits are not specified. The certification bodies are required to audit the certificate holders (five year validity period for production certification; three year validity period for distribution certification — in line with the FAO guidelines) at least once per year. These are considered external audits. In the rare case of a large decrease in the level of the resource after certification, a new production certification may be required to be conducted.

In the only assessment published to date, some, but not all, sources of supporting information are referenced. There are no specific procedures for data deficient fisheries as this is not considered an issue in Japan. However, MEL-Japan staff asserted that data deficient fisheries could be handled under the existing system. Traditional knowledge and traditional management systems of fishermen are taken into account in the standard setting and certification assessment. Specific examples are not available due to the fact that only one fishery has been certified thus far.

1.2.4. What are the results?

The first fishery was certified in December 2008 and exact details of the sales points and prices of the products are not yet available. Therefore, it is too early to tell whether there will be a price premium associated with the certification.

MEL-Japan staff stated that they believe applicant and certified fisheries benefit from the positive publicity generated through the MEL-Japan website and media pick-up of these stories.

1.2.5. Organisational costs and funding

MEL-Japan levies fees directly for:

1. accrediting certification bodies (1,000,000 yen per year (US$ 10,100[96]));
2. membership registration for fisheries organisations which wish to help promote the scheme (50,000 yen per year (US$ 505)); and
3. providing copies of the certification (10,000 yen per copy (US$ 100)).

Fees for using the label are on a sliding scale from 30,000 to 100,000 yen per year (US$ 300–1,010) based a) the tonnage of vessels in the fishery (for 'production' certifications) or b) on the number of employees in the company acquiring the certification (for 'distribution and processing' certifications). MEL-Japan does not levy fees directly for its travel, meetings, printing, website, etc. costs. Certification fees are levied by the certification body.

MEL-Japan makes a point of offering low cost certifications. They state that 'MEL-Japan pursues a practicable framework in which diverse [fisheries] — large and small-scale alike — proactively engaged in sustainable fisheries can obtain certification at low [cost] by…requiring the recovery of actual costs only, avoid[ing] duplication of work, [and] utilizing to the maximum extent existing data acquired through the management efforts that have already been undertaken'. The certification costs for the one fishery that has achieved certification were 2,000,000 yen (US$ 20,000).

[96] Conversions use exchange rate at time of writing of US1 = 99 yen

MEL-Japan is funded by the Japan Fisheries Association and its individual member companies. The annual operating budget of MEL-Japan is 3,000,000 yen (US$ 30,000) of which 40% is provided by Japan's fishing industry, 33% from accreditation fees, 17% from registration fees from industry organisations, and 10% from other registration fees. MEL-Japan does not feel they need to consider alternative funding models as the cost of the organisation is low and thus in their view sustainable. They noted that if the scheme begins to cover products which are exported from Japan, translation costs will rise.

1.3. Marine Stewardship Council

1.3.1. Background

The Marine Stewardship Council (MSC) is an international, independent, non-profit organisation originally established in 1997 through an initiative of WWF and Unilever, but independent since 1999. It sets a standard for third party certification of fisheries and licences the MSC sustainability label for use on certified product. The organisation also sets a separate standard for chain of custody certification to ensure integrity of supply chains from certified fisheries to labelled products. MSC's primary focus is on ensuring the long-term viability of global fish populations and the health of the marine eco-systems on which they depend. The scheme is voluntary and market driven.

The MSC standard applies only to the labelling of marine and freshwater fisheries products from wild capture fisheries. The MSC's mission statement indicates an overarching goal of improving the health of the world's oceans through the promotion of the best environmental choice in seafood. The organisation recognises that their activities are only part of the contribution to this goal, however, the function of the organisation is wholly related to the implementation of the scheme and specifically the development and application of the certification standard. The stated mission of the organisation is: *To use our programme to contribute to the health of the world's oceans by recognising and rewarding sustainable fishing practices, influencing the choices people make when buying seafood, and working with our partners to transform the seafood market to a sustainable basis.*

The MSC standard can be applied worldwide. Approximately 55 fisheries, both demersal and pelagic, are currently certified. These are located around the globe, although the northern hemisphere (specifically USA and Europe) dominates. There is also a conspicuous gap in terms of developing countries, but the MSC is following several initiatives in an attempt to address this and both encourage and facilitate participation by developing country fisheries. The main markets where products are sold are in Germany, USA, UK, Netherlands and Japan.

The organisation has a significant in-house staff covering three main regions: (i) Europe, Middle East and Africa; (ii) Asia-Pacific; and (iii) Americas. There are two Communications Teams: 6 staff based in London (Europe, Middle East and Africa) and two in Seattle (Americas). There is also a focus on commercial outreach coordinated through the commercial team: 4 in London and 4 in the US.

1.3.2. What do they claim?

The intention is to re-assure consumers that if they see the MSC logo on a product, they can be confident that it has come from a fishery that has been certified as meeting the MSC standard for sustainability. However, this also applies to businesses along the supply chain, who may look to source MSC-certified fish whether or not they intend to use the logo on the final product.

The MSC standard applies only to wild capture fisheries. All species are eligible, although fisheries targeting introduced species cannot currently be certified. The MSC first announced in 2006, and reiterated in June 2008, the decision of its Board of Trustees to not expand the scope of the certification programme to include aquaculture, although certain defined types of enhanced fisheries may be eligible (MSC Policy Advisory 10). In essence, the scheme will cover enhanced fisheries providing the fish are linked to a wild stock and the process of enhancing does not include feeding. For example, a fishery that includes a stocking programme to enhance a wild fishery may be included, and a fishery that relies on the enhancement of habitat to increase the production of a wild stock may also be included. However, enhancement processes that include more invasive interventions such as substantial augmentation of food supply or disease prevention through the use of chemicals result in the fishery being outside the

scope of the MSC[97]. The MSC will not certify any fisheries that involve destructive or controversial fishing practices (use of poison, explosives or whaling).

The standard does not include economic and specific social criteria, however, the MSC's Integrated Strategic Plan (Feb 2007) states: "We aim to contribute to reversing the decline in global fish stocks, to deliver quantifiable improvements in marine conservation, and thereby, contribute to securing the livelihoods that depend on this industry. We will achieve this by harnessing market forces to drive changes in fishing practices." This language indicates an overarching aim to contribute to social improvement for those dependent on the fishing industry and the MSC actively engages in commercial outreach to promote awareness within the business community (including retailers) of the importance of sustainability and to encourage the use of market forces to change attitudes.

Currently MSC does not recognise equivalence with any other ecolabelling scheme, although the MSC has said that it will recognise other certification schemes if it can be demonstrated that the standards and institutional arrangements for those schemes meet the MSC standard. There are few other labelling schemes applying to capture fisheries that could be assessed for compliance with the MSC.

1.3.3. How do they do it?

Standard setting

The standard was originally developed through a 'process expert consultation' conducted around the world between 1997 and 1999. The MSC Standard Setting Procedure specifies the requirements and procedures to be followed by MSC for the development, review, modification and approval of MSC standards. These procedures are designed to comply with the ISEAL Code of Good Practice for Setting Social and Environmental Standards (2006). Proposals to develop a new MSC international standard may originate from the MSC Board of Trustees (Board), Technical Advisory Board (TAB), Stakeholder Council (StC) or MSC staff members (MSC Executive). Section 1.7 and section 1.8 of the Standard Setting Procedure require the set up of a Stakeholder Forum (SF) and an Interested Party Advisory Committee (IPAC) to ensure participation by technical experts and interested parties.

Procedures to ensure participation and transparency are outlined in the document *MSC Standard Setting Procedure: The Development and Approval of MSC International Standards (2007) Version 1.0*[98], which was approved by MSC's Technical Advisory Board in May 2007. These procedures are also designed to comply with the ISEAL Code of Good Practice, and thereby to demonstrate compliance with the applicable requirements of ISO/IEC Guide 59 Code of good practice for standardization, and the WTO Technical Barriers to Trade (TBT) Agreement Annex 3 Code of good practice for the preparation, adoption and application of standards.

Credibility of the standard is ensured through the expert input of MSC's Technical Advisory Board and other independent experts engaged from time to time, for example during the MSC's Quality and Consistency Project.

The standard

In this section the main features of the MSC standard are described and compared against the minimum substantive requirements set out in the FAO ecolabelling guidelines.

There is no specific definition of sustainability provided by the organisation; instead the degree to which a fishery is deemed to be "sustainable" is implicit in the certification standard. The standard itself therefore sets out what the MSC regards as defining sustainability for a fishery. If a fishery is certified then it is regarded as sustainable, by definition. The standard itself has three principles: target stock

[97] http://www.msc.org/get-certified/fisheries/eligible-fisheries

[98] available here: http://www.msc.org/documents/msc-standards/MSC-Standard-Setting-Procedure-May2007.pdf/view

health (Principle 1); ecosystem health and impacts from the fishery (Principle 2); and management system (Principle 3). Environmental criteria include bycatch and ecosystem factors, but not such issues as food miles, nor organic production.

The specific details of three principles are described in more detail below. Under each principle there is a set of more detailed criteria that must be satisfied. Until recently, the setting performance indicators to meet each criterion was a task conducted separately for each fishery by the Certifying Body. In July 2008 for the first time, MSC produced a generic set of performance indicators for use on all fishery assessments, thereby significantly increasing the consistency of the standard between certifications.

Each performance indicator is scored on a scale from 60 to 100 and scoring guidelines are provided at the 60, 80 and 100 levels. The nominal "pass mark" is the 80 level. Intermediate scores are possible if a fishery meets some, but not all of the guidelines at a particular level. Generally the precision of the scoring is not more than 5 (i.e. a score of 75, 80 or 85 may be given, but a very clear justification would need to be provided for scoring in between). If an individual performance indicator scores below 60 then the fishery as a whole automatically fails. Any performance indicators that score below 80, but above 60, have a condition associated, that the fishery must achieve within a set timeframe agreed at the time of certification. Also the average score for each of the three principles must be above 80 for the fishery to pass.

The fish stock under consideration (Principle 1)

Principle 1 of the MSC's Fishery Certification Standard requires that a fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery. More specifically, the fishery shall be conducted at catch levels that continually maintain the high productivity of the target population and associated ecological community relative to its potential productivity. The assessment of Principle 1 is divided into outcome indicators (stock status, reference points and stock rebuilding) and harvest strategy indicators (e.g. the harvest strategy, control rules, monitoring and stock assessment procedures).

To achieve unconditional certification, the stock size should be highly likely to be above the point where recruitment would be impaired, and should be at or fluctuating around its target reference point[99]. Reference points should be appropriate for the stock and capable of being estimated. The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome[100]. These requirements are detailed and verification necessitates a detailed review of the most up-to-date stock assessment information and indicators.

When a stock is depleted (defined in the Fisheries Assessment Methodology (FAM) glossary as one that is consistently below the target reference point, and which may be approaching the point at which recruitment is impaired) a rebuilding plan must be in place and fishing mortality must be at a level consistent with restoring the stock to its target reference point within an appropriate timescale. There must also be evidence that the stock is rebuilding, or that it is highly likely that the strategy adopted will meet the rebuilding target. If, however, a depleted stock is subject to overfishing (i.e. fishing mortality is too high and the stock is not rebuilding) then it would fail certification[101].

Article 30 of the FAO guidelines requires that overfished stocks are not certified as sustainable. The term 'overfished' does not appear in the FAM, however, it is generally regarded to mean the stock

[99] Principle (P)1, Performance Indicator (PI)1.1.1, Scoring Guideline (SG) 80.
[100] P1 PI 1.1.2 SG80.
[101] under PI 1.1.3 SG60.

biomass is at a level where the future viability of the stock is threatened. The MSC standard[102] requires the limit reference point to be set above the level at which there is an appreciable risk of impairing reproductive capacity (i.e. the future viability of the stock is threatened). A stock that is below its limit reference point would therefore be regarded as overfished. According to the FAM, stocks below the point at which recruitment is impaired would fail MSC certification.

Ecosystem impacts (Principle 2)

Principle 2 in the MSC's standard states that fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends. There are requirements for management responses and/or research that demonstrably address the impacts that are likely to have the most serious consequences for the target stock and the ecosystem on which it depends. The assessment of impacts includes outcome, management strategy and information indicators for retained, bycatch and endangered, threatened and protected species, and habitats and ecosystems. By focusing on the 'ecosystem on which the fishery depends', this covers the impacts of the catching operation and the landing or first transhipment of the catch from the fishing vessel. It is therefore constrained to the ecosystem in which the target stock's lifecycle is concluded. This covers most of the impacts that a fishery is likely to have, however, if, for example, processing of the catch away from the area of the fishery (e.g. on land) were to result in adverse impacts in a separate ecosystem, this would not be assessed under an MSC certification and would have no effect on the result.

Management System (Principle 3)

Principle 3 of the MSC's Fishery Certification Standard requires that the fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable. This principle specifically addresses the structure and function of the management system in place. The intent is to ensure that there is an institutional and operational framework, appropriate to the size and scale of the fishery, for implementing Principles 1 (covering the sustainability of the target stock) and 2 (covering bycatch and ecosystem impacts) that is capable of delivering sustainable fisheries in accordance with the outcomes articulated by Principles 1 and 2. There are two main threads under Principle 3: 'Governance and Policy' captures the broad, high-level context of the fishery management system within which the fishery under assessment is found; and 'Fishery Specific Management System' focuses on the management system directly applied to the fishery undergoing assessment.

Decision-making under the management system must be based on the best available information[103]. Under Principle 1, the Performance Indicator covering information and monitoring requires the availability of sufficient relevant information related to stock structure, stock productivity, fleet composition and other data to support the harvest strategy[104]. Principle 3 also requires a research plan in place that provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.

Decision-making processes must be established that result in measures and strategies to achieve the fishery-specific objectives[105]. Short- and long-term objectives that are explicit within the fishery's management system must be consistent with achieving the outcomes expressed by MSC's Principles 1 and 2[106] (i.e. that the fishery is conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, in a manner that demonstrably leads to their recovery).

[102] PI 1.1.2.
[103] P3, PI 3.2.2, SG80.
[104] P1, PI 1.2.3 SG80.
[105] Principle 3, Performance Indicator 3.2.2 SG80
[106] Principle 3, Performance Indicator 3.2.1 SG80

Principle 3 requires a monitoring, control and surveillance system that has demonstrated an ability to enforce relevant management measures, strategies and/or rules. It must include sanctions to deal with non-compliance that are consistently applied and thought to provide effective deterrence[107].

Principle 3 requires that decision-making processes use the precautionary approach and are based on best available information[108]. The guidance notes provided for CBs further elaborate that this means that decision-making processes themselves use caution when information is uncertain, unreliable or inadequate, and that the absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures (derived from Article 6 of the UN Fish Stocks Agreement).

Traceability

The MSC operates a separate Chain of Custody certification procedure that aims to ensure that fish from certified fisheries are kept separate from other fish throughout the supply chain from the point of capture to the final point of sale or packing. Chain of Custody certification is a prerequisite to using the MSC ecolabel. Each business in the chain of custody is assessed against the MSC standard for systems and procedures required to ensure that MSC-certified fish are kept separate from other fish. They must have effective storage and record-keeping systems which prove that only seafood from a certified fishery carries the MSC ecolabel. When a certified business receives MSC-certified fish, it must ensure that they come from a supplier that is similarly certified. Production lines must then implement either spatial or temporal separation to ensure that non-certified fish do not become co-mingled with MSC-certified fish. Where flavourings or additive ingredients are used in final products there is a limit of 2% by weight that can come from non-certified sources. MSC Chain of Custody certification is valid for 3 years. On-going auditing is carried out to check on continuing compliance. After 3 years the business must be reassessed if it wishes to remain in the MSC programme.

Developing countries, small-scale producers and data-deficient fisheries

Very few developing country fisheries so far have been certified by MSC. However, MSC has a specific programme dedicated to meeting the special needs of developing world fisheries, focussing on small-scale and data deficient fisheries. Two staff in the London office and one in South Africa are allocated to this programme full time. Key issues being addressed are approaches to certifying data deficiency, the cost of certification and the management context in countries where governance structures are less well developed.

MSC's procedures for certification of small-scale and/or data-deficient fisheries are set out in detail in the RBF and Guidance to Certification Bodies Version 1, released for public consultation in February 2009. MSC's risk-based methods are derived from the Ecological Risk Assessment Evaluation Framework (ERAEF) methodology which has been developed by CSIRO Marine and Atmospheric Research with co-funding from the Australian Fisheries Management Authority. The RBF is designed for use in association with the Assessment Tree provided as part of the MSC FAM. The RBF includes a set of methods for assessing the risk to each impacted ecological component (covering the target species, retained catch, bycatch, habitats, and ecosystems) from activities associated with the fishery under assessment. The methods range in complexity and data requirements from a system based on expert judgment and stakeholder consultation (Scale Intensity Consequence Analysis - SICA), to a semi-quantitative analysis to assess potential risk (Productivity Susceptibility Analysis - PSA). This methodology is currently available for CBs to use but has not yet been used to complete a full assessment under the MSC scheme.

[107] Principle 3 Performance Indicator 3.2.3 SG80
[108] Principle 3, Performance Indicator 3.2.2, SG80

Six developing country fisheries are currently under assessment using the RBF: The National Park of Banc d'Arguin mullet fishery, Mauritania; the mahi mahi fishery, Ecuador and Peru; the coastal and River Gambia sole fishery, Gambia; India oil sardine, Pallithottam-Thankassery, Kerala India; the Samborombon Bay mullet fishery, Argentina; and the Vietnam Ben Tre clam fishery. None of these fisheries has yet reached full assessment.

Assessing compliance with the standard

Accreditation

Fisheries are certified by independent, accredited third party certification bodies (CBs). Accreditation of CBs is undertaken by a private independent company Accreditation Services International GmbH (ASI) under a contract with the MSC. ASI is a limited liability company (GmbH) registered under German law. The sole shareholder of ASI is the Forest Stewardship Council (FSC), registered as an Association Civil in Mexico. ASI is responsible for CB assessments and makes all accreditation decisions independently of the MSC; ASI has an accreditation committee made up of four independent experts that review and approve ASI decisions. ASI has developed a Quality Management System to be compliant with ISO 17011 (Conformity assessment — General requirements for accreditation bodies accrediting conformity assessment bodies[109]). MSC requires ASI to evaluate all MSC CBs against MSC requirements (the Accreditation Manual), which requires CBs to comply with ISO Guide 65, methodologies, directives etc. and accredit them. MSC has no authority over ASI accreditation decisions and ASI has no responsibility for the content of MSC scheme documents (but is responsible for their distribution to CBs).

Previously, accreditation was undertaken internally within the MSC by their Accreditation Manager. The function separated from MSC in 2006 and was transferred to ASI under contract. Initially a one year pilot contract was agreed. Following successful completion of the first year, a longer term contract was agreed in 2008. The MSC's former Accreditation Manager was engaged by ASI as an independent contractor, and remains in charge of the accreditation process.

Separate accreditation procedures exist for certifying bodies wishing to conduct fishery certifications, and those wishing to conduct chain of custody certifications.

Certification

CBs use assessment teams of three experts to assess the fishery against the MSC standard (one expert for each Principle) who spend on average 20 days each per assessment. Often another person from the CB is involved in overall supervision. The assessment team deployed by a CB sources all of the information for the assessment directly from the fishery managers, stock assessment scientists, policy makers and other stakeholders. Information is not taken from other ecolabelling schemes or secondary sources. They must post information on the MSC website, including assessment procedures, performance indicators, draft reports, final reports, objections and resolutions (if any), and the final certification decision, including any conditions that the fishery must fulfil to maintain certification.

The identification and use of the best scientific evidence available in assessing compliance with the standard is the responsibility of the CBs. The Assessment Tree[110] and the fishery certification methodology (FCM) require CBs to source all relevant information to assess compliance with the standard and to identify clearly where information is lacking. The CBs' findings and the sources of information used are presented in the public assessment report posted on the MSC web site.

CBs' reports are subject to peer and stakeholder review and if scientific evidence has been omitted, it would be identified at that stage. The objections procedure may be invoked if necessary to compel CBs

[109] Accreditation = third-party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks — ASI is the third party.

[110] The detailed performance indicators under each Principle in the Standard.

to use the best information available. This assumes, however, that there is sufficient engagement from the stakeholder community to provide adequate scrutiny of the information that has been used.

Traditional knowledge would be taken into account in the absence of scientific information within the MSC's newly approved Risk Based Framework (RBF), a component of the Fisheries Assessment Methodology (FAM) to provide for assessments of data-deficient fisheries. The RBF includes detailed procedures for consultation with stakeholders to assess the risk posed by fishing to the target species and the ecosystem in which it occurs, where scientific data on stock status and ecosystem impacts are lacking. This is discussed further in relation to the special needs of developing country fisheries.

Reports of the CBs on specific fisheries that are currently certified or are going through the certification process are posted on the MSC's website. Reports provide details (references) of all sources of information used in the assessment. A fishery certification lasts for five years. After this time a complete re-assessment is required. Any changes to the fishery assessment methodology in the intervening period would be applied at that time.

Consultation and objections procedures

There are opportunities for consultation throughout the standard-setting and certification processes. MSC's membership of ISEAL requires an acceptable level of involvement of stakeholders, the quality of stakeholder representation, and reasonably balanced views of stakeholders in the standardisation process and governance. There was extensive consultation on the development of the original standard. The procedures for review of the standard also require extensive consultation (see above).

All fishery assessments are subject to peer review and there is a formal procedure for objections to the findings of the CBs. This procedure includes constraints on time and the grounds for the objection and also a fee to protect the CBs from spurious challenges. Collectively this means that interested parties should make sure they become involved in the consultations on the certification at an early stage in the process and remain involved throughout the process. Some regard this as a weakness in the system from the perspective of stakeholders, but there is a high level of opportunity for consultation afforded to those who are interested.

The objection procedure establishes an Independent Adjudicator (independent of the MSC Executive) appointed by the MSC Board for considering objections to fishery certifications. Paragraph 5.6.10 The Independent Adjudicator must excuse themselves from considering the objection if there is a conflict of interest. Paragraphs 5.6.7 – 5.6.8 The Independent Adjudicator may solicit external advice from experts that must similarly be free of a conflict of interest.

Consultation during the MSC's Quality and Consistency project resulted in the development of a new generic set of performance indicators for undertaking assessments against the original Principles and Criteria. In relation to the Objections procedure, there is also evidence of a specific and detailed response to objections. The MSC convenes an independent objections panel to assess the grounds of the objection and reach a determination with respect to its outcome. Objections to MSC certifications have been brought on the basis of the accuracy of the information used and/or presented by the CBs. For example, the original decision to certify the BSAI Pollock fishery in 2004 was objected to on two grounds: firstly that the pollock stock was below B_{MSY}, contrary to the finding of the CB, and secondly that the conditions specified to address the risk to the Steller sea lion population did not go far enough in terms of precautionary action. The fishery was finally certified in 2005, following conclusion of the objection procedure.

Conduct of audits

Standard-setting body: MSC has recently undertaken an internal audit of its standards and processes relative to the FAO guidelines. An external audit on FAO compliance has not been undertaken, but it is

pending. MSC is a full member of the ISEAL Alliance[111]. ISEAL provides Codes of Good Practice that are international reference documents for credible social and environmental standards. Compliance with these codes of good practice is a membership condition.

Accreditation Body: No internal or external audits have been undertaken of ASI procedures; according to information from ASI, an internal audit will be carried out in mid-2009 and an external audit will be undertaken towards the end of 2009.

Certification bodies: ASI conducts an assessment of each CB every 5 years and monitoring audits on an ongoing basis.

Certificate holders: Audits of certified fisheries are carried out every year to check on progress against any Conditions of Certification that must be complied with for the fishery to maintain its certified status. The audit results are recorded in "surveillance reports" which are posted on the MSC website. These reports contain information on the extent of compliance relative to each condition. If non-compliance is noted the fishery will usually be given a chance to rectify the situation within a strict timeframe. For example, in 2007, the Hastings Fleet Dover Sole Trammel Net Fishery was found by the CB to be behind schedule with a condition requiring action to mitigate problems with misreporting in the offshore fishery and under-reporting in the inshore fisheries. Immediate action was taken by the client fishery and full conformance with the condition was confirmed through an expedited follow-up audit. If a non-conformance is judged to be continuing, this can result in suspension or withdrawal of the certificate by the CB.

Communication
The primary role and intent of the organisation is communicated to the public principally through the MSC website[112], although there is also an outreach programme that is increasing MSC's consumer outreach. There is extensive information on the website about what the MSC does and what it is seeking to achieve in terms of sustainable fisheries. The presentation is detailed, presenting the complex issues in assessing the sustainability of individual fisheries. The MSC is seeking to communicate not just with consumers but also NGOs, commercial interests (to generate interest in certification) and also certification bodies who put the certification standard into practice.

The difficulty for MSC is in communicating what the logo itself means. Added wording on the packaging reads "This product comes from a fishery which has been certified to the Marine Stewardship Council's environmental standard for a well-managed and sustainable fishery www.msc.org". If consumers do not visit the web site then the presence of the logo and the supplementary language may not be sufficiently informative for average consumers. For this reason, MSC have recently launched a new logo, which includes the wording 'Certified sustainable seafood', to clarify the message that the logo embodies[113].

1.3.4. What are the results?

At present there are no specific indicators established by which MSC routinely evaluates performance against its objectives, although there is an on-going collection of "anecdotes" from the fishing industry regarding environmental and economic benefits.

Environmental, economic and social benefits
No specific environmental benefits are claimed, but there is a clear expectation expressed in the MSC literature that their approach to certifying fisheries and labelling products from those fisheries will

[111] http://www.isealalliance.org/index.cfm?nodeid=1
[112] http://www.msc.org (see for example http://www.msc.org/about-us)
[113] Improving value to partners through marketing; Introducing an evolved MSC ecolabel. 15 July 2009. http://www.msc.org/business-support/new-msc-ecolabel.

result in a positive contribution to the health of the world's oceans. In 2005 MSC initiated a project to develop a long term strategic framework for monitoring and evaluating the environmental benefits arising from their certification programme. The first phase of this project is complete and included a cataloguing and assessment of current evidence that the MSC eco-labelling programme results in positive outcomes (benefits) for the environment. The principle vehicle through which an environmental gain would be realised is the setting of conditions on fisheries that need to demonstrate some changes and improvements in order to maintain certified status. The study concluded that all certified fisheries have shown some environmental gain resulting from the certification process and while some environmental gain has arisen in areas for which there were no specific conditions set, in general the biggest gains have been in areas which carried conditions for maintaining certification.

With respect to economic benefits, the MSC web site lists the following potential advantages to fisheries that become certified to the MSC standard[114]: Secure contracts, access to new markets, potential price premiums, good reputation, improved relationships, economic stability andconfidence in the future. In other parts of the MSC literature (e.g. the Integrated Strategic Plan, February 2007), the link is made between reversing the decline in global fish stocks and improved livelihoods for those that depend on the fishing industry. The MSC web site also claims that fishery certification provides a "*a competitive edge in the marketplace*". Under the heading of "Reaping the Benefits" the site further states "*Retailers and consumers throughout the world want MSC-labelled seafood products. As the MSC label has become more widely recognised the demand for certified product has grown. Gaining certification can open new doors for your product*."

At present there is no routine appearance of a price premium for certified products relative to similar products from uncertified fisheries. This is likely to be at least partly because it is very difficult to show direct comparisons. MSC has reported a few indications of higher prices, but given the number of certified fisheries is now in the region of 100, and the certification programme has been running for over 10 years, one might have expected to see more, if this were to be a reasonable and routine expectation.

In March 2000, the MSC reported that following the certification of the Thames herring fishery in the UK, there was a significant increase in the level of interest from the retail sector creating a premium for the herring. The MSC web site reports anecdotal evidence from fishers that that prices paid to the herring fishermen increased by up to 50% (http://www.msc.org/newsroom/msc-news/archive-2000/first-proof-of-msc-label-benefits-to-uk-fishing). According to the MSC, the price of certified Patagonian scallop has also been higher than uncertified product.

By contrast, improved market access is reasonably expected to be a direct benefit with some retailers making commitments to source exclusively MSC certified products. Both ASDA and parent company Wal-Mart have made a pledge to move towards sourcing all their fish from MSC certified fisheries within the next few years. In late 2007, the entire Dutch retail sector pledged that from 2011, 100% of the wild-caught fish and seafood will come from MSC certified fisheries. There are also cases of access to premium markets that would not have otherwise arisen. For example, in 1999, Whole Foods Market (the world's largest retailer of natural and organic foods with more than 270 stores in North America and the United Kingdom) discontinued the sale of Chilean sea bass (Patagonian toothfish) in all of its stores due to concerns about illegal fishing and the resultant overfishing of many stocks. In September 2006, the company announced it would resume selling the fish, but only from the newly MSC certified fishery at South Georgia in the South Atlantic.

To date, only one fishery has failed a full assessment. This is mainly because those that would be expected to fail do not usually progress beyond the pre-certification stage until they have addressed, or started to address, the issues that would result in a failure. In July 2007 the North East Sea Fisheries

[114] http://www.msc.org/business-support/the-value-of-msc-certification

Committee (NESFC) Lobster Fishery off the east coast of England failed. This was not because the stock was considered to be overfished, but instead because there was insufficient analysis of the available data to provide an assessment of stock status. The confidentiality agreement built into the pre-certification stage does not allow for any assessment to be made about the number of fisheries who have made the decision to either not proceed to the next stage or those who would not pass a full certification process.

One of the most controversial fishery certifications to the MSC standard has been that of the US Alaska pollock fishery, which was first certified in February 2005 following a lengthy assessment and objections process. Environmental groups, including Greenpeace, assert that the fishery should not be certified on the grounds of poor stock status. In late 2008 MSC responded that the fishery remains certified despite a drop in biomass because the management authority was taking appropriate action to reduce the allowable catch. This fishery is currently going through the assessment process for re-certification.

Brand recognition
Both brand confusion and logo recognition are currently being addressed by MSC as priority issues. MSC admits that consumer outreach has not been as well addressed as other parts of their outreach programme. To date they have been more focussed on commercial outreach further down the supply chain. There is concern, for example, that the logo itself does not convey a clear message to customers in terms of what it means with respect to the characteristics of the source fisheries and their sustainable management. There is also a problem with "leakage". This refers to the case where fishery products from MSC certified fisheries are not labelled as such at the point of sale/consumption. While recognising that the use of the label is not the sole reason for a fishery seeking certification, MSC has noted that the degree of leakage is high - preliminary estimates from February 2007 were 85% in the UK and 60% in Germany. There is a significant cost associated with labelling, above and beyond that of fishery certification. For a product to carry the label it must have full chain of custody certification and pay for logo licensing. MSC is understandably keen to reduce the level of leakage (its target is in the region of 50%) and firmly establish the brand recognition.

MSC has been conducting research into brand recognition that included questions about fisheries vs. aquaculture products. The results of this survey were not available at the time of writing. One of the few products that appear routinely on supermarket shelves in both wild caught and aquaculture forms is salmon. In early 2004, the MSC reported that the certification of wild caught Alaska salmon was proving helpful to consumers to identify certified wild fish. It is not clear, however, the extent to which consumers understand clearly that farmed salmon cannot carry the MSC label, and why this is the case.

1.3.5. Organisational costs and funding

There are costs associated with assessment by the CB, both for fishery assessment and chain of custody. These are negotiated directly between the client fishery and the CB without the involvement of MSC.

The cost of certification results from a combination of the complexity of the certification standard, the scope and nature of the fishery undergoing assessment and the cost structures of the CB. The MSC has control over the first of these but not over the other two. Cost structures are not generally published, because the CBs are in competition with each other. It is up to the client fishery to seek quotes from a number of CBs and select amongst these. CBs should not collaborate in this process to make sure it is truly competitive. The cost of certification to the MSC standard is widely recognised as significant, and can represent an obstacle to certification of small scale fisheries. The certification process is complex and can take more than a year to complete. Efforts have been made to streamline this, and hence reduce costs to some extent. For example, the MSC's recent project on quality and consistency has resulted in the preparation of a generic set of performance indicators for use in all fishery assessments. In addition to improving consistency, this new "assessment tree" should reduce the time needed for CBs to undertake their work, and therefore reduce costs. There is also competition between the increasing

number of certification bodies that has the effect of driving prices down to some extent. The MSC web site also lists three possible avenues by which candidate fisheries could apply for funding assistance: UK Department for Environment Food and Rural Affairs (Defra) through the European Fisheries Fund (fisheries in England only); Sea Change Investment Fund, which is supported by the Packard Foundation and provides grants to companies that increase the availability of sustainable seafood in the marketplace; and the Sustainable Fisheries Fund (SFF), administered by the Resources Legacy Fund, with grants open to fisheries and seafood organisations, fisheries management organisations, academic and research organisations and non-governmental organisations.

Separate to the feed paid for certification and chain of custody assessments, there are licensing fees for the use of the logo which are set and charged by the MSC directly. These are different for consumer-facing and non consumer-facing (see table below). Examples of the former include retail and independent brand MSC-labelled seafood products, menus in foodservice outlets and 'direct to consumer' websites; examples of the latter include bulk packaging, foodservice caterer price lists and websites. There is a schedule of the use of logo fees on the MSC web site (http://www.msc.org/get-certified/use-the-msc-label).

MSC charges for logo use:

Tiered Fee Schedule for MSC logo use		
Sales of MSC-labelled products	Consumer facing (Annual Fee + Volume)	Non-consumer facing
0 USD – 200 000 USD	250 USD + 0.5% of sales	250 USD
200 001 – 500 000 USD	1000 USD + 0.5% of sales	1000 USD
> 500 000 USD	2000 USD + 0.5% of sales	2000 USD

The CBs also incur costs in becoming accredited to undertake certifications. The fees for accreditation are set by ASI and are the same for every CB. Added to this is the cost to the organisation seeking accreditation to develop and maintain the expertise and systems necessary to meet the rigorous requirements of accreditation. Again, this does represent an obstacle to organisations that are considering becoming accredited. There has been a long running concern, particularly among client fisheries, that there are not enough accredited CBs to handle the growing demand for certifications (see, for example, the chapter in Ward and Phillips (2008) by John Gilmore on the certification of the Alaska pollock fishery (page 276)). One might reasonably expect that this growth in demand would result in a large number of companies seeking accredited status, however, the financial commitment needed to become accredited still deters many organisations from pursuing accreditation. The aim of the MSC to make the certification standard more accessible to fisheries in developing countries also suggests a need for CB based in those regions. Financial constraints are likely to be even more acute in this case, and the MSC has indicated that the SFF is exploring whether funding could be allocated to accreditations as well as certifications to assist in this regard.

Current funding for the MSC from logo licensing revenues is around 38% (2008-2009)[115]. In the period 1 April 2007 to 31 March 2008 (the most recent on the MSC web site) this was only 12%. The remainder of the income is made up of donations of various kinds. Two of the largest donors are the Walton Foundation[116] and the David and Lucille Packard Foundation[117].

From 1 April 2007 to 31 March 2008 the total income was £4.15 million and total expenditure was £3.4 million. This is expected to have risen to approximately £5million in the period 08/09 and is projected to rise further to approximately £7 million for 09/10. The MSC maintains approximately a six month operating reserve.

[115] Pers.comm., MSC
[116] http://www.waltonfamilyfoundation.org/
[117] MSC Annual Report 2008

1.4. Global Aquaculture Alliance

1.4.1. Background

The Global Aquaculture Alliance (GAA) is an international, non-profit trade association, registered in the USA, that promotes advancement in environmentally and socially responsible aquaculture. The GAA has developed Best Aquaculture Practices (BAP) certification standards for aquaculture products.

GAA's main functions are to:

- Provide information about the aquaculture industry to consumers, government agencies and the media;
- Advocate for the industry in international forums;
- Assist its members in advocacy to national governments;
- Organise and support technological research;
- Provide technical and other information to its members;
- Develop standards of good practice or codes of conduct for the aquaculture industry;
- License organisations (the Aquaculture Certification Council, or ACC) to certify according to GAA standards or codes; and
- Develop and authorise use of marks or logos designating adherence to codes or standards.

The GAA promote aquaculture species as being healthy and environmentally friendly, by reducing the pressure on wild capture fisheries. They promote aquaculture as being socially responsible by articulating the importance of aquaculture as a source of food and employment and its compatibility with community needs and environmental protection. They also have a code of practice for community and employee relations in relation to shrimp farming. The purpose of the Code is to foster good relationships among shrimp farm officials, workers, and local communities and is separate from the BAP certification standards.

1.4.2. What do they claim?

The GAA is concerned with shrimp and fish of aquaculture production. They cover shrimp farms, catfish, tilapia, hatcheries, processing plans and repacking plants. They are not involved with capture fisheries. The ACC certifies aquaculture facilities including seafood processing plants, hatcheries and growout enterprises. Products covered under the GAA scheme may be organic but organic certification is not a goal of the GAA.

Products meeting the GAA BAP standards assure the customer that the product has been produced with minimal environmental impact. For example, criteria used to assess tilapia culture include:

- Property rights and regulatory compliance: farms shall comply with local and national laws and environmental regulations, and provide current documentation that demonstrates legal rights for land use, water use, construction, operation and waste disposal;
- Community relations: farms shall strive for good community relations and not block access to public areas, common land, fishing grounds or other traditional natural resources used by local communities;
- Worker safety and employee relations: farms shall comply with local and national labour laws to assure adequate worker safety, compensation and, where applicable, on-site living conditions;
- Wetland conservation and biodiversity protection: aquaculture facilities shall not be located in mangrove or other sensitive wetland areas where they displace important natural habitats. Farm operations shall not damage wetlands or reduce the biodiversity of other ecosystems. Wetland area removed for allowable purposes shall be mitigated;
- Effluent management: farms shall monitor their effluents to confirm compliance with BAP effluent water quality criteria. In lakes, reservoirs and estuaries, operations shall comply with feeding rate limits;

- Fishmeal and fish oil conservation: farms shall accurately monitor feed inputs and minimise the use of fishmeal and fish oil derived from wild fisheries;
- Soil and water conservation: farm construction and operations shall not cause soil and water salinisation or deplete groundwater in surrounding areas. Farms shall properly manage and dispose of sediment from ponds, canals and settling basins;
- Control and escapes, use of GMOs: certified farms shall take measures to minimise escapes of farm stock and comply with governmental regulations regarding the use of native and non-native species, and genetically modified organisms;
- Storage and disposal of farm supplies: fuel, lubricants and agricultural chemicals shall be stored and disposed of in a safe and responsible manner. Paper and plastic refuse shall be disposed of in a sanitary and responsible way;
- Animal welfare: producers shall demonstrate that all operations on farms that involve fish are designed and operated with animal welfare in mind. Employees shall be trained to provide appropriate levels of husbandry;
- Drug and chemical management: banned antibiotics, drugs and other chemical compounds shall not be used. Other therapeutic agents shall be used as directed on product labels for control of diagnosed diseases or required pond management, not prophylactic purposes;
- Microbial sanitation: human waste and untreated animal manure shall be prevented from contaminating pond waters. Domestic sewage shall be treated and not contaminate surrounding areas;
- Harvest and transport: fish shall be harvested and transported to processing plants or other markets in a manner that maintains temperature control and minimises stress, physical damage and contamination; and
- Record keeping requirement: to establish product traceability, a number of data shall be recorded for each culture unit and each production cycle, including culture identification number, unit area/volume, stocking date, quantity, harvest date etc.

The standards for shrimp and channel catfish farming are similar to the tilapia standards. Shrimp hatcheries and processing facilities have differing sets of criteria given the nature of the process; however they are equally as stringent when assessing their environmental impact.

The BAP standards and certification process was developed with the draft FAO Aquaculture Certification Guidelines in mind. At present, the BAP standards and certification process are very close to meeting these requirements. Areas where the standards do not exactly match the FAO criteria include: no mention in the BAP criteria of energy efficiency of facilities, special needs of polyculture and whether gender/generation issues are considered. Animal welfare standards for tilapia and channel catfish are provided for, but are not mentioned for shrimp farms or shrimp hatcheries; which is consistent with current status of crustacean welfare standard development at OIE (World Animal Health Organisation) level.

In terms of the scope of criteria under the FAO guidelines these are minor issues and ones that could seemingly be rectified in the future. Also, since the FAO aquaculture guidelines are still in draft form, it is premature to assess full compliance or not with the guidelines for aquaculture schemes, since the content of the guidelines may be modified between now and their adoption.

1.4.3. How do they do it?

The non-profit Aquaculture Certification Council (ACC) implements GAA's BAP standards through 'process' certification for shrimp and fish production and processing facilities with a primary orientation toward seafood buyers. This international nongovernmental body accredits evaluators who carry out physical site inspections, effluent sampling and extensive procedural and record reviews. ACC also oversees an online traceability system that allows programme users to track products through the

seafood value chain. However, the role of ACC is being changed in 2009 from a certification agency into a BAP programme manager; the role of certification will be delegated to fully independent, ISO 65-accredited certification bodies. The ACC was created by the GAA which is essentially a trade organisation, so following some minor criticism over transparency, a move to fully independent certifiers such as INAB was taken. This brings the accreditation and certification process into line with the FAO guidelines, which specifies that certification bodies should be independent from the standard-setting organisation. This creates an extra layer of independence with more auditors, which in turn raises the cost of certification marginally.

The GAA Technical Committees create the BAP standards through consultation with industry experts. Stakeholders have the opportunity to comment on the standards before they are finalised, and the comments made by stakeholders are available on the website. The GAA Technical Committee incorporates comments where appropriate but reserves the right to omit suggested inclusions. The community consultation period lasts for 60 days and the draft standards are supplied on the website. The comments made by stakeholders are available on the website. The whole process of standards development is now overseen by a multi-stakeholder body, the Standards Oversight Committee, which was formed in October 2008. The Standards Oversight Committee consists of 4 industry members (e.g. Maine Aquaculture Association), 4 NGO members (e.g. Seafood Choice Alliance) and 4 academic members (e.g. California Aquaculture Centre), which aims to provide a multi-faceted approach to standard development.

Certification of facilities is currently undertaken by the ACC, although this will change to being carried out by independent certification bodies. Inspections of facilities are undertaken by trained professionals. At present, standards and certification processes exist for seafood processing plants, shrimp hatcheries and shrimp grow-out production facilities. Recently, in 2008, standards for channel catfish and tilapia were also released and standards for feedmills and salmon farms are in development. For companies to be certified, they need to undergo an annual recertification.

The standards are updated regularly. Each standard was most recently updated on the following dates: Processing plants - 9/2008, Hatcheries - 3/2007, Shrimp farms - 3/2007. All certified facilities must use specific software called Traceregister™ to manage their traceability system.

The GAA and ACC have also implemented an Integrated Operating Module, which aims to help small-scale producers become certified in less developed countries such as Thailand. This is achieved by forming clusters of small producers giving them the opportunity to pool resources and achieve certification. These clusters are aided by funding from processing companies, as they have a vested interest in sourcing certified product to meet the demands of supermarket clients such as Walmart in the US.

1.4.4. What are the results?

The GAA indicates there are benefits in terms of improving the aquaculture industry leading to reduction in reliance on wild populations. The standards are intended to result in reduced impact of aquaculture on the environment and increases in employment. As of March 31 2009, the total certified capacity of shrimp farms was 118,000 tonnes, which has been steadily increasing. 14 different countries have operations that are certified. In 2008 it was estimated that 10% of the shrimp imported into the USA were certified to the BAP shrimp farm standard. The GAA have an ultimate goal of certifying half of all global trade of farmed shrimp.

Tangible fiscal benefits from certification are not available on the website. The GAA does however infer that application of the BAP standards will lead to strong, robust production and processing methods which will lead to profitable companies. Producers tend to see benefits in terms of improved market

access rather than in terms of consistent price premiums. Buyers and retailers view the programme as a means of conveying rising expectations for environmental and social performance to their supply base and as a way of obtaining third party assurance that set standards are being met.

1.4.5. Organisational costs and funding

Individuals or organisations pay a fee to be a member of the GAA, ranging from $60 per year for individuals up to $15,000 per year for governing members. The BAP programme accounts for approximately 60% of the GAA budget, with the remainder being spent on other aims such as advocacy, conference organisation. magazine production and supporting research Extra funding for standard development is required from corporate sponsorship, conference attendances etc as memberships alone do not cover all GAA expenses.

Companies applying for certification under the BAP standards pay a certification fee (indicated below). All of these fees are paid annually, except for the $500 registration fee. Exact details of the annual operating budget were not able to be obtained online or through contact with the GAA standards director. The certification fee covers the cost of the ACC operations.

Facility	Registration Fee	Annual Inspection Fee	Annual Certification Fee
Processing plants	$500	$5000	Minimum of $2,000; then $2 for every tonne (t) over 1,000t that is exported up to a max of $12,000. Reprocessing and repacking plants that repack product from other BAP-certified facilities pay a US$1,000 certification fee
Shrimp farms	$500	$3000	Minimum of $500; then $1 for every tonne (t) over 500t produced up to a max of $4,000
Hatcheries	**$500**	**$3000**	**$5,000**

1.5. GlobalGAP

1.5.1. Background

GlobalGAP is an independent organisation that describes itself as a private sector body that sets voluntary standards for the certification of agricultural products, including aquaculture products but not wild fisheries. It is therefore both voluntary and market driven. The scheme currently covers 92,000 producers as of 2008 (including benchmarking schemes) within 88 countries.

The certification scheme is a business-to-business scheme. As such, there is no label that is visible to consumers. The GlobalGAP standard is primarily designed to reassure consumers about how food is produced on the farm by minimising detrimental environmental impacts of farming operations, reducing the use of chemical inputs and ensuring a responsible approach to worker health and safety as well as animal welfare. GlobalGAP serves as a practical manual for Good Agricultural Practice (GAP) anywhere in the world. The aim is to establish one standard for GAP with different product applications.

GlobalGAP has retailer members (and this is therefore where GlobalGAP products are sold) in the following countries: Japan, Netherlands, Germany, UK, Belgium, Italy, Switzerland, Norway, France, Spain, Sweden, Finland, Ireland, Austria, and the US.

There is a range of standards for:

- **Crops**: fruit and vegetables; flowers and ornamentals; combinable crops; green coffee and tea;
- **Livestock**: cattle and sheep; dairy; pigs and poultry;
- **Aquaculture:** salmonids; shrimp (*pangasius* and tilapia in development).

Communication

GlobalGAP has a website which explains its objectives, governance and stakeholder consultation process. It is also possible to download the GlobalGAP standards and standards in development.

GlobalGAP holds a global conference annually at which delegates can receive updates, share best practice and take part in a multi-stakeholder consultation process. GlobalGAP also hold regional communication and networking events on specific products and regional aspects. GlobalGAP hold training sessions for certification bodies and advisors/consultants. These cover the content of the system (i.e. General Regulations) and specific criteria and requirements that need to be implemented on-farm (i.e. control points). There are also 'train the trainer' courses.

1.5.2. What do they claim?

GlobalGAP promotes good agricultural practices but does not make specific claims of sustainability impacts. As it is a business-to-business scheme, it does not involve a label or direct communication with the consumer.

For aquaculture, GlobalGAP has set standards for shrimp and salmonid production. They are currently developing standards for tilapia and *pangasius*. There is no limit to the species they could cover but it is dependent on demand from their members for these standards to be developed. The main source countries for current certified aquaculture product are Scotland, Chile and Norway, mainly for salmon and some rainbow trout. Shrimp certifications are in process and include shrimp farms in Ecuador and Columbia.

There are a range of environmental criteria under the aquaculture standard covering the following issues: chemical management; water use and disposal; environmental and biodiversity impact assessment and management. Taking their shrimp standard as an example this includes ecological criteria such as environment and biodiversity, waste use and disposal and energy use. However it does

not include organic production. Public health issues are included within detailed requirements on hygiene and food safety. There are also some criteria on animal health and welfare. Social criteria are not included within the Salmonid standard, but have been developed in partnership with Oxfam for the shrimp standard.

Full details on the criteria are included within the spreadsheet. The standards are reviewed every three years.

Compliance with national and international legislation
There has been no formal review of compliance with national and international laws, regulations and agreements, but compliance with international legislation is one of the key buyer requirements. GlobalGAP promote the use of local certification bodies that are familiar with local legislation. Farmers must also know and understand local legislation. GlobalGAP have National Technical Working Groups that develop National Interpretation Guidelines for some countries and products as required. This allows for tailoring of the standard for specific products in specific countries and would involve relevant local legislation. The standards therefore cover this aspect of the FAO guidelines.

Compliance with the FAO guidelines on aquaculture certification
The FAO draft guidelines on aquaculture have been used as an input into the development of the shrimp standard. The Salmonid standard has also been reviewed against the FAO guidelines by the Sector Committee (SC) and was deemed compliant. The SC for aquaculture is made up of 15 industry representatives comprising 50% retailers (e.g. Tesco) and 50% suppliers (e.g. SeaChill).

Chain of custody
There is a chain of custody standard for each product, to ensure that any product sold as GlobalGAP-certified is produced from material that originates from certified GlobalGAP farms. The first processing after harvest has to go through the chain of custody audit. This audit checks for effective segregation of certified and non-certified produce and also that relevant hygiene standards (e.g. GFSI or BRC[118]) are being implemented. The need for chain of custody audits for the second processing step depends on buyer requirements. Because GlobalGAP does not involve labelling products for the consumer, there is no need to ensure the chain of custody all along the marketing chain from producer to consumer, but only from producer to as far along the chain as the buyers determine.

1.5.3. How do they do it?

GlobalGAP governance
GlobalGAP is governed by a board. Sector Committees discuss and decide upon product- and sector-specific issues and consist of 50% retailer and 50% producer/supplier representation. There is no formal requirement for public consultation in the development of the standards but there was stakeholder consultation during development of the shrimp standard, mainly due to the numerous issues surrounding it.

Compliance with ISO Guide 65, accreditation and certification
GlobalGAP follow the ISO Guide 65, although their compliance has not been independently verified. In order to become a certification body it is first necessary to prove sufficient capacity and compliance to ISO Guide 65 to GlobalGAP and then go through the accreditation process where this compliance is checked again. There is independence maintained between the accreditation organisation, certification bodies and GlobalGAP itself, in line with FAO guidelines.

GlobalGAP also runs an integrity programme where any issues with certification bodies or a certificate holder are investigated. This involves five staff (professional senior auditors) who spend the year travelling around the world and checking on any complaints, issues or rumoured problems. This

[118] Global Food Safety Initiative (GFSI); British Retail Consortium (BRC)

enhances the surveillance of certification bodies already undertaken by the accreditation bodies. This can lead to suspension of a certification body if a significant problem is found. There are six steps to being suspended which are clearly communicated so it is a fair and open process.

There are a number of accreditation bodies that can accredit certification bodies under the GlobalGAP scheme. These bodies must sign a MoU with FoodPLUS GmbH (the legal entity of GlobalGAP) and either be part of the European Cooperation for Accreditation (EA) or a member of the International Accreditation Forum (IAF).

Certification bodies undertake annual audits of the certificate holders (aquaculture producers and chain of custody) through site inspections and interviews. Some certificate holders may be audited more than once as certification bodies need to undertake on-the-spot checks for 10% of their GlobalGAP certification clients.

Accreditation bodies audit certification bodies. Certification bodies are audited at least every three years when the GlobalGAP standards are reviewed and it is necessary for them to reapply for accreditation. There is no formal auditing of the standard-setting body.

Consultation process
GlobalGAP allows for comment by interested parties within the standard setting process in two opportunities of 60 days : one after the initial draft proposal and the other after two trial audits. For example the tilapia standard is going through the first consultation and *pangasius* is going through the second. The draft standards are available to download from the website. In addition, from a producer's GlobalGAP number it is possible to search for and download inspection reports.

Consultation with Oxfam led to development of a social annex for the shrimp standard. However, while Oxfam agrees that GlobalGAP is improving its dialogue on who to consult it could still be more transparent.

Equivalence with other schemes
There is a detailed benchmarking scheme whereby it is possible for other certification schemes to be checked for equivalence with the GlobalGAP scheme. There are currently 18 benchmarked schemes for example ChileGAP, JGAP (Japan) and Farm assured produce (UK). Two of the accreditation bodies are able to undertake this process: The Joint Accreditation System of Australia and New Zealand (JAS ANZ) and the Office of German Accreditation System and Testing (DAP)..

Involvement of developing countries and small-scale producers
GlobalGAP has three approaches to facilitate the involvement of developing countries:

1. Group certification: this allows a number of smallholders to group together and achieve joint certification. The benefits include: reduced external inspection costs; ability to centralise requirements such as pesticide controls; the group can more easily benefit from advice; and peer pressure provides motivation to comply with the standard. 71% of GlobalGAP certified farms fall under group certification.

2. Smallholder manual: this has been created with the support of GTZ and DFID to assist with the development of internal control systems for small-scale producers. This was initially developed for smallholder horticulture producers in Kenya but includes operating procedures and templates that can be used in other sectors.

3. Feedback opportunities: GlobalGAP is providing more opportunity for developing countries to give systematic feedback through a smallholder ambassador/Africa Observer Project funded by

GTZ and DFID. This allows feedback from developing country producers to flow directly to the Sector Committees.

Compliance with WTO TBT agreement

There has been no formal assessment, but GlobalGAP are constantly reviewing the WTO negotiations and following opportunity through the Global Food Safety Initiative (GFSI) for clarification of the TBT agreement. When elaborating criteria for standards, GlobalGAP make sure the language and any translations are clear and there is no room for misinterpretation that would fall foul of the TBT agreement.

A coalition of developing countries, including Brazil and Egypt, has filed a complaint to that effect at the WTO in Geneva. They allege that private-sector standards such as GlobalGAP are an unfair trade barrier for the world's poor.

1.5.4. What are the results?

GlobalGAP certification is used by retailers and processors as reassurance that their suppliers are using good agricultural practices. These standards have been harmonised making it easier to do business. Since GlobalGAP is a business to business scheme and does not operate a label, it is careful not to make any claims of sustainability impacts.

There has been no official review of the benefits for aquaculture producers, but an independent review of the costs and benefits for small-holders pineapple producers in Africa found that the producers were able to repay the investment of certification in 2–3 years and they were able to earn more as they spent less on chemicals and improved farm management through better record keeping. GlobalGAP have heard of similar positive reviews in the aquaculture sector but no extended studies have been undertaken.

1.5.5. Organisational costs and funding

The average cost of GlobalGAP certification is £300–400 per audit. This may be less for each producer if undertaking group certification. There is also a one off registration cost of between € 10 and € 100 depending on the farm size.

Certification bodies are charged a € 300 initial application and then € 3,000 for the first scope (i.e. product area) and € 500 for each additional scope. There is also a € 150 training fee. As the number of accreditation bodies is not limited it often means that a certification body can find a local accreditation body charging more reasonable rates than international accreditation bodies. However, there is not an approved accreditation body in every country so the costs for certification bodies may be an issue in this case.

GlobalGAP operates on members fees (made up of retailers and producers). Member fees break down as following:

- Retailers: € 3,600 per year
- Individual suppliers: € 1550 per year
- Group suppliers: € 2,550 per year
- Associate members: € 1550 per year

GlobalGAP's annual operating costs are US$ 2.7 million (€ 20.5 million). The majority of this cost goes on the integrity surveillance programme and ensuring that the standard is applied consistently across the world.

2. Organic certifiers

The role of organic labels is to assess and mark those products which are derived from farms and production which use organic processes in the production system. These standards are generally not applicable to capture fisheries, but some aquaculture farms and products are achieving organic labels. The application of organic certification to capture fisheries is questionable and has not been possible in the USA for domestically-produced fish, but recently the National Organic Standards Board approved standards for organic farmed fish in the USA in November 2008[119].

2.1. Naturland

This section focuses on Naturland as an example of an organic label, but also discusses other organic labels — Soil Association, Krav and Debio.

2.1.1. Background

Naturland is an independent organisation and describes itself as an organic farmers' association. It is both voluntary and market driven. In 2006 there were 44,000 organic farmers that made up the membership. A key objective of the scheme is to promote organic agriculture. Naturland takes an holistic view of sustainability and puts equal emphasis on social, economic and environmental objectives. It has a principle of grassroots democracy and fair partnerships for farmers. They have also recently published guiding principles that describe their aim and role. This is currently being translated into English.

Certification is one of the activities of the organisation. Naturland Zeichen GmbH is responsible for granting the right to use the Naturland trademark, on behalf of the Naturland Association. Other activities include engaging in advocacy and networks to promote organic agriculture. They also provide advisory services through a separate consultancy.

The label claims that the product has been certified to Naturland standards specified for different sectors. Naturland has set standards for a range of sectors including: agricultural production; beekeeping; aquaculture; forest management; sustainable capture fishery; textiles; and cosmetics. For aquaculture, Naturland claims that the product is organically produced. For capture fisheries it claims that it is from a sustainable fishery.

There have been no internal reviews of impacts against objectives but Naturland has been the focus of some research projects which have looked at impacts. The results of these projects were not available at the time of writing.

Naturland's main market is in Germany, but Naturland products also sell in other European countries such as Switzerland, UK and France. In some cases these may not be sold under the Naturland label, for example Naturland-certified products are often re-branded under the Soil Association mark for the UK market.

Naturland has a website which gives details on its objectives, standards and other advocacy work to promote organic agriculture e.g. engaging in networks and conferences. Other communication activities include writing articles and being involved in legislation development (e.g. the draft EU Aquaculture regulation).

[119] http://www.washintonpost.com/wp-dyn/content/article/2008/11/19/AR2008111903787.html

Other organic schemes

The International Federation of Organic Agriculture Movements (IFOAM) has 750 member organisations in 108 countries, and aims to further the interests of the organic agriculture movement worldwide. They provide the Organic Guarantee System (OGS) to guarantee the integrity of organic standards and promote harmonisation between schemes. The OGS includes IFOAM Basic Standards and Accreditation Criteria.

Other organic certification schemes that cover fish products include KRAV, the Soil Association and Debio. KRAV's aim is to produce high-quality products in a sustainable manner and to do so in a credible and reliable way. They develop organic standards and standards for sustainable fishing. Debio is based in Norway and has been delegated responsibility for the certification of organic agriculture by the Norwegian Food Safety Authority. The main aims of the organisation are to safeguard and promote organic production, marketing and consumption. The Norwegian regulations on organic aquaculture were developed in cooperation KRAV and there is mutual recognition between Debio and KRAV. The Soil Association is based in the UK with a goal to promote the highest levels of organic integrity.

Krav's main market is Sweden, Soil Association focuses on the UK and Debio on Norway. Many of these organic organisations have partnerships with each other, so that if a farm is certified by Naturland it can be re-certified by Soil Association for marketing in the UK by re-assessment of the inspection report rather than another inspection visit. There is thus some harmonisation and mutual recognition of standards within the organic sector.

KRAV certify a range of products including crops, livestock, apiculture, wild harvests, textiles, mushrooms, aquaculture and wild fisheries. Debio covers agriculture, forestry and wild products and aquaculture. The Soil Association probably has the greatest range certifying crops, livestock, textiles, cosmetics, timber and wood products, gardening products and aquaculture (although it does not cover wild fisheries).

Krav has specific standards for Salmonid fish, the perch family, and blue mussels (common mussel). Krav's wild fisheries has currently focused on Swedish fisheries, including cod fillet, tinned herring, fresh shrimp and fresh crabs from Scandinavian waters. Debio covers certification of salmonids, perches, and gadoids (cod) aquaculture species. The Soil Association has individual standards for salmon, shrimp, mussels, carp and trout. A Tilapia standard is being developed.

	Naturland	KRAV	Debio	Soil Association
Aquaculture				
Carp	✓			✓
Salmonids	✓	✓	✓	✓
Mussels	✓	✓		✓
Shrimp	✓			✓
Tropical fin fish (tilapia/catfish)	✓			(in development)
Croaker/drums	✓			
Seabream/sea bass	✓			
Perch		✓	✓	
Cod			✓	
Wild-caught fish				
Cod		✓		
Herring		✓		
Shrimp		✓		
Crab		✓		
Perch (Nile Perch)	✓			
Seith		✓		

Krav aims for trade of organic products that promote environmental, social and economic sustainable development. Debio's aim is for natural resources to be managed in such a way that negative effects on the environment are avoided and for production to be based on organic, economic and social objectives. The Soil Association does not make sustainability claims but aims to set the 'gold standard' for the organic industry.

The KRAV aquaculture and fisheries standards do not deal with economic criteria but go into detail on fuel efficiency and prevention of water pollution offering a life-cycle assessment. Debio's standards include detailed ecological criteria but do not include any social or economic criteria. Soil Association covers ecological criteria in detail but does not cover economic criteria. There is a separate ethical standard that is required for any air freighted produce or that can be applied voluntarily.

2.1.2. What do they claim?

Naturland's first claim is to support organic agriculture. They also claim to support sustainability and define this in terms of ecological, social and economic sustainability.

Naturland have defined sustainability for capture fisheries:

'Sustainability in the ecological sense means that the fishery is performed in such a way that integrity of the ecosystem is maintained long-term, concerning both the stocks of the economically relevant species as well as the other components of the ecosystem. A further aspect is to ensure that fish remains a particularly healthy, high-grade source of nourishment, one which we cannot allow to deteriorate as a result of environmental pollution or questionable processing methods. Sustainability in fishery in the social sense means that those employed in this industry meet with fair working conditions, and that the living conditions of other members of the same community are not adversely affected. Sustainability in fishery in the economic sense means that the marketing of fish encourages stable business relationships distinguished by the mutual sense of responsibility of all the members of the value chain towards each other.'

Within aquaculture Naturland has defined specific criteria for:

- carp;
- trout, salmon and char;
- mussels;
- shrimp;
- tropical fin fish (including tilapia & catfish); and
- codfish, seabream, croaker/drums.

A wild-fish standard has also been produced and is being tested with Nile Perch originating from Lake Victoria, Tanzania.

For future development of aquaculture standards, Naturland are also looking at micro-algae, scallops/oysters, and fresh water carp. Indoor aquaculture systems may also be a potential for the future. In terms of wild-caught fisheries, Naturland are currently looking at the potential for the freshwater Amazon fish Arapaima from Brazil, and have been approached by other perch fisheries on Lake Victoria, as well as Central Asian inland fisheries and fisheries in Chile and Brazil. They are also considering both farmed and wild ornamental fish.

Naturland source countries

Naturland are currently certifying capture fisheries in Tanzania and have certified culture fisheries (aquaculture production) in Vietnam, Ecuador, Peru, Brazil, Thailand, Indonesia, Israel, Honduras, Germany, France, Spain, Chile and Ireland.

The species breakdown is as follows:

- Trout: Germany, France & Spain;
- Salmon: Ireland;
- Shrimp: Ecuador, Peru, Brazil, Vietnam, Thailand & Indonesia;
- Tilapia: Israel, Ecuador & Honduras;
- Catfish/*Pangasius*: Vietnam;
- Mussels: Chile;
- Sea bream/sea bass: Greece;
- Red drum: Israel.

Capture fisheries

Naturland has a set of general criteria for wild-caught fish but then requires the development of project-specific conditions for each fishery. These are developed by a series of experts representing scientific institutions; fisheries authorities; NGOs and organisations from the fishing or processing industry. These conditions must be reviewed every 2 years. There has only been one pilot project to date (Nile Perch from Bukoba landing site, Lake Victoria, Tanzania) so examples are drawn from this.

Environmental criteria within capture fisheries include the following requirements:

- Fisheries must be undertaken to maintain the integrity of ecosystems;
- The fishery must not lead to overfishing;
- Management must implement the standard requirements.

Social criteria within the capture fisheries standard include*:*

- Fair working conditions for fishermen (e.g. adequate board and lodging; access to banking services; access to health care, schooling and transport possibilities)
- Within the specific Nile Perch project standard some of these requirements are further specified for example health services must be within 60 minute travel and all children between the ages of 7–14 must be able to attend primary school. There are also targets for use of life jackets, basic hygiene in fishing communities and availability of drinking water as well as access to HIV/AIDS services.

Economic criteria within the capture fisheries standard include*:*

- Fish prices must be transparent along the value chain;
- Participating beach management units (BMUs) can supply the processors directly rather than going through agents.

Within the wild-caught fisheries although the standard requires that managers of the fishery implement the requirements within the Standard, it does not go into detail on required levels of management capacity. Some primary data are used (catch data which is part of an ongoing monitoring programme) but mainly relies on LVFO advice rather than undertaking an independent stock assessment.

The specific Nile perch project standard says: 'There must not be any indication that the Nile Perch stock is in danger of extinction or that the fishery as a whole in on a decline'. Naturland have assessed that based on LVFO assessments; fishermen monitoring and biological research; and given that it is an artisanal fishery; they are confident that the stock is moderately to fully exploited, but that there is no risk of a stock collapse. There has been no conclusive stock assessment for the lake and draft assessments undertaken by MRAG under the EU- funded IFMP project (Implementation of a Fisheries Management Plan) suggested that there is risk of a severe decline if fishing effort continues at the current pace or increases. Naturland agree that the stock may be past MSY but do not feel that it is endangered.

In terms of the FAO guidelines the capture fisheries standard is still being piloted so it may be too new to compare, but Naturland are quite confident that it complies. On a general level, it covers the three main aspects of the requirements (impact on the stock, impact on the environment and management system).

Aquaculture
Environmental criteria within the aquaculture standard include:
- Organic methods;
- Site selection to reduce ecological impacts;
- Water purification;
- Prohibition of hormones and regulated chemical use.

Fuel efficiency is not covered in depth but it is specified that water exchange should be moderated to reduce fuel use. Energy consumption also has to be recorded and considered during use of machinery.

Animal welfare issues are covered in depth and include aspects related to providing a natural environment for the animals and reducing stress.

Food safety issues are also covered indirectly through requirements on hygiene, organically raised broodstock, monitoring of water quality (for mussels) and maintenance of a strict cold-chain.

Further details on the criteria are presented in

Naturland believe that in terms of compliance with the FAO guidelines, they are in the lead in this area and exceed the guidelines. However their main reference is IFOAM for organic production rather than the FAO guidelines.

Compliance with national and international legislation
As a private label, Naturland is not concerned with international and national legislation. It is important for the farmers and processors to know the legal requirements but Naturland does not consider that it is it's role to tell if they are compliant with legislation. However, this goes against the FAO guidelines, which specify that ecolabelling and certification schemes should include criteria to verify that production facilities comply with relevant national, regional and international legislation.

Chain of custody
Inspections are undertaken to audit the chain of custody and requires documentation. Transaction certifications are required to accompany merchandise specifying products, producers and buyers and guarantees it is a Naturland product.

2.1.3. How do they do it?

Naturland promote organic agriculture through their certification programme. For aquaculture production there are general regulations and specific criteria for particular species. For capture fisheries, Naturland has a general standard and then develops specific criteria for each 'fishery project'. This is done by a group of experts representing the relevant fisheries management authorities, NGOs, processors and scientists.

Naturland sets the standard and undertakes an initial review based on a producer questionnaire. Naturland then order an independent inspection. The inspection report is sent to Naturland with a recommendation for certification or not. The Naturland certification committee make the decision on certification as well as approval for re-certifications after the annual audit. Certification bodies need to be accredited to the ISO Guide 65.

Naturland is accredited to the ISO Guide 65. Inspection bodies[120] also have to be accredited to ISO Guide 65. The accreditation organisation that they can use is not limited. Any ISO Guide 65-accredited organisation can be a Naturland certification body.

Range of criteria
The Naturland standards cover ecological, social and economic sustainability.

Audits
Audits are carried out on Naturland (the standard setter) by ISO65 and IFOAM. Audits are carried out on the inspection bodies by the accreditation bodies. Certificate holders are audited annually by the inspection bodies. Information for the Naturland certification process is collected by site visits and producer questionnaires.

There are annual inspections against the Naturland standards, and the specific project standards need to be reviewed every two years.

In the case of Nile perch the draft standards did not require them to undertake a stock assessment but use information already available. Ecological sustainability has been measured both through an ongoing data collection programme (looking at catch rates and size distributions) and the use of secondary data from the LVFO which is responsible for overall research, stock assessment and management of the lake.

Consultation
There has been limited consultation on the development of standards for aquaculture species (although Naturland keep up a constant dialogue with NGOs). By contrast there has been considerable consultation with stakeholders on wild-fish standards through the expert group. The wild fishery standard also states that Naturland publishes the inspection report (which is relevant to the public) on its home page at least four weeks before the meeting of the committee where certification is decided. The enterprise is then given an opportunity to reply to any objections raised. These have recently been uploaded for the Nile Perch fishery. This is not the same for organic aquaculture, which, as private enterprises (and not open as with wild fisheries) involvement of stakeholders at this stage is not seen to be so critical.

No specific assessment has been contested, but the anti-shrimp farming movement (e.g. Shrimp Action Network and the Mangrove Action Project) in general disagrees that any shrimp farm (and particularly any using industrial methods) should be certified. However larger NGOs (e.g. Greenpeace and WWF) are supportive of Naturland's work.

Equivalence with other standards
Naturland cooperates with other organic labels that want to re-brand an aquaculture product under their label i.e. to be more appropriate for other markets. This cooperation includes sharing audit reports and trying to make the conversion cost neutral. These partnerships are continually being developed and updated. Naturland has developed equivalence for other products (e.g. coffee) but there are currently too few aquaculture projects to justify the investment required to do this.

Involvement of developing countries and small-scale producers
Naturland has developed a manual to give guidance on internal control systems for small-scale farmers. There have also been a number of projects with GTZ to assist small-scale aquaculture farmers to reach the standard e.g. in Vietnam. Naturland often works with cooperatives and the links have come through exporters and the private sector in Europe. There are often agreements that the exporter will pay a better price for the product. For the wild-fish standard, as a project-specific standard needs to be

[120] Naturland refer to 'Inspection bodies' rather than certification bodies. This is because these agencies are responsible for undertaking the audit, but the Naturland Certification Committee makes the final decision on whether certification goes ahead.

developed it can be tailored to the need of the developing country and for small-scale or artisanal producers.

2.1.4. What are the results?

Naturland claims that it has made a significant imprint on the history of organic agriculture and provided important impetus, opening up new fields such as organic forestry management and organic aquaculture.

Naturland have developed different labels for aquaculture and wild-caught products to avoid confusion. They also undertake promotion programmes through trade fairs, press conferences and flyers that are distributed through retailers.

A price premium is not guaranteed but is often associated with organic produce. For the Nile perch fishery it was hoped that the Naturland label would result in 10-20% price premium of which 3-5% could be reinvested into social improvements within fishing communities[121].

Naturland has published a report (with other partners) setting out the benefits of organic agriculture to poverty reduction in developing countries.

2.1.5. Organisational costs and funding

Within the Naturland certification scheme, fisheries and aquaculture projects pay an annual membership of €500. For the use of the logo, members pay an annual fee based on their net sales. This is 1% on average but can be less in some circumstances e.g. for feed and larvae for domestic markets. Annual inspection costs are around €150–350 plus travel. Costs are also incurred to reach standards. Naturland are funded almost entirely through their membership fees, with an operating budget of approximately €1.5–2 million/year. However in addition to this, specific projects (e.g. the Nile perch project) are often funded through public and private funds.

[121] Source: Iain Pollard consultations with Anova and Vic Fish, July/August 2008.

3. National standards

A number of government agencies are also involved in providing fish sustainability information. These schemes vary from those that provide information on stock sustainability, management and environmental impacts of fisheries and aquaculture operations, similar to NGO-led schemes, to those that provide a standard for fisheries or aquaculture operations to meet, with or without an associated label.

3.1. Australian Government Department of Environment, Water, Heritage & the Arts

3.1.1. Background

The Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (the EBPC Act) contains a requirement for all Australian Commonwealth-managed fisheries and all Australian State-managed fisheries that occur in Commonwealth waters and/or have an export component to be accredited as being consistent with the wildlife trade provisions of the EPBC Act before being able to export seafood products. To our knowledge Australia is the only such country to subject its fisheries to a statutory 'environmental test' before allowing them to export. The accreditation provisions relate only to Australian fisheries, and do not apply to imported fisheries products coming into Australia.

In practice, consistency of Australian fisheries with the EPBC Act is measured against specific guidelines — 'Guidelines for the Ecologically Sustainable Management of Fisheries'[122] ('the Guidelines'). Fisheries are assessed as a whole, rather than assessing individual species within a fishery. To date, a total of 121 Australian fisheries have been assessed under the EPBC Act assessment process.

The overarching objective of the EPBC fisheries strategic assessment process is to ensure that, over time, Australian wild catch fisheries are managed in an ecologically sustainable way.

3.1.2. What do they claim?

The EPBC Act fisheries strategic assessment process covers wild catch fisheries only; there are no plans to expand into aquaculture in the foreseeable future. The process assesses the capacity of the management regime to ensure that fisheries are managed in accordance with the objectives of the Act over time, and includes an assessment of their impacts on target species, bycatch and the broader ecosystem. The Department for Environment, Water, Heritage and the Arts (DEWHA) do not claim that accredited fisheries are 'sustainable', nor does assessment result in a specific 'ecolabel'. Rather, fisheries whose management is consistent with the wildlife trade provisions of the EPBC Act are declared approved Wildlife Trade Operation (WTO) operations under part 13A of the EPBC Act. This allows fisheries to continue to export fisheries products.

Given the legislative nature of the scheme, compliance with relevant international laws and obligations is checked by the Australian Government during the legislative drafting process. Compliance of individual fisheries management regimes with relevant RFMO and other national and State regulations is addressed in State and Commonwealth fisheries agency submissions against the Guidelines and assessed by DEWHA.

Economic and social issues are not considered in the assessment.

[122] see http://www.environment.gov.au/coasts/fisheries/publications/pubs/guidelines.pdf

3.1.3. How do they do it?

As noted above, the ability of each relevant Australian fisheries management regime to ensure sustainability over time is measured in practice against the Guidelines. The Guidelines consist of two principles — broadly relating to the impacts of the fishery on (i) target species and (ii) on bycatch, habitats and the wider ecosystem — and related objectives which set performance benchmarks. For example, Principle 1, Objective 1.1.4 in relation to assessment of target species stocks requires that '*there is a robust assessment of the dynamics and status of the species/fishery and periodic review of the process and the data collected. Assessment should include a process to identify any reduction in biological diversity and /or reproductive capacity. Review should take place at regular intervals but at least every three years'*). The process of assessment is usually initiated by the relevant fisheries management agency preparing a submission to DEWHA reporting on the performance of the fisheries management regime against the Guidelines. Agency submissions are then assessed by DEWHA who provide a formal assessment report and recommendation to the Minister for decision in relation to export approval. The decision may be taken by the Minister or a delegate.

Assessment decisions can take a number of forms, ranging from very short term WTOs with many conditions and recommendations; to the maximum period for a WTO, three years, with few conditions and recommendations; through to 5 year exemptions without conditions for fisheries that are assessed as low impact and well managed. Currently 50 of the 121 fisheries accredited under the EPBC Act are 'exempt fisheries'. A new assessment process is carried out at the expiry of each export approval or if significant changes are made to the management arrangements of the fishery.

A number of measures appear to have been taken to promote transparency and accountability in the assessment process, as well as encouraging public involvement. Assessments themselves are undertaken by DEWHA, which is an independent Australian Government Department with no financial interest in Australian fisheries. Fisheries assessments are funded from Australian Government consolidated revenue, rather than client funding. DEWHA is subject also to periodic review by the Australian National Audit Office (ANAO) as well as parliamentary oversight and a number of other structured accountability mechanisms (e.g. biannual Senate Estimates hearings).

All major documentation associated with the assessment process, including the Guidelines (which include an overview of the assessment process, submission requirements for fisheries assessments and the Principles and Objectives, amongst other things), agency submissions on each fishery, DEWHA assessment reports and Ministerial decisions, are published on the DEWHA website. DEWHA assessment reports for each fishery are subject to a minimum statutory public comment period of 20 business days for Part 13A assessments (export), and 28 days for Part 10 assessments (strategic assessments for Commonwealth fisheries). Decisions of the Minister (or delegate) are subject to parliamentary oversight and challengeable through the Commonwealth Administrative Appeals Tribunal. To encourage public involvement in the process, DEWHA also maintains a register of interested parties who are notified as fishery agency submissions for a new assessment round are made available for public comment.

The 'standard' associated with the assessment process — i.e. the Guidelines — does not prescribe specific reference points or limits. Rather, the principles and objectives are designed to measure the ability of fisheries management regimes to ensure the ecological sustainability of fisheries over time, and allow for fishery- and species-specific management arrangements. The assessment process encourages fisheries agencies to base their management decisions on best available science, and to use the latest scientific information in the preparation of assessment reports. Failure to use relevant recent scientific information is likely to be exposed during the assessment process, particularly in more controversial fisheries which receive a higher level of public attention. It is worth noting that while the EPBC fisheries assessment process is not a 'certification' scheme, no separation exists between the

'standard setting' body and the 'certification body' — both of these functions are undertaken by DEWHA.

While no specific arrangements are in place for small-scale or data-deficient fisheries under the Guidelines, a key provision in the EPBC Act is the application of the precautionary principle. With this in mind, where significant data limitations exist for a fishery, DEWHA assessments tend to take a more precautionary approach, such as granting a Wildlife Trade Operation (WTO) for a shorter period possibly with more conditions and/or recommendations. Assessments to date have adopted a 'continuous improvement model', whereby the conditions and recommendations placed on WTO approvals and exemptions are designed to improve management arrangements over time. Some or many of these conditions may encourage the acquisition of better information about the fishery.

No formal system of traceability is currently in place for 'accredited' fisheries, however DEWHA has a monitoring, compliance and enforcement capacity that includes enforcement of the fishery provisions of the EPBC Act. The absence of a formal traceability scheme may reflect the fact that few fisheries have been denied export approval, but this may become a significant issue in future if fisheries for the same species receive different assessment outcomes (i.e. one is allowed to export and one is not).

While no specific performance indicator in relation to monitoring, control and surveillance is included in the Guidelines, fisheries agencies are routinely expected to report on their compliance arrangements, as well as any specific compliance risks associated with the management system and actions taken to address the risks. DEWHA often specifies conditions and recommendations for the fishery management agency to address in relation to potential compliance risks in a fishery. For example, a condition or recommendation might require the implementation or improvement of a data validation program that might include observer coverage or catch disposal records.

The Guidelines do not specifically promote 'optimal utilisation', however they do require that 'the fishery shall be conducted at catch levels that maintain ecologically viable stock levels at an agreed point or range, with acceptable levels of probability'. 'Traditional knowledge' itself is not usually a factor in assessments, although traditional fishing groups are free to submit comments on assessment reports and challenge decisions taken under the strategic assessment process.

3.1.4. What are the results?

The DEWHA website suggests the strategic assessment process under the EPBC Act will 'ensure that, over time, fisheries are managed in an ecologically sustainable way', however the tangible benefits have not been well assessed. Anecdotal evidence suggests the scheme has assisted in catalysing a range of changes to fisheries management including a shift in focus away from target species-based management to an ecosystem-based management approach. Anecdotal information also suggests that the introduction of the programme has allowed fisheries management agencies to undertake a range of management actions that would have ordinarily been difficult or impossible without the backing of environmental legislation.

The scheme does not claim to result in specific economic and social benefits other than the broader benefits to the Australian community associated with the maintenance of sustainable fisheries and ecosystems. No assessment has been undertaken of whether the scheme results in a price premium for 'accredited' fisheries, although given that little market based promotion of the scheme has been undertaken either domestically or internationally we consider this unlikely.

The principal benefit for 'accredited' fisheries is the ability to export seafood products for a defined period of time, however this is balanced against the costs associated with meeting any conditions and/or recommendations applied as part of assessment decisions.

3.1.5. Organisational costs and funding

The majority of the costs associated with the assessment process has been borne by Government, both Commonwealth and State. Costs associated with the preparation of agency submissions are largely borne by the relevant fisheries agency, although costs may be recovered from industry to some extent. Costs associated with assessment are borne by the Australian Government through consolidated revenue. A large number of external agencies and funders provide research information used in the assessment process.

Costs associated with assessment conditions and recommendations are largely borne by industry and the relevant fisheries management agency. No specific allowance is made for small-scale fisheries, however consideration is given to the capacity of industry and management agencies to implement any conditions or recommendations.

3.2. Thai Quality Shrimp

3.2.1. Background

Thai Quality Shrimp is a scheme by the Department of Fisheries (DOF) of Thailand. It is delivered by the DOF's Marine Shrimp Culture Research Institute and draws on many other institutes and divisions within the DOF. A comprehensive website in Thai, with main sections and key documents also available in English, is the principle instrument for publicising the scheme internationally. Local training and capacity-building activities complement the website.

Thai Quality Shrimp is restricted geographically and by the species it covers to marine-shrimp aquaculture in Thailand. The scheme consists of two elements:

(i) The Thai Quality Shrimp label is awarded to products that wholly comply with the Code of Conduct that was developed by DOF for marine shrimp farming in 1998. It covers all aspects of production, from hatcheries to final processor, and has an emphasis on environmental sustainability. The DOF Code of Conduct claims to comply with Article 9 of the FAO Code of Conduct for Responsible Fisheries (on aquaculture development), as well as with CODEX and ISO 14001/(EMS).

(ii) In parallel, a shrimp farm certification programme was developed for Good Aquaculture Practice (GAP) which has an emphasis on hygiene and food safety and responds to importing countries' requirements. Conceptual guidelines, good practice and standards, together with training and auditing systems, have been established.

The programme is running in all shrimp farming provinces and membership is voluntary. Auditing and certification is conducted by DOF.

3.2.2. What do they claim?

Thai Quality Shrimp covers all of the marine shrimp farming activity in Thailand, inclusive of farms using low salinity brackish water in freshwater areas for marine species. The main species are black tiger shrimp (*Penaeus monodon* Fabricius, 1798) and white shrimp (*Litopenaeus vannamei* Boone, 1931). Although some of the broodstock are collected from the wild, the scheme is not concerned with capture shrimp fisheries. The DOF Code of Conduct assessment covers elements of the three main categories in the minimum substantive requirements of the FAO guidelines for ecolabelling of fisheries. The GAP scheme only focuses on food safety and quality.

They provide advice on marine shrimp production and processing for Thai businesses. Environmental criteria include ecosystem (mangroves) conservation and restoration and water discharge (effluents and farm water management).

The scheme's compliance and/or conformity with relevant national and international laws, regulations and agreements have been checked.

3.2.3. How do they do it?

Thai Quality Shrimp is a voluntary certification scheme. Audits are carried out by DOF for all aspects of the production including: feed sources, traceability, transport, processing and marketing. Some information from other schemes (such as mandatory standards developed for the industrial sector as a whole, including industrial wastewater standards) is used for a limited part of the chain (e.g. HACCP certification for processing plants) but most information is specifically collected for certification.

The scheme claims to be comprehensive in its certification criteria but appears to be fairly superficial on a number of matters e.g. the use of fish and fish products in feed and conversion factors as such are not

explicit criteria. Other aspects where the certification is superficial is on the quality of effluents, and in particular that of brackish water in freshwater areas. The criteria do not appear to take into consideration the cumulative impact but rather focus on the marginal contribution of a farm. There appears to be little consideration for temporal variation e.g. in effluent quality, and it is unclear how variation within a farm is handled.

The standard-setting procedures ensure transparency, avoidance of conflicts of interest and allow for participation by all interested parties through consultations of stakeholders at the drafting stage on the proposed standards to include processors, growers clubs and associations, as well as consumers. The standard was set by an independent committee. DOF adopted implementation of the scheme under the ISO Guide 65 and will apply for accreditation as certification body. The scheme in said to be in accordance with international standards (e.g. ISO, CAC and WTO principles). Audits of the standard-setting body, accreditation body, certification bodies and certificate holders are not carried out. To ensure that the best scientific evidence available is used in the standard, it is revised at least once every five years.

The DOF Code of Conduct and GAP standards criteria and performance indicators adequately assess the minimum substantive FAO criteria from the draft aquaculture guidelines relating to food safety and quality inclusive of the location of facilities, feed contamination avoidance procedures, carry over of potential hazards to human health, monitoring of hazards, comprehensive traceability systems and general good hygiene. In relation to environmental integrity, the DOF Code of Conduct criteria and performance indicators are adequate, with the exception that there is no requirement that an environmental impact assessment be carried out prior to the approval of the aquaculture operation. The DOF Code of Conduct criteria and performance indicators related to social responsibility are also adequate. The scheme includes special provisions to ensure the participation of resource-poor small-scale farmers. Assessment and certification are free of charge to the farmers.

Certified farms and production chains are listed on the internet, and the lists are regularly updated.

3.2.4. What are the results?

There have been improvements in environmental impact of the brackish/sea water aquaculture, for example in ponds in rice growing areas over the past few years, but it is unclear to what extent this can be attributed to the scheme. Disease control has greatly improved over the past decade, and most major export markets are open to Thai marine shrimp, which is certainly to a large extent an achievement of Thai Quality Shrimp. The success of the DOF Code of Conduct scheme is very limited with less than 125 (out of 30,000 farms) Thai Quality Shrimp labels awarded (December 2008). The potential economic benefits both for the sector as a whole and for the individual farmers are clearly not appreciated by the producers and processors. The GAP scheme is much more successful (about two-thirds of all producers are certified), since it contributes to and directly maintains the exportability of the products. Therein lays its main economic benefits.

GAP farm produce do not command a premium price. DOF Code of Conduct certified produce most likely do but no information was available.

3.2.5. Organisational costs and funding

The project to establish Thai Quality Shrimp received a government annual budget of 150 million Baht (US$ 4.285 million) over the first 4 years. The current cost is unclear but probably similar. Certification of farmers and processors is free to them and funded by the Government. Cost of participating in the scheme is hence not an obstacle to the farmers.

3.2.6. Additional comments

The Thai Quality Shrimp scheme has been developed mostly in response to demands and problems related to continued access to export markets where 95% of the production of marine shrimp production is destined for. The scheme has been designed and is certified by DOF. Criteria for certification are sometimes superficial, ambiguous (e.g. 'must be located far away from pollution sources') and focus on meeting product quality criteria rather than production system quality.

4. Recommendation lists

There are many NGOs operating sustainable fisheries initiatives and seafood recommendation lists. The general aim is to provide consumers with sustainable options in their seafood purchasing and increase awareness of the sustainability issues surrounding fisheries. The desired impact is to increase demand and volume of fish sold from sustainably-managed fisheries. There are different NGOs publishing sustainability information, either:

- Those which are environmentally-orientated whose remit includes the marine environment;
- Marine-focused organisations with a seafood remit,
- Organisations specifically orientated to provide information and deal with fisheries and seafood.

The information provided by the organisations varies. The information is mainly aimed at consumers, but is also transferrable to businesses and some provide assistance for use in policy making. The information services vary from the provision of a detailed comprehensive guide of fish species and the individual stock status within the species, to provision of consumer 'guides' or 'lists' of fish to avoid eating including how purchasing choices can assist the sustainable seafood industry.

This review looked at seven organisations within this category.

4.1. Australian Marine Conservation Society (AMCS)

4.1.1. Background

The Australian Marine Conservation Society (AMCS), a not-for-profit charity and NGO that aims to enhance the conservation of Australia's marine environment. Their key focus is to advocate for more marine national parks, make Australia's fisheries sustainable and protect and recover threatened marine species.

AMCS's Sustainable Seafood Guide ('the Guide') aims to promote sustainable fisheries and marine conservation by encouraging consumers to choose seafood species that are more sustainably produced. Over 60 seafood species, or species groups, are included in the Guide and categorised as either 'say no', 'think twice' or 'a better choice'. The guide uses a simple traffic light colour coding scheme to denote the three categories. The Guide also provides descriptions and comments on the sustainability of various fishing and aquaculture methods.

The scheme does not provide an 'ecolabel' to the species categorised as 'a better choice', nor does it establish standards for certification of fisheries. Rather, the scheme provides information on the relative sustainability of seafood species, aimed at consumers.

Species or species groupings included in the Guide are restricted to those available in Australia, and include both wild fishery and aquaculture products.

This review of AMCS is based only upon publically-available information, as the review team did not receive feedback from AMCS enabling a thorough review of their process and materials i.e. further details or internal documents.

4.1.2. What do they claim?

The Guide provides sustainability information on approximately 60 species, or species groupings (e.g. 'wild catch prawns' is a single group), of which approximately three-quarters are wild catch and one quarter are produced from aquaculture. The Guide also provides a brief overview of the potential impacts on wildlife and habitats associated with a range of fishing gear types. As an example, all sea cage aquaculture is categorised as 'say no'.

While the main purpose of the guide is to present information on the ecological sustainability of seafood species, a section is included called 'Seafood and Your Health'. This section provides advice on the main sources of seafood contamination — human made toxins, natural toxins and poor handling practices — as well as government recommendations in relation to limiting consumption of some species due to mercury concerns etc. The Guide also provides information on environmental issues associated with aquaculture such as effluent discharge and fish escapes, as well as sections on 'seafood labelling', 'seafood imports', 'supermarket seafood', 'marine national parks and sustainable seafood', 'shifting baselines and our seafood' and 'commonly asked questions'.

The Guide does not consider social or economic issues.

4.1.3. How do they do it?

The purpose of the scheme is explained adequately, i.e. to provide seafood consumers with information on the sustainability of a range of harvested and farmed species. However, only cursory information is provided on the 'standards' upon which the sustainability advice is based. These are shown in the table below. No criteria other than these, or further details, are given. Likewise, no formal definition of 'sustainability' is provided.

Table 16 Criteria for categorising species according to the Guide's categories

Category	Wild fishery species	Aquaculture species
'Say no'	'listed by the Bureau of Rural Sciences (BRS) as 'overfished' or are of significant conservation concern to us'	'grown in sea cage aquaculture'
'Think twice'	'heavily targeted, regionally overfished or prone to overfishing. They may also be caught in fishing gear which damages the seafloor or impacts on ocean wildlife'	all species (mostly prawns and barramundi) grown in 'aquaculture farms'
'A better choice'	'still may be of conservation concern, however we consider that they represent a better seafood choice'	'grown using methods that are relatively benign as long as the scale of the industry remains small'

Categorisation of species under the Guide appears to be a passive process, with decisions made internally within AMCS. From the evidence available, it appears there is no process to allow for public participation or formal objection to the categorisation in the Guide.

The information upon which categorisation is based is not well referenced. A generic list of 'Information Sources' is provided in the Guide but none of these are referenced against specific species or fisheries. Some 'say no' species note that they are classified as overfished by the BRS, although the year of the Fishery Status Report is not identified. A number of other generic statements are made, e.g. 'Australia's fisheries will not be sustainable without marine national parks' and 'Marine scientists tell us that we must protect between one-fifth and one-half of all our ocean habitats in marine national parks', without references. Generic web links are provided for a range of Government and non-government organisations on the AMCS website, although none of these specifically refer to the information in the Guide. Links to many of the sources nominated in the Guide are not present (e.g. State Fisheries Agency fishery status reports). On this basis, it would appear difficult for an 'average seafood consumer' who is not familiar with Australian fisheries management and literature to trace the source material upon which specific categorisations have been made.

The scheme does not specifically identify 'data deficient' fisheries, however it does note that little is known about aspects of the biology/life history of some species. A number of species, or species groupings, are included in the guide for which there is likely to be insufficient data to perform a typical stock assessment.

No mention is made of equivalence in the Guide, however the MSC-accredited Western Rock Lobster Fishery is included under the category a 'better choice'. Similarly, the Guide notes in the 'Seafood Imports' section that 'imported seafood labelled with the Marine Stewardship Council blue logo comes from fisheries actively working to become more sustainable. MSC labelled products represent a better choice'.

A range of measures appear to be used by AMCS to promote the Guide. Perhaps most notably media releases are issued around peak periods of seafood demand to encourage 'sustainable' seafood consumption.

4.1.4. What are the results?

The purpose of the Guide is clearly to achieve marine conservation outcomes by encouraging 'sustainable' seafood consumption, but few specific claims of environmental benefit are made. It is not clear whether AMCS have conducted any independent research to assess whether the Guide has influenced the seafood choices of Australian consumers.

The Guide does not claim to result in social or economic benefits.

No information is available to suggest categorisation as 'a better choice' in the Guide results in a price premium.

4.1.5. Organisational costs and funding

The Guide advises that AMCS's 'conservation work is funded by our generous Sea Guardian supporters, and by philanthropic organisations such as the Myer Foundation'. The Sea Guardian scheme allows individuals or families to sign up as 'Sea Guardians' for a tax deductible donation of at least AUD$ 20/month or AUD$ 30/month respectively. A range of AMCS related information and products, including a copy of the Guide, is provided upon joining. The magnitude of philanthropic funding the organisation receives is unclear. A separate scheme is in place for businesses to sponsor AMCS at 'platinum', 'gold' and 'silver' levels for tax-deductible contributions of AUD$ 490, $ 220 and $ 65 per month respectively, however it is not known how many businesses contribute.

No separate funding sources for the Guide are identified. Notwithstanding that, we note that the Guide costs AUD$ 9.95 per copy (or 3 for AUD$ 25) and some costs of production may be recovered directly.

The total annual operating budget of the scheme is unknown.

Given the nature of the scheme, no charge is incurred for including fisheries/species in the Guide. Likewise, no arrangements are needed to ensure cost is not an obstacle to inclusion for small-scale fisheries or aquaculture systems.

4.2. Greenpeace

4.2.1. Background

Greenpeace is an independent global campaigning organisation whose aims are to protect and conserve the environment. Greenpeace has been campaigning against environmental degradation since 1971 and aims to expose environmental problems and to challenge government and corporations who do not live up to their mandate to safeguard the environment. Greenpeace International leads global campaigns and provides strategic support to the national and regional offices and is based in Amsterdam. Greenpeace is present in 40 countries across Europe, the Americas, Asia, Africa and the Pacific. Protecting the marine environment is one sector of their activities and, behind climate change, is the second highest receiver of funds. The key areas that they address in their 'defending the oceans' campaign are: marine reserves; whaling; bottom trawling; pirate fishing; overfishing; tuna; fair fisheries; bycatch; pollution; global warming; seafood; and aquaculture.

Greenpeace are not a 'scheme', 'certifier' or 'label', instead they provide international and national lists of fish to avoid known as the 'Redlists'. The fish featured on the list are from fisheries across the globe, both wild caught and aquaculture. There is no labelling initiative involved with the redlist, only the promotion of sustainable seafood choices. They have also developed a methodology to assess and review the reliability of organisations who certify fisheries as sustainable; that is currently for internal use only.

Greenpeace set 'SMART' objectives (specific, measurable, achievable, relevant and time-based) which are assessed annually up to the international level. Objectives are set for the long-, mid- and short- term for all campaigns. They are organised so that the short/mid-term goals feed into the long-term broad goal; for the marine sector the long term goal is for 40% of the oceans to be set aside as marine reserves and the other 60% to be managed sustainably; the sustainable seafood project has been developed to support these broad goals.

The seafood homepage on the international site provides a clear introduction of their intentions and goals for the public. It outlines the main problems in fisheries which have led to the need to buy sustainably sourced seafood aimed towards retailers, consumers and other stakeholders — '*if retailers and the public care about the state of our oceans these are the species that they should avoid buying'* (website). This homepage leads to several subsections: news; understanding the problem; the 'redlist'; what does sustainability mean?; testimonials; changing your business; and, glossary of terms. It also has the links to all of the national seafood websites.

The 'international seafood redlist' is available through the Greenpeace International website. Due to the fact that there is one methodology used worldwide there were no national methodologies to review (although the species included on the national lists differ depending on the market). This is one of several tools being used in the project, others include: fact-sheets, model policies, labelling guidelines, criteria for sustainable fisheries, reports, etc. All of the national Greenpeace sites provide a link to this and vice versa. On the international redlist, 20 fish species are listed with an explanation of why they have been categorised as at very high risk of being sourced from unsustainable fisheries ('red-listed') and where this information came from. If the information is dated (e.g. IUCN) then they state that there is a need for this information to be updated and the assessor must provide evidence that this is still the case. Some of the national websites have national lists which expand on the international list to reflect species on the market and cultural differences. The objective of the redlist is to provide consumers with examples of the most threatened fisheries or farmed species in Greenpeace's opinion. In order to reduce consumer confusion they decided to produce just a redlist. This allows their resources to be focussed and allow a greater amount of time to be spent on a smaller number of species. They have an

international list and as well as national lists in order to take differing seafood markets and consumer preferences for seafood into account.

Their campaign on seafood in Europe, North America and New Zealand (the campaign is not yet active in Asia — currently they are conducting a scoping project in SE Asia to develop the oceans campaign there) has been two-tiered, starting with the view that targeting the supermarkets was an avenue to reach the core of the industry: the fishermen, processors and policy makers. Their first phase of their campaign aimed to prompt the stores to develop sourcing policies on sustainable seafood. Now that the stores are interested in fisheries issues, Greenpeace have started trying to engage the stores with their broader campaign issues such as Walmart now becoming involved with the marine reserves campaign. Greenpeace do not have the facilities to act as an advisory service, but do pass on information and give details of reliable information on fisheries for people to make their own assessments. Greenpeace is well known and constantly in the public eye through demonstrations, media articles, television coverage and advertising campaigns. Activities in the oceans campaign have included: ranking supermarkets on the sustainability of their seafood sourcing and tinned tuna; sending activists in Europe to stores and head offices; protests; anti-whaling; international fish trade issues; participation at discussion forums; UK 'Seafood Seelife' campaign with chefs and food writers; attendance at RFMO meetings and other political discussions and conferences; lobbying governments; newsletters; media.

In addition to the seafood lists, there are a number of activities within the Oceans campaign. This includes supermarket league tables assessing the fisheries and aquaculture sourcing policies of supermarkets (implemented in a number of country programmes in the UK, Germany, Denmark, Spain, Portugal and Norway) as well as a 'canned tuna league table'. The canned tuna league table assesses supermarkets' own brands as well as independent brands, against their general policy to sustainability in sourcing; fishing methods used; stocks used; transparency in labelling including species used and catch method; and support for marine reserves.

4.2.2. What do they claim?

In terms of capture fisheries, Greenpeace particularly focus on providing information on destructive fishing and over exploited stocks. Fish species will appear on the seafood redlist if:

- they have a life history that makes them very vulnerable to fishing;
- they are commonly sourced from overfished and depleted stocks, or are being fished at such a high rate that stocks are being depleted rapidly;
- the fishing methods used to catch the fish are often highly destructive to other oceans creatures and/or habitats.

- Greenpeace will investigate any fishery or aquaculture species and have no limit to the number of species that can be included on the redlist. They have identified a few grey areas for them in the seafood arena: Introduced species for example, Nile perch. Greenpeace currently do not have an appropriate criteria/methodology to assess alien species effectively due to the complexity of the issue. Such fisheries are reviewed on a case-by-case basis.
- Alaskan salmon, Greenpeace are concerned about the hatchery rearing of eggs and rivers being artificially stocked but these concerns are not enough to 'redlist' the fishery. They are reviewed under both the fisheries and appropriate aquaculture criteria.
- Greenpeace do not specifically include organic criteria in their assessments but in the UK they do recommend organic farmed salmon as 'best choice' for farmed salmon (wild salmon is on their redlist). They have not analysed the organic certifiers, and assess the products using the same methodology. Having a label does not automatically mean they will pass; they still have to pass all of the criteria to prove that they do not have issues which may make them redlisted. They consider the Soil Association the best environmental scrutiny for organic certification. Exceptions are made if the aquaculture farm is able to reduce the impacts of social or environmental problems, then it will not be redlisted.

- Fuel efficiency: due to the complexity of the issue, at present they do not have the resources to include this in their seafood work but they have been involved in discussions with the fishing industry. Climate change and energy efficiency is a large part of Greenpeace's work.

Social criteria are included in the assessments of aquaculture product sustainability (see below) and the social well-being of communities is an overriding principle in Greenpeace activities.

4.2.3. How do they do it?

Greenpeace provide the following definition of sustainability on their website: '*a sustainable fishery is one whose practices can be maintained indefinitely without reducing the targeted species' ability to maintain its population at healthy levels, and without adversely impacting on other species within the ecosystem – including humans – by removing their food source, accidentally killing them, or damaging their physical environment'*.

The 'Standard'/criteria

The procedure for compiling the 'redlist' is based on answering a 'yes and no' set of criteria questions covering various aspects of fishing, whereby a 'yes' answer grades a fishery as red. There are separate sets of criteria for wild capture fisheries and aquaculture. Greenpeace do not produce a 'green' or 'yellow' category on their list.

The sustainability assessments are based on both primary and secondary information, where if primary information is available then the source documents will be used in the assessment process. Monterey Bay Aquarium Seafood Watch reports are fully referenced and clear so these are used in preference to other sources which are not found to be so well referenced e.g. Fishonline. Persons conducting the review are to seek the most relevant and up-to-date information, such sources include: Fishbase, FAO and ICES. In addition, they also receive updates directly from ICCAT, Intrafish, NGOs, RFMOs and other similar institutions. Amendments to the information that they have on their website are made upon receipt of new information and the assessments are updated at least annually. The analysis is not published on the Greenpeace website but the completed criteria are available upon request. Seafood officers in all of the national offices are able to gather information to conduct assessments which must be fully referenced.

Developing countries, small-scale producers and data-deficient fisheries

With many small-scale local fisheries the only data available are the target species and the fishing method. As long as the fishing method is not considered destructive and the species in not highly vulnerable to overfishing, these fisheries are not classified 'red' for being data-deficient. Greenpeace also recognise that they often have a lower impact than larger fisheries and are of particular importance to local communities. Part of their philosophy is to 'improve the rest', and as such they promote these fisheries to the buyers to encourage them to be fair and encourage them to support the fisheries towards providing data and improving sustainability. The philosophy of "improve the rest" (i.e. those that are not red listed) aims to promote these fisheries by encouraging the buyers to be fair and to support these fisheries towards providing data and improving their level of sustainability. A data-deficient fishery can be redlisted if the data that are available indicate 'yes' to the related criteria, for instance bottom-trawl fisheries.

Greenpeace have guidelines on what does not qualify as a sustainable fishery and will not support or promote a seafood certification scheme that has certified fisheries that Greenpeace deem as unsustainable. Originally greenpeace were collaborating with WWF, NFS and MCS to develop a joint methodology for assessment of sustainable fisheries. After many months of discussions the

organisations went in separate directions due to differences in opinion on what was acceptable in a fishery and their required outputs.

Greenpeace do not support all of the fisheries certified under the MSC programme, particularly bottom trawl fisheries or those targeting stocks assessed using MSY as the *target* for fishing level — '*Greenpeace does not currently endorse the MSC scheme because under its rules, fisheries that are still unsustainable (even though they are working to improve) can be awarded the MSC logo'*.

Assessing fisheries and aquaculture against the methodology

A fisheries sustainability review can be undertaken by anyone in the organisation. To ensure transparency, the criteria are on the website as a tool for others to use. The reviewer completes a spreadsheet giving details of references, dates, their name and all relevant information as to why the fishery passed or failed. They are open to review, debate and new information such as in New Zealand where the fisheries minister did not agree with some assessments of NZ species and submitted new data for consideration. Where necessary Greenpeace will commission external specialists if particular expertise is needed such as to develop review tools.

Greenpeace is not a certifier therefore does not undertake certain activities such as audits, accreditation, or funding fisheries.

The following assessment is based on the Greenpeace red-grade criteria for Unsustainable fisheries, Unsustainable aquaculture and their related criteria fact-sheets. Many of the aspects of the FAO guidelines were covered in the Greenpeace assessment methodology. The points were covered to varying degrees and due to the fact that there are only nine criteria for Greenpeace assessments (eight for aquaculture); many of the points were covered by the same criteria. There were a few aspects of the FAO guidelines to which no reference was made and some which were not covered because they were not relevant to NGO seafood lists.

Fisheries are defined to the species targeted (scientific name), the stock, and the fishing method used. The criteria for redlisting include: targeting highly vulnerable species; fishing in deepwater habitats; using destructive fishing methods; disregarding scientific advice; overfishing; using indiscriminate fishing methods; catching threatened or protected species; impacting entire ecosystems; and involvement with illegal, unregulated and unreported (IUU) fishing.

The criteria for an aquaculture operation include: sourcing of juveniles or eggs from the wild; introducing alien species; transfer of diseases to the wild; locating in sensitive areas; use of wild fish to feed farmed fish; human rights; general impacts on biodiversity; and unsustainable components in feed.

Fisheries

- The management system

- There is no criterion to assess whether the management system complies with relevant national and international law and regulations but it is included as a factor in their fisheries sustainability factsheet. Management aspects in the criteria centre on overfishing and IUU fishing.
- Monitoring, control and surveillance systems for ensuring compliance with the regulations are covered in the factsheet.
- Greenpeace advocates that a precautionary approach is always implemented in management and is covered in their criteria.

- Stock under consideration

- Criterion 5 asks if the stock is at a level where the population can be maintained and if scientific evidence has ever been ignored by management concerning this issue. In this way, the assessment process would never allow a stock that is overfished to be classed as sustainable.

- Ecosystem

- The assessment criteria have ecosystem and environmental groundings: vulnerable deep-water habitats; catching threatened species; and impacts on the whole ecosystem. The criteria do cover the broad problems associated with capture fisheries.

Aquaculture

- Animal health and welfare

- Health and welfare in the aquaculture criteria are covered only in one criterion which concerns disease transfer to the wild; other documentation does consider requirements for adequate stock densities and disease prevention. Issues such as the need to optimise the health of aquatic animals and the need to minimise stress is not mentioned.

- Criteria 4 and 7 cover aspects of the health of the surrounding environment and biodiversity, but aspects of the health of the culture environment are not covered. Animal welfare is not considered to be part of Greenpeace's remit; it does however feature in other documentation that they have written on aquaculture where it relates to broader environmental impacts, such as maximising health to minimise use of chemicals in disease treatment and spread.

- Aspects of drug usage and polyculture are not covered in the criteria.

- Food safety and quality

- Criterion 4 regarding the fact that the farms should not be located in sensitive areas covers whether facilities are located where the risk of contamination and pollution is minimised.

- Criteria 3 and 7 imply that the monitoring of hazards (such as microbiological) and risks is carried out in that they state monitoring be conducted as evidence to show that toxic levels are measured before and after the introduction of the aquaculture farm. These criteria also indirectly cover further FAO (draft) aspects such as a documented traceability and record-keeping system in place that includes all activities that impact food safety and that good hygiene is maintained at the site.

- The following aspects which are included in the FAO draft guidelines do not feature in any of the Greenpeace documentation: Food safety aspects (such as defined by FAO/WHO); procedures to avoid contamination of feed; and whether the broodstock do not carryover potential hazards to human health. Food safety is not a focus of this project, but it does feature within our Greenpeace campaigns such as GM and Toxics.

- Environmental integrity

- Although many of the points that were identified for the criteria with which to review the assessment processes were not covered verbatim in the Greenpeace redlist criteria, they do feature in other Greenpeace publications on aquaculture. Biodiversity and reducing impacts on the environment is a central theme in the redlist criteria.

- The criteria do not specifically mention whether environmental impact assessments were carried out prior to construction or whether environmental impacts are evaluated and mitigated, but other Greenpeace documentation does make reference to them.

- The responsible use of water and effluent management is covered in relation to discharges caused by operations in criterion 7; other documentation covers aspects of conservation of water, no waste discharge and waste management in more detail.

- Criterion 1 asks if the production system relies on wild sourcing of eggs or juveniles, and does not provide leniency as to whether this collection maybe responsible or not — it is automatically deemed unsustainable. Exceptions are made where impacts are minimal due to few specimens being removed.

- The criteria cover non-native species from aspects of genetically modified organisms and escapees into the wild.
- The use of GMO ingredients and unsustainable wild fish in feed is covered in criterion 8.
- The location of the farm outside of sensitive areas is covered in criterion 4.

- Social responsibility and resource poor producers

- Criterion 6 asks if the production system has been associated with human rights abuses and poor workers rights, briefly mentioning gender and wages. This is as far as the criteria go to assess the aquaculture system against socio-economic factors; the issues are outlined in more detail in section 7 of the factsheet on the Criteria for Sustainable Fisheries. In other documentation they have produced, socio-economic issues include child labour, supporting development in rural communities and small-scale producers, and generation issues, whether operations cause negative impacts, compliance with labour rules etc. but these are not included in the assessment criteria.

4.2.4. What are the results?

Greenpeace claim that the redlist allows consumers to avoid purchasing the most unsustainably caught/produced fish, and hence help reduce overfishing. The website states that '*Far too often consumers are left without answers when trying to find out if seafood products on their supermarket shelves have come from sustainable sources. Inadequate labelling and a lack of publically available sourcing policies have made it impossible for consumers and other market players to assess the sustainability of the seafood they buy and sell*'. They assert that the results of their campaigning and seafood sustainability scheme are for the overall benefit of a healthy marine environment. However, improving labelling is a component of the work that Greenpeace are involving the supermarkets with as they develop their seafood policies.

Greenpeace have anecdotal evidence that supermarkets, Marks and Spencer, and Waitrose, witnessed increased seafood sales after the Greenpeace campaign began. Apparently, they sell a much larger proportion of fish than their competitors compared to their overall market share.

4.2.5. Organisational costs and funding

Greenpeace does not solicit or accept funding from governments, corporations or political parties. Greenpeace states that they neither seek nor accept donations that could compromise their independence, aims, objectives or integrity. Greenpeace relies on the voluntary donations of individual supporters, and on grant support from foundations.

Total non-fundraising expenditure in 2007 for Greenpeace Worldwide was €131 million. In 2007, Greenpeace Worldwide's net income was € 156.7 million. 78% of their budget goes on campaign work, and after climate change, the oceans are the next biggest funding expense (€9.2 million in 2007). The operative budget of the consumer markets work is €150,000 in 2009. The Oak Foundation has given funds towards the Seafood Markets project which is mainly for salaries of five personnel (1 full-time and 4 part-time).

4.2.6. Comparison of country lists

Country-specific lists are available for Austria, Belgium, Canada, Czech Republic, Germany, Denmark, Netherlands, New Zealand, Norway, Portugal, Spain, U.K. and U.S.A. France and Sweden were also listed on the International website but although their national websites have seafood pages and campaigns, the red lists were unable to be located. Greenpeace indicated that France was in the process of revising its redlist and Sweden had taken the information off its website due to a shift in priorities.

A comparison of the species included on the international list was made with the lists for Spain, Germany, USA and New Zealand. In general, the lists were broadly similar, with some variations in

species to account for local availability and market demand. However, the list for Germany seemed more different from the international list than the others: it included a number of species that were not on the international list; covered 35 species compared to 20 on the international list; and also had a system of red/blue classification. A species classified as red with blue meant it should be avoided but there were better alternatives available, i.e. fisheries on that particular species that are not red graded (for these, the justification for including it as a red species was not clear); a species classified as blue with red meant it was OK, apart from specific fisheries. The difference between the German redlist and all other redlists is that all other redlists summarise fisheries on one species and red list the species if the majority of the fisheries for that species, from which the fish being sold in a particular country comes from, is red graded. In contrast, the German office lists fisheries in a section on a particular species if there are better alternatives or, if a species is generally listed as a better alternative, fisheries that are red graded are listed.

The sources of the information for the factsheets associated with the Greenpeace redlists tended to be cited as Fishonline (MCS), ICES, Monterey Bay Aquarium, Fishbase or FAO for life history characteristics, RFMOs and also specific national sources (e.g. Forest and Bird, New Zealand). A summary comparison is provided in Table 17. A full list of references used in the more detailed red-grade assessments is available from Greenpeace.

Table 17 Greenpeace summary comparison of redlists

International	Spain	USA	New Zealand	Germany
Anglerfish	Y	Y (American angler - L. americanus)	N	Y
Tuna	Y (not all spp)	Y (not all spp)	Y (not all spp)	Y* (not all spp)
Atlantic cod	Y	Y	N	Y * (also includes G. macrocephalus;
Sharks	Y	Y (Superorder selachimorpha).	Y (some different spp)	Y (not all spp).
Eel	N	N	N	Y (not all spp)
Haddock	N	N	N	Y*
Hake	Y	N	Y (not all spp)	Y
Atlantic halibut	Y	Y	N	Y (also H.platessoides, H.stenolepis)
Greenland halibut	Y	Y	N	Y
Hoki	N	Y	Y**	Y (also M. magellanicus)
Marlin	N	N	N	Y (not all spp)
European plaice	N (but does inc. American plaice)	N	N	Y
Redfish	Y	Y	N	Y
Orange roughy	N	Y	Y	Y
Atlantic salmon	Y	Y	N	Y* (also includes Oncorhynchus spp.).
Tropical shrimp	Y (not all spp, also Parapenaeus longirostris)	Y (not all spp)	Y (various species, not specified)	N
Skates and rays	Y	Y (Superorder Batoidea)	N	N
Common sole	Y	N	N	Y (also dab Limanda limanda)
Swordfish	Y	Y	Y	Y*

Patagonian toothfish	Y (not all spp)	Y (not all spp)	Y	Y (not all spp)
	Platija/American plaice			
		Atlantic sea scallop		
		Grouper		
		Ocean quahog/clam		
		Pollock		Alaskan pollock
		Red snapper	Snapper	
			Oreo/deep sea dory	
			Arrow squid	Squid/cuttlefish *
			Flounder/flatfish -	
				Gilthead seabream Aquaculture
				Wolffish
				Tilapia Aquaculture
				Nile perch
				Whiting
				Red/blue species* **
				Mussels
				European anchovy
				Saithe
				European seabass -
				Shrimps (various spp)

**Also provides alternative options*

***Mentions that 'in spite of being certified' by the MSC, this fishery has one of the severest impacts of any New Zealand fisheries*

****Better options provided, based on particular countries for aquaculture, or areas and gears for wild-caught*

4.3. Marine Conservation Society (MCS) UK

4.3.1. Background

The Marine Conservation Society (MCS) is a charitable non-government organisation that campaigns for clean seas and beaches, sustainable fisheries, protection of marine life and habitats, and the sensitive use of marine resources for future generations. Through education, community involvement and collaboration, MCS promotes individual, industry and government action to protect the marine environment.

MCS produces consumer advice through its 'Fishonline' website[123] and accompanying Pocket Good Fish Guide. MCS also produce a league table of supermarkets' seafood sourcing policies and a league table of fishing methods ranked on their selectivity and environmental impact. The fishing method league table is a summary guide only — when assessing fisheries sustainability, MCS take into account where the gear is being used, issues that are specific to the fishery and whether technological improvements have been made to mitigate any negative impacts on marine species and habitats.

MCS is very active in promoting their cause through numerous campaigns and fundraising events, including: the MCS quarterly magazine; MCS website; adopt-a-turtle programme; events such as information workshops and festivals; press releases, web videos, meetings with government agencies advocating their cause; magazine articles and books, gifts and clothing. MCS is primarily focussed on the UK (including Welsh and Scottish regional programmes), although some of the products and activities are available and relevant to all consumers globally. The information on sustainable seafood covers global fisheries that are available to UK consumers.

The MCS do not have a specific business focus, though they are aware that the information they provide is often taken account of by businesses. The MCS often works with supermarkets to improve fish sourcing policies.

4.3.2. What do they claim?

Information the MCS provide for consumers covers both wild capture fisheries and aquaculture products. The MCS rating system has been developed as a guideline for consumers who wish to choose the most environmentally responsible — in MCS's opinion — fish and seafood. The MCS only assesses ecological sustainability of seafood for its sustainable seafood programme in line with its core aims and MCS does not include economical or social sustainability aspects in its assessments.

Advocacy efforts also cover all marine resources and issues such as pollution and protection of marine wildlife. The sustainable seafood programme (of which consumer-oriented outputs are: Fishonline web resource and pocket good fish guide) promotes sustainable fisheries as being the species/stocks that consumers should purchase. When selecting a production method, it is possible to distinguish between standard and organically-certified fish farming practices as these are assessed separately. Any recommendations to consume organically farmed species are for sustainability purposes only and not health reasons (i.e. organic standards are higher with regards to environmentally sustainable production methods).

Although MCS promote the conservation of marine resources, they still advocate seafood as a healthy food option that should be utilised, but in a more sustainable way than at present. The MCS provides limited advice on health benefits and risks associated with eating any particular fish species in the 'Frequently Asked Questions' section of the website, where they detail: 'Q. What information is available on contaminants in fish?' and 'Q. What are the health benefits of eating fish?'. They also

[123] www.fishonline.org

provide links to relevant organisations regarding health issues through their Fishonline web pages in the FAQ section, including links to the Food Standards Agency's 'Eatwell' website and the Seafish '2 a week' page.

4.3.3. How do they do it?

Sustainability assessment methodology: Wild-caught fisheries

The MCS define environmental sustainability of wild fisheries through the components of their assessments. Seafood is rated on its relative environmental sustainability according to 5 components: exploitation level (i.e. under/fully/overfished); vulnerability to over-exploitation (i.e. growth rate k < 0.15, high age at maturity); appropriate and effective management; capture method (whether the method and where it is used detrimentally impacts marine species or habitat); and accreditation (if the species is certified as sustainable by the Marine Stewardship Council).

After each of the 5 sections have been scored, the data is put through a weighted model which generates a sustainability rating from the total score. Rating 1 is awarded to the most sustainably produced seafood in the opinion of MCS; ratings 2, 3 and 4 indicate that there is an increasing cause for concern, based on the information available at the time of assessment. Rating 5 is awarded to fish to be avoided on the basis that all or most of the following statements apply: vulnerable to exploitation and/or assessed by the World Conservation Union (IUCN) as threatened and/or from overfished stocks and/or stocks where data are deficient and/or from poorly managed or unregulated fisheries and/or caught using methods which are detrimental to other marine species and habitats.

Fish rated 1 or 2 comprise the 'Fish to Eat' list and only fish rated 5 are featured on the 'Fish to Avoid' list. By placing fish on the 'Fish to Eat' list, the MCS are conveying to consumers that the fish are from well-managed, sustainable stocks. The 'Fish to Avoid' list suggests that the fish are from unsustainable, overfished, vulnerable and/or badly managed fisheries, and/or with high levels of by-catch. In MCS's opinion, it is best to avoid these fish at present.

Data-deficient fisheries are assessed in their own right, and are not automatically placed on the 'Fish to Avoid' list. Within the exploitation component of wild capture assessment they can either score level 3 if they are 'completely data deficient' (an equivalent to overfished) or a level 2 if stocks are not formally assessed but do not show signs of overfishing (equivalent to ICES assessment where either fishing mortality or biomass level is above or below but near precautionary targets respectively). This means that data-deficient fisheries score poorly in the exploitation component but are still assessed for the other criteria on their own merit.

Even though the MCS do not certify wild-caught product as being sustainable, the components they base their assessment on generally reflect the FAO ecolabelling guidelines.

Sustainability assessment methodology: Aquaculture product

In relation to aquaculture practices, environmental sustainability is based on six components: siting of fish farms; sources of feed; minimising the effects of marine pollutants; 4. minimising the wider ecosystem effects; 5. optimal welfare standards and environmental management; and continuous improvement and research. The environmental criteria that MCS cover include ecosystem effects, bycatch and waste discharge (for aquaculture). They do not cover food miles or direct work on fuel efficiency, although selective fishing gears may be more fuel efficient.

Although not a certification scheme for aquaculture product, these components generally cover the main issues in the draft FAO guidelines with the notable exceptions being food safety, GMO products and social responsibilities (i.e. employee relations, community relations) of aquaculture operations.

Information sources and transparency

Fisheries assessment information used to inform MCS's sustainability advice is obtained from scientifically credible sources; however information for each individual species are not specifically referenced on each page of the Fishonline website. For details of exploitation level and management measures of wild caught species, sources include ICES (mainly for NE Atlantic stocks), all of the RFMOs, FAO, NOAA, Marine Stewardship Council, Atlantic States Marine Fisheries Commission, and Fisheries and Oceans Canada.. Information is sourced through organisations relevant to the geographical location of the fishery. Other sources include the International Union for Conservation of Nature (IUCN) assessments and fishbase.org to inform MCS advice on species characteristics/vulnerability to over exploitation. MCS also incorporate other information into assessments such as how vulnerable a species is to exploitation and whether it is listed by international organisations such as IUCN or OSPAR as threatened. For aquaculture species, the Global Aquaculture Alliance is a source used for information.

Independent third party certification is also taken into account in the MCS assessments. Under the 'accreditation' component the sustainability assessments, MCS currently only recognise Marine Stewardship Council certification, together with organic certifiers such as Soil Association and Organic Food Federation. However, such certified fisheries or farmed fish do not automatically receive a 'Fish to Eat' listing, but have to undergo a full MCS assessment and may score a different rating.

For aquaculture species, information sources include but are not limited to: Industry Codes of Practice, FAO Aquaculture factsheets, European Commission information portal; scientific reference papers; Producer Organisations; and Industry Production Standards.

Information on the Fishonline website is reviewed and updated when new advice and information become available. MCS are open to new information; if new evidence on the status of a stock is published or a fishery becomes certified by a sustainability scheme (such as MSC) then they would adjust sustainability ratings for that species.

To incorporate stakeholder comments when determining sustainability, MCS has begun work with the Sea Fish Industry Authority to create an 'information review group' which can preview relevant assessment scores and provide appropriate information that may not have been previously available to MCS, and may influence these ratings assessments.

The MCS website[124] includes all media articles relating to MCS. Some of these media releases include information from fishing industry groups questioning the reliability of stock assessments and hence the sustainability advice given to consumers. The MCS also has an application on Google Earth™ that places the 'Fish to Eat' stocks (does not include fish to avoid) on a map indicating where the fish are caught.

Other responsibilities

The MCS believe that they abide by the spirit of all relevant national and international laws, regulations, agreements and protocols, however they are yet to complete a full quality audit of their work against these guidelines, including the FAO ecolabelling guidelines. MCS have stated that they are likely to carry this out in the near future.

Within the MCS fisheries policy they state that 'MCS would like to see implemented the protection of artisanal fisheries from the impacts of industrial fishing and Third Country Agreements including the development of "Fair Trade" fish products and a ban on "Super trawlers" in these waters'. In addition they have a separate score for data-deficient fisheries in the exploitation component of wild capture assessment of fisheries in developing countries.

[124] www.mcsuk.org

To enable consumers to relate products in the shops/restaurants to information on Fishonline and the pocket guide, the MCS highlights consumer-orientated certification labels such as the MSC tick logo, Soil Association logo and dolphin friendly logo. They provide stock- and capture-specific information (e.g. line-caught haddock from NE Arctic) to enable consumers to make an informed choice. MCS also are currently working with supermakets to improve the level of detail given to consumers on product packaging and are encouraging consumers to ask the retailer or restaurant where the fish has been sourced if the information is not freely available.

4.3.4. What are the results?

The fisheries consumer advice programme is a leveraged campaign that seeks to create greater environmental sustainability in the way society uses the oceans fishery resources. Results can be measured at several levels. Firstly the number of consumers who carry the sustainable seafood wallet card, or access the Fishonline website give an indication of the interest amongst the general public in buying sustainable seafood. Secondly, the reaction of the leading supermarket chains, who have tightened their procurement procedures in relation to wild-caught and farmed fish, is a major result and is evidenced by fish stocking policies being increasingly outlined in corporate and sustainability reports. Thirdly, the need for supermarkets to procure more sustainably-caught seafood will drive improvements in government and European fisheries policy, as well as improvements in the way the catching sector operate. Accordingly, MCS have added a fisheries policy officer to the MCS team so as to maximise this opportunity. The monitoring of performance is the responsibility of the MCS Board of Trustees.

The MCS's industry partners have informed them that products with a good MCS rating do not command higher price. Instead retailers compete by showing improved environmental credentials overall.

Due to the similar acronyms and field of work, the MCS and MSC can be confused by consumers and the press. MCS explains the work of the MSC through Fishonline and the Pocket Good Fish Guide, and work closely with the MSC on this issue.

4.3.5. Organisational costs and funding

MCS is a registered charity that derives its funding from several sources including the general public through donations and subscriptions, and also from corporate sponsorship, from charitable trusts and foundations and from grant-giving bodies. Total income to the charity in the year ended March 2008 was £ 1.2 million (€ 1.3 million[125]), which is expected to rise by about 20 % for the year ended March 2009.

Roughly 85 % of this income is used to support conservation work. The span of MCS's conservation work includes not just fisheries, but also biodiversity projects including species protection as well as marine reserves, work on litter at sea, on coastal pollution from sewage, on both national and European legislation and also specific Scottish and Welsh programmes. Full details are given in the MCS strategy 'Seas Fit For Life', and a summary of each year's progress is published in the annual report and accounts. Both can be made available upon request.

Fisheries issues are a key part of the conservation portfolio, and in the financial year 08/09 £ 120,000 (€ 135,000) was spent on this programme (10 % of the total income). Roughly half of this sum was spent on compiling fisheries and stock sustainability information, with the remainder of the funds being directed towards fisheries policy development and mariculture work.

[125] Exchange rate of £1:€1.11, 28 April, 2009.

The information MCS provide on Fishonline is freely available to anyone with access to the internet and they will also print and send relevant information to consumers without internet access if requested), the pocket Good Fish Guide is also available free. The use of their logo is restricted to certain key partners in accordance with the terms and spirit of the Charities Act.

4.4. Monterey Bay Aquarium — Seafood Watch

4.4.1. Background

Seafood Watch[126] is a programme of the Monterey Bay Aquarium[127] (MBA). Seafood Watch's mission is to empower consumers and businesses to make choices for healthy oceans. It is designed to raise consumer awareness about the importance of buying seafood from sustainable sources. MBA promotes sustainable fisheries and aquaculture worldwide and responsible seafood consumption. Seafood Watch recommends which seafood to buy or avoid, helping consumers to become advocates for environmentally-friendly seafood. It focuses on seafood consumed in the US, but covers seafood sourced internationally. The audience is mainly the US, although Seafood Watch has partner organisations throughout North America and individuals and scientists worldwide use their recommendations. Seafood Watch are also partners of the Seafood Choices Alliance where, along with other seafood awareness campaigns, they provide seafood purveyors with recommendations on seafood choices.

Seafood Watch provides seafood recommendations to a variety of audiences including consumers, food service professionals, major seafood buyers and the seafood industry. The Seafood Watch programme communicates to its audience through the aquarium and its partners, and through print and online communications. Seafood Watch has staff and online resources dedicated to active marketing and communications, and works with partners (national and international) to bring the message to their regions. A number of other organisations (in particular NGOs) also use the Seafood Watch information and recommendations to inform their own sustainability assessments.

Seafood Watch explains its purpose through its website, which has a complete and transparent overview of the issues and scientific criteria for wild-caught and farmed seafood, and additional information for how consumers and businesses can become involved. Communications are available with technical content appropriate for the lay person up through the professional scientist or conservationist. Seafood Watch focuses on consumers, distributors, restaurants, food service, major seafood buyers, retailers, and other businesses including regional and national distributors and producers of seafood. It also helps inform other NGOs, media, governments and the fishing industry.

4.4.2. What do they claim?

The Seafood Watch programme is designed to apply to any commercial wild-caught and aquaculture species, but does not evaluate recreational or subsistence fisheries. The programme is not limited to specific species, and adds new species as appropriate. The programme currently covers over 50 species.

The program does not issue an ecolabel, but rather makes recommendations on a green-yellow-red scale of sustainability, using standards developed by the program. Although Seafood Watch does not provide a label, some establishments use placards stating that the establishment follows Seafood Watch recommendations.

Seafood Watch consulted with independent scientists in the development of the assessment methodology. They focus on ecological sustainability, and do not address social criteria or organic products. For wild fisheries, ecological issues include inherent vulnerability, stock status, bycatch, habitat/ecosystem, and management. Ecological issues for aquaculture include use of marine resources, disease transfer, escapes, pollution/habitat, and management. Within these broad criteria are many factors. Food miles and fuel efficiency are not currently included. The program uses health recommendations from Environmental Defense Fund[128]. The programme does not explicitly cover social

[126] http://www.montereybayaquarium.org/cr/seafoodwatch.aspx
[127] http://www.montereybayaquarium.org/
[128] http://www.edf.org

criteria, though several social considerations are implicit in the criteria, including the section on management. The management section further considers compliance with national and international laws. The programme provides a range of information for business. It partners with restaurants, food service providers, suppliers and producers nationally and internationally, and makes information available to major seafood buyers (e.g. large foodservice companies), retailers, broadline distributors and specialty houses. The Seafood Watch website has links to partners and has a website section specifically for restaurants.

Many aspects of the Seafood Watch programme are consistent with elements of various international guidelines. However, the programme was not designed to meet any one scheme. It provides a comprehensive, integrated structure reflecting the interdependence on many ecological and anthropogenic roles and influences that need to be factored in to statements on the sustainable nature of wild fisheries or aquaculture products. Seafood Watch does not issue certifications and is not accredited to certify.

4.4.3. How do they do it?

The Seafood watch program defines sustainability as 'maintain or increase production in the long-term without jeopardizing the structure or function of affected ecosystems', and adds that 'seafood from sources, either fished or farmed, that can exist over the long-term without compromising species' survival or the health of the surrounding ecosystem is sustainable'.

Seafood Watch staff prepare in-depth assessments of the species in question and often separate advice by area and gear, which may get different recommendations. The guidelines for evaluating the various criteria are clearly laid out on the website[129]. Original criteria, used to assess the sustainable nature of wild fisheries or aquaculture operations, were created working with a panel of academic and NGO experts.

Seafood Watch has a set of guiding principles that capture fisheries must meet to be considered sustainable by the programme. Species from sustainable capture fisheries:

- have a low vulnerability to fishing pressure, and hence a low probability of being overfished, because of their inherent life history characteristics;
- have stock structure and abundance sufficient to maintain or enhance long-term fishery productivity;
- are captured using techniques that minimise the catch of unwanted and/or unmarketable species;
- are captured in ways that maintain natural functional relationships among species in the ecosystem, conserve the diversity and productivity of the surrounding ecosystem, and do not result in irreversible ecosystem state changes; and
- have a management regime that implements and enforces all local, national and international laws and utilises a precautionary approach to ensure the long-term productivity of the resource and integrity of the ecosystem.

The specific criteria for capture fisheries are:

1. Inherent vulnerability to fishing pressure;
2. Status of wild stocks;
3. Nature and extent of discarded bycatch;
4. Effect of fishing practices on habitats and ecosystems; and
5. Effectiveness of management regime.

Each criterion has a number of specific factors to evaluate associated with it.

[129] http://www.montereybayaquarium.org/cr/cr_seafoodwatch/content/media/MBA_SeafoodWatch_RecommendationProcess.pdf

Seafood Watch has a set of guiding principles that aquaculture operations must possess to be considered sustainable by the Seafood Watch program. Sustainable aquaculture:

- uses less wild caught fish (in the form of fish meal and fish oil) than it produces in the form of edible marine fish protein, and thus provides net protein gains for society;
- does not pose a substantial risk of deleterious effects on wild fish stocks through the escape of farmed fish;
- does not pose a substantial risk of deleterious effects on wild fish stocks through the amplification, retransmission or introduction of disease or parasites;
- employs methods to treat and reduce the discharge of organic waste and other potential contaminants so that the resulting discharge does not adversely affect the surrounding ecosystem; and
- implements and enforces all local, national and international laws and customs and utilizes a precautionary approach (which favors conservation of the environment in the face of irreversible environmental risks) for daily operations and industry expansion.

The specific criteria are:

1. Use of marine resources;
2. Risk of escaped fish to wild stocks;
3. Risk of disease and parasite transfer to wild stocks;
4. Risk of pollution and habitat impacts; and
5. Effectiveness of the management regime.

Again, each criterion has a number of specific factors associated with it against which the aquaculture operations are assessed.

Seafood Watch uses all available data sources, including traditional knowledge, provided there is a means for independent verification. All of the Seafood Watch reports that are used to generate the recommendations that are the basis of the programme follow an academic, peer-reviewed structure. The guidelines and criteria for evaluating fisheries, combined with internal and peer review, assure all appropriate issues are addressed. The results are documented in seafood reports for each recommendation, generally ranging from 20–100 pages. In many cases industry, NGO, and government outside experts are consulted on a species-by-species basis to ensure transparency, relevant information, and broad participation of various interests. The Programme uses reports from management authorities (e.g., national management agencies, regional fishery management organisations), primary literature, progress and technical reports (grey literature), news articles, and personal communications. The most recent information may come from the date of publication to several years earlier. For example, the Patagonian toothfish report, dated November 2006, has articles from 2004 and earlier. In this report, Seafood Watch recommended avoiding Patagonian toothfish, but recognised the MSC certification of the South Georgia and South Sandwich Islands toothfish fishery and recommended that consumers buy only MSC-certified toothfish. The report for Atlantic bluefin tuna was completed in July, 2004, and uses articles from 2004 and earlier. The report on swai and basa (imported river cat fish), from December 2008 uses articles from 2004 and earlier. The report mentions that few science articles are available, and that most deal with nutritional needs and husbandry. The programme takes into account any new information that is provided by credible sources after a document is published, and updates the report as appropriate. A full reference list is provided for each recommendation in detailed reports, some of which are available online and all are publicly available.

The staff convert the information from the assessment into a ‘pocket guide’ with colour coded advice, but no details. The information on the cards is updated continuously online and every six months in print. Full assessments are updated every few years. Seafood Watch has an extensive webpage. The

recommendations or assessments do not directly address traceability but indicate IUU problems that may occur (e.g. Patagonian toothfish).

The programme does not aspire to meet international criteria (e.g., ISO, CAC and WTO principles), but generally follows academic guidelines for the publication of peer reviewed documents to assure credibility and transparency The programme assures scientific credibility with permanent staff including the Senior Science Manager, Fishery Research Manager, and Aquaculture Research Manager. All seafood reports are peer reviewed by at least two experts. Industry experts and government officials are also consulted throughout the process.

Seafood Watch recognises the Marine Stewardship Council (MSC) and Environmental Defense Fund. On fisheries to date, fisheries with MSC certification receive at least a Seafood Watch Good Alternative recommendation. The programme also has equivalencies with the Environmental Defense Fund purchasing standards for farmed salmon and shrimp.

The programme can deal with data-deficient fisheries. The criteria use a tiered system designed to deal with various levels of information, and is precautionary when data are not available by pointing out missing information, and downgrading ratings in the absence of information. Many assessments have occurred with missing data.

The organisation undertakes considerable outreach, and partners with a number of organisations and businesses to bring the message to their visitors and customers. Seafood Watch has a communications strategy that incorporates live presentations as well as print and online approaches (web, social marketing, mobile technology, etc).

All seafood reports are sent out for peer review by independent experts, and anyone is free to comment on or contest their reports. In each case Seafood Watch staff consider the new information and include it in the reports if it is credible and relevant. For example, the programme recently added additional information to the cobia report after sharing an initial draft with industry. The programme receives new information through NOAA quarterly stock updates, partnerships with multiple organisations and industry representatives, and periodic updating of all seafood reports, which are the basis for all recommendations.

Pocket guides are updated every six months. Online information is updated in real time. The programme is moving toward a protocol of updating all reports at least every three years, and more frequently for high priority (high volume) species. Recommendations can be carried in hard copy or online. Seafood Watch recommends that, if consumers cannot access the information they need to determine if a species is a Best Choice or Good Alternative, they share the issues with the retailer/restaurant and choose something else.

The Seafood Watch is not a certification program, but the wild-capture evaluation criteria do explicitly consider the management system and precautionary management, the status of the stock and need for rebuilding, and ecosystem health and impact of the fishery, in line with FAO guidelines. The aquaculture criteria explicitly consider environmental integrity of the operation, and animal health and welfare is covered to some extent under management regime, but they do not consider food safety and quality, or social responsibility, which are components of the draft FAO aquaculture certification guidelines.

4.4.4. What are the results?

Seafood Watch claims environmental benefits through recommendations to avoid unsustainable seafood products; red-listed fisheries may have environmental as well as stock status issues. The criteria are geared towards a seafood industry that maintains the oceans as wild, complete ecosystems. Although the claims have not been independently verified, Seafood Watch is widely acknowledged to have robust standards geared towards protecting the environment.

The rating system may have economic benefits, but they have not been evaluated. Anecdotal information suggests that sustainable seafood may be considered value-added and sell for a higher price or gain access to upscale markets, or red-listed seafood may see fewer sales. Restaurants and retailers are finding that sustainability is a marketing point and this is now trickling up the supply chain.

Seafood Watch is working to reduce confusion with other pocket guide systems by coordinating with Blue Ocean Institute, Environmental Defense Fund, and SeaChoice to ensure consistency among recent Sushi Guides. Seafood Watch has partnerships with many organisations to ensure consistency. Seafood Watch has formal agreements with a number of other NGOs that use Seafood Watch rankings to ensure consistency. The programme is currently working with Blue Ocean Institute to alleviate confusion. These efforts are also ongoing through the Conservation Alliance for Seafood Solutions[130].

4.4.5. Organisational costs and funding

Currently, information is provided at no cost. Reimbursement may be requested for large amounts of materials, travel by Seafood Watch staff, etc. The website has an opportunity for readers to contribute. As an NGO with extensive fundraising, the Monterey Bay Aquarium receives funds from foundations, private contributions, entry fees to the aquarium, corporations, and partners. The annual budget for Seafood Watch is US$1 million.

[130] http://www.solutionsforseafood.org

4.5. NOAA Fisheries FishWatch

4.5.1. Background

FishWatch US Seafood Facts[131] provides information to help the consumer identify the status of fishery stocks and understand the management and science requirements involved with building and maintaining sustainable fisheries. It is run by the National Marine Fisheries Service (NMFS) — the US authority on marine fisheries science, conservation, and management. NMFS conserves, protects, and manages living marine resources in a way that ensures their continuation as functioning components of marine ecosystems, affords economic opportunities, and enhances the quality of life for the American public. The FishWatch programme is a small component of the overall responsibilities of NMFS.

A critical element of NMFS' mission is to make fisheries data and information available to all its audiences, including seafood consumers. FishWatch provides consumers with relevant, factual data to assist with decisions about sustainable marine seafood (i.e. excluding exclusively freshwater seafood). FishWatch covers approximately 100 species. The data are taken from a variety of NOAA sources, including stock assessments, fisheries surveys, fisheries management plans and amendments, environmental analyses, and cooperative research. The sources were selected to ensure that the information on FishWatch is the most timely and accurate information available on US fisheries. As a result, only fisheries in US waters are included — fisheries in other regions of the world, and hence imported species, are not covered.

NMFS does not provide standards or recommend which fish to purchase or avoid. Sustainability is based on the 10 National Standards required in the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the enabling legislation for US Federal fisheries.

4.5.2. What do they claim?

FishWatch focuses on wild capture species. While FishWatch does not profile aquaculture species, it does include information on aquaculture species and whether wild capture species are also produced in aquaculture. They do not make recommendations on fish to select or avoid, but provide information from which a consumer can make a decision. The website states it presents 'US seafood facts.' The focus is on ecological sustainability, and the information presented does not address social criteria or organic production methods. Environment factors covered include ecosystem and bycatch factors. The FishWatch programme does not provide a label for products. As the FishWatch programme does not certify or recommend fish, it does not attempt to comply with the FAO guidelines. However, the criteria that they assess (stock status and characteristics, science and management, and ecosystem interactions) cover the main requirements of the FAO ecolabelling guidelines.

The website has an extensive section on health benefits and risks from eating seafood – Seafood and your Health[132]. This section covers general information on shopping for seafood, safety issues with catching your own fish, storing fish, cooking and serving fish, important health notes, mothers and mothers to be, and nutrition. In addition, the section for each species provides specific nutrition information for that species (calories, fat, carbohydrate, cholesterol, selenium, and protein per serving).

4.5.3. How do they do it?

NMFS is the primary science and management agency for seafood resources in the US. As such, it undertakes research and implements management actions. NMFS conducts stock assessments and prepares management plans with the Regional Fishery Management Councils. All work is publicly available and peer reviewed. Through its website and those of the Regional Fishery Management

[131] http://www.nmfs.noaa.gov/fishwatch/
[132] http://www.nmfs.noaa.gov/fishwatch/seafood_and_health.htm

Councils, NMFS makes information publicly available and takes public comments through extensive stakeholder participation. NMFS considers that seafood is sustainable when the population of that species of fish is managed in a way that provides for today's needs without damaging the ability of the species to reproduce and be abundant for future generations. Specifically, all fisheries must meet the 10 national standards for conservation and sustainable management set by Congress in the MSA. The assessments take into account traditional knowledge by virtue of fishery management plans and fish stock assessments considering fishing communities.

The national standards are as follows:

(1) Prevent overfishing while achieving optimum yield.
(2) Be based upon the best scientific information available.
(3) Manage individual stocks as a unit throughout their range, to the extent practicable; interrelated stocks shall be managed as a unit or in close coordination.
(4) Not discriminate between residents of different states; any allocation of privileges must be fair and equitable.
(5) Where practicable, promote efficiency, except that no such measure shall have economic allocation as its sole purpose.
(6) Take into account and allow for variations among and contingencies in fisheries, fishery resources, and catches.
(7) Minimise costs and avoid duplications, where practicable.
(8) Take into account the importance of fishery resources to fishing communities to provide for the sustained participation of, and minimise adverse impacts to, such communities (consistent with conservation requirements).
(9) Minimise bycatch or mortality from bycatch.
(10) Promote safety of human life at sea.

FishWatch is a compilation and summary of information necessary for the management process; the species pages link back to more details. Information brought forward to FishWatch is taken from a variety of NOAA sources, including stock assessments, fisheries surveys, fisheries management plans and amendments, environmental analyses, and cooperative research. The management programmes and research conducted by the Regional Councils and NMFS are public information and involve extensive public input. The programmes that generate the primary documents, policies, and decisions are active in seeking stakeholder input. However, the FishWatch programme, as a summary of available information, does not explicitly seek and use public comments. NMFS has many species under federal management, and lacks the resources to conduct adequate stock assessments for all species. Some species have no assessments, some have inadequate assessments, some have adequate assessments but not updated in a timely way, and a few species have regular updates.

4.5.4. What are the results?

FishWatch provides information for free as it is a government site. Benefits accrue from consumers obtaining information with which to make decisions on seafood consumption. Extensive links to management plans, stock assessments, and other relevant information exist. The expected result is that consumers will be better informed and able to make informed purchasing decisions. The scheme does not have social, economic, or price benefits. The site does not claim any specific benefit other than informing consumers.

4.5.5. Organisational costs and funding

The FishWatch budget comes from NMFS (i.e. government-funded). The specific budget amount is not available. The overall NMFS budget is of the order of US$ 900 million.

4.6. The North Sea Foundation: Goede VIS

4.6.1. Background

The North Sea Foundation (NSF) is an independent Dutch nature conservation and environmental protection interest group with a vision to 'restore the health and productivity of the North Sea'. *Goede VIS* ('Good FISH') is a campaign by NSF. It constitutes a core activity of the organisation and aims to provide consumers and companies in the supply chain with information on the sustainability of fish.

The Goede VIS programme has the following objectives: (i) increasing awareness among consumers about the impact of fisheries and aquaculture on the marine ecosystem; (ii) stimulating consumers to change their buying behaviour; (iii) increasing recognition by consumers of certified seafood and encouraging them to buy certified seafood; (iv) catalysing action among companies in the supply chain to source sustainable seafood and among fisheries to change towards more sustainable practices; and (v) increasing the share of certified seafood in the total supply.

Goede VIS has a specific focus on fish commercially available to consumers in the Netherlands, irrespective of its geographic origin or production method.

The NSF was originally part of the collaboration efforts between MCS UK, WWF and Greenpeace to produce a single methodology for assessing whether a fishery could be categorised as sustainable. Following many months of discussions, it became apparent that one methodology would not be possible due to differences in objectives between the organisations. WWF and NSF remained partners in the development of their methodologies, while MCS and Greenpeace went on to develop their own. WWF and NSF work closely when conducting assessments and often cross-check assessments.

4.6.2. What do they claim?

Goede VIS claims to provide advice regarding the sustainability of the seafood available on the Dutch market based on the sustainability assessments they carry out. They independently assess the sustainability of non-certified seafood[133] available on the Dutch market, in order to increase awareness and enable consumers and companies in the supply chain to choose more sustainable seafood. As such, Goede VIS aims to influence the market. They cover both capture fisheries and aquaculture and cover all species of fish from all sources.

Their criteria are only environment and sustainability focused, albeit that there is no explicit definition of sustainability or explicit justification in a sustainability context of the benchmarks used. The website is self-endorsing: sustainable fish is that which has been assessed by them as sustainable. Goede VIS states that sustainability is defined by the issues incorporated in the methodologies for assessment, which are not made public to avoid 'an uncontrolled situation where parties are doing assessments and claiming scores 'along the methodology of the VISwijzer[134]'.

An independent research institute performed various assessments using the Goede VIS methodology. Their results are said to be 'in line with Goede VIS assessments'. Also, in 2007, the assessment methodologies were subjected to an external scientific review, followed by a public stakeholder comment period. However, neither review was available for consideration by this review.

Goede VIS stresses that it is not an independent certification body. It sees its role currently as providing advice on sustainability while the certification of seafood in the Dutch market develops. They do not assess the sustainability of seafood certified by other schemes. They do not label products.

[133] To avoid confusion between Goede VIS sustainability assessments and fish certification schemes.
[134] The '*VISwijzer*' is the online and printed version of the fish sustainability advice.

4.6.3. How do they do it?

The Goede VIS information is primarily communicated through their website[135]. The website provides the outcomes of all the assessments and limited information about the methodology, partners and other background information.
Other tools and services are also used for specific target groups, e.g. a wallet card for the general public and a printed version of the Goede VIS guide. Customised advice is provided to retailers regarding their seafood range and a workshop for fishmongers introducing the topic of sustainable seafood was organised.

Assessments are based on existing information from a range of sources, including certification schemes such as MSC. NSF state that they use the most recent publicly-available, preferably scientific information in updating assessments. The results of their assessments are summarised and published but the data used and their analysis as such are not available for scrutiny.

Separate sustainability assessment methodologies[136] have been developed together with WWF and other partners for capture fisheries and cultured species. They are based on a questionnaire addressing specific sustainability issues. The main criteria used in the sustainability assessments include for capture fisheries: (i) intrinsic biological characteristics of species and stock status; (ii) the ecological effects of the fishing activity; (iii) management of the particular fishery. For aquaculture, the main issues considered are (i) the production system (and siting) and effects on the ecosystem; (ii) feed; (iii) ecological effects of the production system (water, energy) and location; and (iv) management. The scoring system varies between questions, ranging from a possible 0 to –2 score for some, to 3 to –4 score for other questions.

The assessment work is done by NSF together with a limited group of approved assessors in order to ensure consistency in the assessments. Cross-checking assessments within this team minimises subjectivity.

The assessment process has been open for public consultation to some extent but the outcome of the assessments is simply presented, not put forward for consultation, review or debate. The quality of the source data is not clear and where information is lacking, the opinion of the organisation is put forward instead. Important aspects such as social issues and transport costs are not considered. Assessments focus on species and therefore are unlikely to reflect stocks or natural populations, albeit that these at times are disaggregated by region of origin. Wild catch species are defined by (i) origin/stock, (ii) capture method and (iii) management regime. Farmed species are defined by (i) land of origin, (ii) aquaculture method and (iii) public requirements regarding management. Farmed species are not evaluated at farm level.

The outcome of the assessments is provided as purchasing advice to consumers and distributors using a colour-coded system classifying the fish as excellent choice (green), second choice (amber), rather not (red), un-assessed because of lack of information, or MSC certified. The scores obtained from the assessment against the criteria are then converted into the green, amber and red classifications for the wallet guide (further split into light green and dark green, and light red and dark red on the website), based on predefined scores. However, no information was available on how the scores for each classification had been determined.

Goede VIS is ambiguous in setting standards for their sustainability assessments. They claim that the need to ensure transparency, avoiding conflicts of interest and allowing for participation by all interested parties does not apply to their standard setting procedures since they are not a independent

[135] www.goedevis.nl
[136] The methodology questionnaires have been made available for this review but they are not normally shared with the public.

certification scheme. The species assessment process is not open to public consultation, but an industry consultation is part of the process.

Assessments are updated regularly, preferably annually (depending on funds available).

4.6.4. What are the results?

The results of the scheme are unclear, and claims to its effect are largely absent or not quantified. Since Goede VIS aim to develop a market for sustainable seafood, its market-orientated approach has led to increased cooperation with North Sea fisheries to improve their practices in order to become more sustainable. NSF is one of the principal generators of Dutch media attention to sustainable seafood.

No immediate economic or social benefits are claimed by Goede VIS. There is no information on premium prices for recommended products but it is unlikely there are any merely because of the qualification of a product.

Goede VIS has not taken specific action to alleviate consumer confusion between their scheme and others. They acknowledge an increase in the number of true and false or vague sustainability claims on seafood products in the past five years, and claim some credit for generating this. Goede VIS acknowledges further that potentially it could be contributing to further confusion. Therefore, NSF always emphasises that they are providing advice, not independent seafood certification. Nonetheless, it is unlikely that this distinction will be appreciated by the (confused) consumer.

4.6.5. Organisational costs and funding

Use of the scheme is free for the producers and consumer alike, and the use of the scheme's products (logo etc) is facilitated. No costs or charges are incurred in using the services provided by the organisation but as of late 2008 Goede VIS is exploring a modest contribution (member ship fee) by e.g. major retailers who benefit from the Goede VIS scheme.

North Sea Foundation is funded by several Dutch government agencies as well as charities, and donations from individual supporters. Funds for the Goede VIS have been received from various sources (e.g. Ministry of Environment, Stichting DOEN, VSB, OAK Charity and WWF Netherlands). The current budget of Goede VIS is about € 90,000 per year. An expansion of Goede VIS depends on availability of funds.

About 10% of the staff budget (1.2 full-time equivalent positions) of the North Sea Foundation are allocated to Goede VIS.

4.7. Sustainable Fisheries Partnership

4.7.1. Background

The Sustainable Fisheries Partnership (SFP) was founded in 2006 as an independent, global, non-governmental organisation (NGO). It was established as a nonprofit project under the Trust for Conservation Innovation, registered in California, USA. SFP provides strategic and technical guidance to seafood suppliers and producers, helps form linkages between like-minded companies to promote improvements in fisheries, and builds consensus around specific improvements in policies, marine conservation measures, and fishing and fish-farming practices.

SFP claims that "*many important fisheries are not yet managed well enough to meet the standards of the Marine Stewardship Council (MSC) or other international arbiters of sustainability. This puts many major seafood buyers and producers in a bind: they need the products of these fisheries, but they are committed to sustainability in their sourcing. That's where SFP comes in. Sustainable Fisheries Partnership fills a critical gap by helping less well-managed fisheries meet the environmental requirements of major markets — and by utilizing the power of the private-sector to get the job done*".

4.7.2. What do they claim?

SFP aims to build the private sector's capacity to make a difference in two ways: by developing business practices and alliances that support sustainable sourcing of seafood; and by advocating stronger government fisheries and marine conservation policies. SFP develops and manages Fishery Improvement Partnerships, which are alliances of buyers, suppliers and producers that work together to improve a fishery by pressing for better policies and management while voluntarily changing purchasing and fishing practices to reduce problems such as illegal fishing, bycatch and habitat impacts. This kind of incentive and mechanism for improvement of fisheries is important for 'transitional' fisheries that may not yet pass a full ecolabel certification, but are working towards improving management and the state of the fishery. The SFP covers both aquaculture and wild capture fisheries. Aquaculture projects include work on tilapia in Thailand, Indonesia and China, and catfish in Vietnam.

SFP have developed FishSource, an online resource available to the public that consolidates and summarises the main scientific and technical information needed by seafood buyers to evaluate the sustainability of fisheries. FishSource is directed at seafood businesses in order to help them source sustainable product, and not the individual consumer. FishSource currently only covers wild-caught fish stocks, but there are plans to include aquaculture products in the future.

4.7.3. How do they do it?

Through FishSource, the SFP gathers publicly-available data to evaluate relevant fish stocks and management systems. They provide general information on the fishery, the management quality of the fishery, stock status, adequacy of stock assessments, the history of the fishery and much more. The information provided is very detailed and referenced from reliable sources. The scheme currently provides information for 120 fisheries around the world; however, many of the categories of information are still under development for a number of fisheries.

The SFP does not specifically define sustainability through FishSource. They define the areas people are measuring when they evaluate sustainability, but don't define a level above which is 'sustainable' — they leave it to the users of the FishSource data to do that themselves, according to whichever standard of definition of sustainability they are using. FishSource describe themselves as being "*like a thermometer — it [we] reports a reading, but leaves it up to the user to determine whether its 'too hot, too cold, or just right'*".

Information on FishSource is updated regularly with data from consultants, government agency reports, and updates or extracts from existing fishery evaluations by NGOs to major retailers and fish buyers. Updating information for many fisheries depends on when stock assessment data is released by the relevant body e.g. ICES reports are released in April each year. The SFP's aim is that all the information on FishSource will ultimately come from the foremost experts in each fishery and be rated and commented on openly and transparently by visitors to FishSource. The SFP has a Scientific Advisory Board (SAB) that has oversight of the integrity of information being placed on the FishSource website. Registered users can contact the SFP with claims of being an expert in a certain fishery. If their credentials are considered sufficient, the information they provide can be approved by the SAB. The website provides a review section for each fishery so stakeholder comments can be made and if appropriate, incorporated.

FishSource is also currently supporting SFP's Metrics System. This system uses information on fisheries from FishSource to help generate scorecards that enables retailers to measure their progress in sustainable sourcing. The web-based application provides the ability for suppliers to enter volume information on product supplied to any company on a weekly basis and to provide buyers and managers with a simple, easy-to-read view of the information provided by suppliers, allowing them to benchmark the sustainability implications of their purchases. For example, a buyer will be able to see the sustainability information for all of the species they are purchasing from sellers, and in turn assess future purchases against their own sustainable seafood sourcing policy.

The aquaculture component of FishSource is still under development, but it will adhere to the same basic principles as the rest of FishSource — it will use only publicly-available information, and not define sustainability itself, but instead report on basic metrics. The SFP is not yet sure what format the aquaculture component will take, but it will enable users to search from a particular species group (i.e., tilapia or shrimp) down through countries and growing areas, to individual farms. The SFP is hoping to capture whatever information they can on individual farms that are held and reported publicly by governments, and capture what other public information is available from news reports etc. Most of the information at the farm level is privately-owned by the farm (i.e., results of audits), and the SFP is working on ways that farms can make that information available to certain customers through FishSource or another on-line system that Metrics can tap in to (i.e. any farm that wishes to communicate details to a customer could theoretically give permission to SFP to report some of the audit results to a particular customer, but this is very much in the development stage).

The FishSource website is currently not easy to find on the SFP website, and should be promoted more prominently as it is an excellent source of information.

FishSource is actively promoted through trade shows, an updated newsletter and fact sheets for major SFP issues.

4.7.4. What are the results?

The SFP suggest that the benefits help companies and other stakeholders advocate for appropriate regulation of fisheries and fish farms, choose their sources wisely, and meet their own sustainability commitments. FishSource does not involve a labelling scheme and there is no evidence of improved profits for companies that have engaged with SFP. The benefits that arise from SFP activities are more long-term and industry-wide.

FishSource aims to inform buyer behaviour, which in turn aims to influence supplier behaviour and encourage improvement projects. Therefore, effectiveness is measured at three levels: (1) are big buyers using FishSource in their sourcing decisions? (at present, McDonald's, Walmart and Foodvest are major buyers confirmed using FishSource, many others are testing it); (2) are these buyers engaging their supply chains in improvement projects (yes, in the case of McDonald's, Walmart and Foodvest);

and (3) are improvements happening (are policies and practices changing?) and are they delivering results 'in the water' such as increases in biomass, or reductions in bycatch (results of this were not yet available). The SFP reports the progress of improvement projects on their website, in their newsletter, and are developing a more sophisticated monitoring system that will be searchable on-line.

4.7.5. Organisational costs and funding

SFP is a non-profit project that is fiscally sponsored and legally organised under the Trust for Conservation Innovation. Principal funding for FIshSource is from the David and Lucile Packard Foundation (under the fiscal sponsorship of Trust for Conservation Innovation, which acts as a business incubator for NGOs). SFP has also received corporate sponsorship from McDonald's, FoodVest and other companies.

FishSource currently takes up 15% of the SFP total budget. Running costs are of the order of approximately US$ 500,000, supporting core staff, governance and consultants/experts to add information — this does not include the initial development or programming costs, which were one-off costs that were mostly incurred in early 2007. The SFP anticipates annual running costs of approximately US$ 1 million to US$ 1.5 million in future, as coverage increases.

4.8. WWF International

4.8.1. Background

WWF is a well-known international environmental organisation with interests in a wide variety of issues such as protecting wildlife, conserving biodiversity, preserving habitats, empowering people to use resources sustainably, reducing poverty, and enhancing opportunities. They have been involved in fisheries and aquaculture for approximately 15 years. The present seafood campaigns, run from various WWF offices, are part of the broader programme of fisheries work and government policies (under the marine programme) and is currently undergoing a period of strategic review. The seafood campaign incorporates aspects of the market, policies and cross-border cooperation and communication. WWF also works on RFMOs and on marine protected areas (MPAs) around the world e.g. in OSPAR, HELCOM.

As part of the fisheries and aquaculture campaign, WWF produce seafood guides for consumers which use a traffic light system to direct the choices of the buyer. There are 14 national seafood guides, based on a single assessment methodology developed by various WWF offices in collaboration with the North Sea Foundation (NSF).

WWF's seafood campaign has a number of components:

- Informing a range of audiences through a strong online presence – their international website[137] and national websites. Providing information to consumers on eating sustainable seafood. A 'Stinky Fish' website was launched in January 2008, aiming to educate consumers and encourage them to avoid 'stinky' fish — fish caught from over-exploited fish stocks or with the use of destructive fishing gears. However, the 'Stinky Fish' campaign received substantial criticism from industry and since this review began, the website has been taken off-line. WWF also enable consumers to score retailers against criteria regarding their seafood sustainability and sourcing policies, to provide retailers with direct feedback from consumers.
- The Aquaculture Dialogues: In 1999 WWF instigated a consortium with FAO, the World Bank, the Network of Aquaculture Centres in Asia-Pacific (NACAP) and UNEP to develop the International principles for responsible Shrimp Farming (adopted by FAO). Since then, five more dialogue groups have been established for the most dominant aquaculture species in the market: molluscs, salmon, catfish, tilapia and *Pangasius*. Dialogues for trout, abalone and seaweed are due to start soon.
- WWF engage with industry and governments to improve management and stop over-fishing. For example, WWF have established the European Fisheries Initiative to campaign for improvements to the common fisheries policy and an ecosystem-based approach to management to encourage sustainable fisheries in the EU.
- They have been promoting the production of a handbook on negotiating fisheries agreements aimed at developing countries, and advocating for a new framework for negotiating access agreements.
- They are directing a Community Fisheries Programme to help small-scale fisheries around the world gain access to the certification schemes (working with MSC).
- WWF is in cooperation with retailers to help to set up sustainable seafood product ranges.
- WWF has worked also to reduce fishing pressure, strengthen policy and fight illegal fishing.
- WWF are part of the Seafood Choices Alliance, working with trade organisations towards a sustainable industry by working with fish processors to promote stronger purchasing guidelines and sustainably-sourced products.
- WWF have produced a strategy document for businesses and industry (processors, retailers etc.) who may want to become a 'partner' of WWF, this includes provisions in many aspects of supply chain work.

[137] www.panda.org/marine

The website for WWF International covers a broad range of topics and includes information on different aspects of fisheries, including the problems of: bigger nets and faster boats; subsidies; fisheries partnership agreements; illegal fishing; bycatch; destructive fishing practices; and poor fisheries management. There is also an aquaculture section which includes: identifying and promoting best management practices; and gaining industry support for MPAs. The website also addresses some of the impacts of aquaculture such as: competition for space; pollution; escaped farmed fish; parasites and diseases; the use of wild-caught fish for fish feed; the use of wild-caught fish for farming; and conflict with predators. On the website WWF present the unsustainable elements in each of these topics in different sections, these include: overfishing; destructive techniques; management; and illegal fishing. The WWF UK website features: sustainable seafood recipes; the MSC logo; and press release links to the International website.

Other activities to promote their seafood campaign have included consumer awareness work. For example, WWF set up tables in Barcelona next to the plaza near the market centre with sustainable paella made with MSC-certified fish and Galician-caught fish. There was also a celebrity chef there, which is a method they often use to get media exposure.

WWF International has a team of experts working in-house gathering scientific data, conducting field research, and tracking 'emerging' issues. Based on this, WWF International publishes scientific reports and other publications which are fully referenced documents.

4.8.2. What do they claim?

The objective of the seafood guide scheme is to raise awareness and contribute to their overall objective of sustainable fisheries, and be supportive of the work of the MSC. WWF use the seafood guides as a platform to discuss sustainable fisheries. The purpose of this initiative is explained and supported by the availability of information about the current impacts that fishing is having on fish stocks and the environment. Seafood guides are developed by individual WWF country offices, oriented to their specific consumer markets, using guidance from WWF International. 14 countries have produced a seafood guide. The international website provides links to all of the National Organisations websites that have developed a seafood guide or webpage as well as links to non-WWF seafood guides including MCS and Monterey Bay.

The WWF seafood guides use a traffic light system to grade fish as green, yellow or red, depending on their score following assessment using WWF's methodology. The traffic light system is meant to encourage fisheries to move towards green and to stimulate the market. The methodology is referred to on the international website and was developed in collaboration with the Seafood Choices Alliance. The methodology used to create these assessments is not available on either the WWF International website or Seafood Choices Alliance website.

WWF report that the direct impacts of the seafood guides are difficult to assess due to difficulties in assessing stock improvements and attributing causes of any changes. Indirect assessments can be made, such as the amount of media exposure and guides distributed. If a national office has the resources then it may conduct research into consumer knowledge.

There is no limit to the number of species that can go on the lists. There are priority species such as white fish, tuna and shrimp that go on the national lists. Following these, the main species found on the market are also researched and included on the national lists.

The WWF national websites contain a general rationale for why a species is placed in whichever category they are in the guide; these were found to be largely unreferenced and lacking detailed

information. For example, WWF South Africa provides general information on why the species listed are selected. The following examples are illustrative:

- A species is red listed if is illegal to buy or sell in South Africa according to the Marine Living Resources Act;
- A species is orange listed if it is regarded as overfished, associated with high levels of bycatch or has a biology that makes it susceptible to overfishing; and
- A species is green listed if it is sourced from a relatively healthy and well-managed population.

In response, WWF confirmed that South Africa (and Indonesia – see comments below on inconsistencies with Indonesian guide) did not use the international methodology to produce their guide. These offices will both use the November 2008 methodology to produce future guides, and under the common methodology these inconsistencies would be resolved.

This is the extent to which the assessments are justified and no information sources or methodologies are discussed in detail. Of the European WWF offices that have sustainable seafood guides, the English versions of their websites refer the user to seek further information from the WWF International website.

Of the 11 European WWF offices that produce sustainable seafood guides, eight produce a two page guide in brochure format or similar, while the other three (Finland, Poland and Sweden) produce detailed (40 plus pages) publications in their native language. WWF UK and WWF Australia do not produce seafood guides; they redirect users to the Marine Conservation Society (UK and Australian organisations). Many of the pages on the International site that have factual information on them give a reference list at the bottom of the page. At the page on the International website with the links to the national guides there are also links to nine other seafood guide websites including: Seafood Choices Alliance; Environmental Defence Seafood Selector; National Audubon Society seafood guide; Monterey Bay; MCS Fishonline; AMCS; Blue Ocean; MSC available fish products.

4.8.3. How do they do it?

WWF have developed a methodology containing a criteria assessment system in collaboration with the North Sea Foundation (NSF). This process began a couple of years ago, together with Greenpeace and MCS UK — all organisations had hoped to produce one methodology. Owing to different goals and opinions, over time, Greenpeace and MCS UK went in separate directions. With the intent of increasing transparency and consistency there was public consultation built into the methodology development process, which led to changes being made in accordance with the responses. The process also included input from academia/scientists and organisations (including Seafish).

WWF international provides guidance to the national work on fisheries, and it is left to the various offices whether they should choose to adopt the approach of using a seafood guide as a tool within their campaign. The methodology is considered to be a dynamic document which undergoes revision periodically. The methodology was developed by experts from NSF and WWF (contact details provided). NSF was tapped for their expertise in fisheries as their core business is providing information (WWF Netherlands work very closely with them). The assessor uses primary information sources. NSF has assessed some of the MSC-certified fisheries using the methodology and they have typically ended up being placed on the green list. Where MSC products do appear on the lists, WWF ensure that the MSC logo appears next to the species on the list due to the fact that the guide is there as a tool for communications and their objective is to promote sustainable fisheries wherever possible. There are separate methodologies for assessing aquaculture and wild-catch fisheries, within these any species can be assessed. The scoring goes into detail such as the particular catch method and gear; this allows it to go to individual stock levels.

Under new methodology guidelines, developed in November 2008, each guide should be printed with the date of publication however not every office will make a new guide this year. There is a disclaimer on the November 2008 revision stating that they are not to be used by third parties without the consultation of NSF or WWF. To provide consistency, assessments are carried out by either a member of NSF or WWF or an assessor that works closely with WWF and NSF in an agreed assessment procedure, who use primary information for their assessment and have to quote the source of information to guaranty transparency. The completion of these new guides will depend on the resource allocation of the national offices. By ensuring the dates are specified, where there are discrepancies between guides it is possible to check the version of the methodology used, as well as trace the improvements of the ratings of some fisheries. The Hong Kong guide did not have a date on it, but the importance of this is now being stressed. Lists for the same country may differ depending on which revision was used to make to guide.

The new methodology guidelines will be used by all WWF offices producing seafood guides from now on. Norway, Finland, Denmark and Sweden are trying to work towards a common guide. Depending on the objectives of the national office, they may not produce a new guide every year as they may have different priorities — they may produce one every two years for awareness-raising purposes. For example, WWF Netherlands have produced a guide for the last three years as they embarked on a multi-year seafood campaign for the period 2006–2008 (in 2009 another seafood guide will be produced by NSF-WWF, under the initiative of NSF).

In terms of communication and transparency, the November 2008 methodology guidelines are not yet available to the public, but WWF intend to make them publicly available in the near future.

The following assessment is based on the WWF International 'Methodology for assessing wild-caught species' and the 'Methodology for assessing farmed species'. Many of the criteria that were identified as necessary for a system to be in alignment with the FAO guidelines were covered in these documents to some extent. The documents use similar breakdowns within the documents as the FAO e.g. management, ecological and biological. There are 15 criteria for wild-caught stocks and 19 for farmed. A selection of answers assigned with different scores allows the fishery to be graded in the traffic light system. Some are scored simply 0 or 1, others are scored up to 2 or as low as –3. There are some points from FAO guidelines that are not made reference to, but given the extent of the FAO criteria and their focus on certification and ecolabelling schemes, it is not expected that NGO information schemes will cover all aspects of the FAO guidelines comprehensively — some points were not covered because they were relevant to certifiers only. The main aspects of the WWF criteria for fisheries and aquaculture, and comments on their coherence with the FAO guidelines are outlined below.

Fisheries

- The management system

- All of the criteria from the FAO section were included except the two points relating to compliance to laws, legislations and compliance to regulations of monitoring. The fishery will fail if stock assessments are not factored, and the fishery will score more highly the more 'precautionary' it is, even though the term 'precautionary' is not used.

- Stock under consideration

- These factors are covered in six assessment questions. They would not green list a fishery that was categorised as 'over fished'.

- Ecosystem

- The criteria include coverage of impacts on the ecosystem, and include whether the management system is addressing these impacts.

Aquaculture

- Animal health and welfare

- Animal health is addressed in two criteria: whether the production system impacts the health of the species; and, whether diseases transferrable to the wild. 'Stress' is an issue of fish health and welfare which could be viewed as being covered by their question on 'production system impacts' under the category of 'other' issues.

- The focus is more of the surrounding environment and the impacts of the farm of its surrounding area rather than the culture environment.

- There is no mention of polyculture or the use of drugs.

- Food safety and quality

- Issues of food safety and quality are not directly addressed, thus not addressing this aspect of the FAO draft guidelines.

- Environmental integrity

- Environmental integrity is the central focus of the questions in the criteria, and covers most of the points from the FAO on this topic.

- Social responsibility and support for resource-poor small-scale farmers

- The criteria do not include any of the FAO points on social responsibility.

Other points:

- They have provisions for sustainability and steer towards this aspect, organics is not included with separate criteria, and social aspects are considered by WWF to be a logical inclusion, however they are not included in the criteria thus have no impact on the rating of the fishery.

- Data-deficient fisheries can be included although they would score lower in the methodology. Some data-deficient fisheries have been assessed e.g. spiny dogfish fisheries.

4.8.4. What are the results?

In consultation about the effects of their initiative, WWF said that the direct impacts of such a scheme are difficult to assess due to difficulties in assessing stock improvements and attributing causes of any changes. Indirect assessments can be made on things such as amount of media exposure and number of seafood guides distributed. If a national office has the resources then it may conduct research into consumer knowledge. The WWF International website suggests to readers that if you were to follow their guidance then direct environmental benefits would result: '*the solutions are in our hands, because the seafood you choose can determine whether tomorrow's generations will continue to enjoy the oceans*', '*If you buy, or ask for, seafood that comes from sustainable sources you are helping to protect our marine environment and, at the same time, ensuring that seafood can be enjoyed for many years to come*'. There are no examples given that demonstrate instances where direct improvements have been shown in fisheries but results of indirect indicators may show some trends.

WWF Communications puts a lot of thought into how to reduce the level of confusion for the consumers. For example, the phrasing of the guides has improved over the years and there have also been improvements in the distinctions that are drawn between fisheries/fishing method, and more detail into the origin of the fish.

4.8.5. Organisational costs and funding

The website states that WWF are particularly concerned with the access of small-scale fisheries and aquaculture and want them to receive the same opportunities as the large-scale organisations. To support this they have developed the Community Fisheries Program which is '*currently working on more than 15 projects worldwide, successfully emphasizing the participation of local fishers and engaging communities in protecting the resources they rely upon*'. WWF provide support to small-scale fisheries by helping them source funding.

There is no direct cost to the consumer associated with the provision of the information or the seafood guides and scorecards. All WWF initiatives and schemes are funded mainly by the national organisations, and then the next major contributors are Government and Aid Agencies, Trusts and Foundations, and Corporations. The budget for the seafood work is dependent on the national office budget. The global sustainable seafood project was € 1 million over 3 years; this includes coordination work and funding for several of the offices to develop their seafood guides. In addition to this there is additional national funding.

WWF International is determined to drive for sustainable fish sourcing concerning many aspects of the fishing industry. Some of the offices have conducted research into market trends. They have a 'market transition network', which looks at the transfer chains on many products — within this scope is the seafood market strategy.

4.8.6. Comparison of species ratings between national seafood guides

Three species of fish were chosen for comparison across a range of the WWF seafood guides. The categorisation of these species was examined across 13 of the WWF seafood guides. The results are shown in Table 18 including the categorisation of the fish in the MCS guide for the UK — WWF's preferred seafood guide for the UK as they have not developed their own list for the UK.

Results showed consistency in the categorisation of organic aquaculture Atlantic salmon on the 'green' lists, non-organic aquaculture Atlantic salmon on the 'yellow' list, and wild Atlantic salmon on the 'red' lists. Denmark, Spain and Finland did not distinguish between the different types of Atlantic salmon, and Denmark did not specifically make reference to 'Atlantic' salmon, but they all placed salmon/Atlantic salmon on the 'yellow' list. This species did not appear on three of the guides: South Africa, Norway and Indonesia. Alaskan Pollock did not appear on seven of the guides: Hong Kong, Poland, Finland, Spain, Indonesia, Germany and South Africa. Where it did appear it was categorised on the 'green' list. Yellow fin tuna did not appear on four of the guides: Finland, Belgium, Switzerland and South Africa. It was categorised as 'red' on five of the guides: Netherlands, Germany, France, Denmark and Norway. The Indonesian guide categorised Yellow fin tuna as 'green' on their guide (dated 2005) rather than 'red' because they considered it to be a better choice in relation to other species consumed locally that are under more severe threat. On other guides: Spain, Poland, UK (MCS) and Hong Kong; Yellow fin tuna is categorised as 'yellow' and not 'red' apparently because of differences in the time of assessment, NSF report that this transfer to 'red' occurred approximately 1.5 years ago.

The Indonesian (2005) guide and WWF South Africa guide did not use the international methodology, both offices are aware that from end 2008 they need to use the revised methodology if they are to produce another seafood list.

Table 18 Comparison on WWF seafood guides of the rating for Atlantic salmon, Pollock and Yellow fin Tuna

Country	Atlantic Salmon		
	Organic - Aquaculture	Non-organic - aquaculture	Wild
Netherlands	Organic aquaculture salmon from Scotland & Norway is 'first choice'.	Non-organic salmon from Scotland and Norway is 'second choice'.	
South Africa	Doesn't appear		
Switzerland	From aquaculture in Scotland & Ireland with a Bio label is a 'Fish to eat'	Salmon from aquaculture in Europe and Chile is 'think twice'.	And, fished from the N Atlantic is 'don't buy'.
Belgium			Salmon from the Atlantic, Scotland and Norway, is on the 'prefer not' list.
Germany	Organic aquaculture salmon from Scotland, Norway & Ireland is 'good choice'.	Aquaculture salmon form Norway and Scotland is 'second choice'	Wild salmon from the NE Atlantic is 'rather not list'.
France		Aquaculture Atlantic Salmon from various countries is 'with moderation'.	Wild Atlantic Salmon from the North Atlantic is on the avoid list.
Denmark	Salmon (not specifically Atlantic) is 'yellow'.		
Norway	Doesn't appear		
Indonesia	Doesn't appear		
Spain	Atlantic Salmon is 'acceptable'.		
Finland	Atlantic Salmon is on the yellow and red light system.		
Poland	Salmon farmed in Norway is on the green list.		
UK (MCS)	Organically farmed salmon certified by the SA is on the 'Eat' list.	Atlantic farmed salmon is 'cautionary'.	Atlantic wild caught is on the avoid list.
Hong Kong	Doesn't appear	Atlantic farmed salmon from Norway is in the category "Think Twice"; concerns are expressed about parasites, feed supply, waste and escapement.	Doesn't appear

Country	Alaska Pollock	Yellow fin Tuna
Netherlands	Alaska Pollock from the wild with MSC certification is first choice.	Wild Yellow fin Tuna from the Indian Ocean is 'prefer not'.
South Africa	Doesn't appear	Doesn't appear
Switzerland	Fished from the NE Pacific either MSC certified or not is first choice. Fished from the NW Pacific is 'don't buy'.	Doesn't appear
Belgium	Is on the first choice list.	Doesn't appear
Germany	Doesn't appear	Wild caught is on the rather not list.
France	Alaskan Pollock from the North Pacific that is certified by MSC is on the green list.	"Red" tuna from various countries is on the avoid list.
Denmark	"Alaskan property" (not specifically Pollock) is 'green'.	Fresh tuna is 'red', & they suggest to find an alternative or buy MSC certified tuna.
Norway	Alaskan Pollock is 'green'.	Yellow fin tuna is 'red'.
Indonesia	Doesn't appear	Yellow tail tuna is on the safe list.
Spain	Doesn't appear	Yellow fin tuna is 'acceptable'.
Finland	Doesn't appear, the *Pollachius virensis* is listed as green.	Doesn't appear, the Blue fin tuna is red.
Poland	Doesn't appear, the *Pollachius virensis* is listed as green though.	Tuna other than the Bluefin tuna (red) is on the yellow list.
UK (MCS)	Alaska Pollock that is MSC certified is on the Eat list.	Purse seine from the Indian Ocean or East Pacific is on the orange cautionary list. All other stocks are yellow cautionary.
Hong Kong	Doesn't appear	Global stocks (as a whole) of yellow fin tuna are in the category "Think Twice"; concerns are expressed about stock status (though it is listed as "less sensitive to fishing pressure than blue fin tuna") and potentially high bycatch.

4.9. WWF Hong Kong

4.9.1. Background

WWF is the highest profile NGO in Hong Kong and has produced its own seafood wallet guide which it launched in March 2007. This seafood wallet guide is supported by the 'Hong Kong Sustainable Seafood Guidebook' and both the wallet guide and the guidebook are available on the internet. WWF-Hong Kong states that the recommendations in the wallet guide and the guidebook are consistent with the recommendations of the WWF network, however for seafood species that are only relevant to Hong Kong, the recommendations were determined by WWF-Hong Kong independently.

WWF-Hong Kong has five major themes for its conservation work: freshwater and wetland, terrestrial conservation, climate change, footprint (seafood and timber) and marine conservation. The wallet guide and the guidebook were fixed-term efforts of WWF-Hong Kong under their Seafood Choice Initiative with a finite budget and a specific timeframe. Several further fixed-term efforts to promote the wallet guide and guidebook have been undertaken since they were released in March 2007, but these also had finite budgets and specific timeframes.

WWF-Hong Kong does not have similar schemes for products other than seafood but in April 2009 WWF-Hong Kong launched a 'Low Carbon Living Appliances' guide. This guide provides a comparison of products but does not classify products into categories such as red/yellow/green. WWF-Hong Kong also has an SOS (Save Our Seas) campaign of which one of the goals is to designate 10% of Hong Kong's waters as no-take zones.

WWF-Hong Kong launched its wallet guide and guidebook with a press event and local celebrities; they have also publicised it through restaurants and other events. The materials, which are in English and Cantonese were designed by WWF-Hong Kong to target corporate and individual consumers, restaurants/hotels, traders/retailers, caterers and schools. Outreach efforts have been mainly targeted towards consumers although some restaurants do consult the materials when selecting fish to place on their menu. WWF-Hong Kong has already approached major supermarkets and Cathay Pacific airlines about using the materials, but the actual uptake of the information by these parties is unknown.

4.9.2. What does the scheme do?

The WWF-Hong Kong seafood guide and wallet card cover both wild caught and aquaculture species. While the materials say they cover 'over 60 species', some of the entries appear to have the potential to contain multiple species (e.g. 'clam', 'abalone', 'squid', etc.) and thus it is highly likely that more than 60 species are included. Each species is listed in either the red ('avoid'), yellow ('think twice') or green 'recommended') category.

By design, all fish species listed in the materials are sold in Hong Kong in 'wet markets, supermarkets, seafood restaurants and frozen food shops'. The origin of the fish could be any country supplying fish to Hong Kong. The materials list each species and a country or region from which it may be sourced. Some species are listed under different countries or regions with different recommendations, e.g. Leopard coral trout – Australia is 'Recommended', but Leopard coral trout – SE Asia is 'Avoid'. Some of the 'origins' are very specific (e.g. South Georgia, UK) whereas some simply read 'Global' or 'North America'.

The stated goal of the materials is 'to influence the behaviour of consumers and the seafood industry towards sustainable consumption'. The broader goal of the WWF-Hong Kong Seafood Choices Initiative, of which the materials are a part, is:

1. to provide credible information on the environmental impact of consuming seafood commonly available in Hong Kong and South China;

2. to influence the behaviour of consumers and the seafood industry towards sustainable consumption; and
3. to promote the Marine Stewardship Council (MSC).

The guidebook has sections describing desired uptake by traders, restaurants, individual consumers and corporate consumers.

4.9.3. How does the scheme work?

The guidebook quotes an FAO definition of sustainability:

"*fishing activities that do not cause or lead to undesirable changes in the biological and economic productivity, biological diversity or marine ecosystem structure and functioning from one human generation to the next*."

The wallet guide itself does not give a definition of sustainability.

There is only a general reference to the WWF website on the wallet card. The guidebook lists nine other sources of information (other WWF schemes, Monterey Bay Aquarium, UKfishonline, FAO, CITES, etc). The WWF-Hong Kong Seafood Choice Initiative website provides only one external link, to the Marine Stewardship Council. One of the three goals of the WWF Seafood Choice Initiative was to promote the MSC. MSC logos are shown next to recommended fish 'species' which are MSC-certified.

The guidebook explains the standards used to assess the species in the guidebook and the wallet card in a broadbrush manner. However, it would be impossible to conduct an independent review of whether the standards were applied correctly to each fishery as not enough detail about the standards and the scoring system is provided in the report. The guidebook explains that recommendations are based on two sets of criteria (one for wild caught species and another for farmed species) developed by a group of non-governmental organisations in Europe including Greenpeace, the UK Marine Conservation Society, the North Sea Foundation and other offices of the WWF network. WWF-Hong Kong staff indicated that the assessment criteria have evolved over time. Therefore the version used by WWF-Hong Kong to produce their seafood guide in March 2007 has been modified to produce the latest version of the assessment criteria which is now used as the basis for seafood guides prepared by offices within the WWF network.

The guidebook gives five criteria for evaluating wild caught fish and five criteria for evaluating aquaculture species. While there is a page of explanation on the rating of each 'species' in the report, no references are given and the assessment criteria, as given in the report, are qualitative and general:

The assessment criteria for wild caught species are:

- biology;
- status of wild populations;
- bycatch;
- impacts on the environment; and
- fisheries management.

The assessment criteria for aquaculture species are:

- condition of the farmed fish;
- fish feed;
- source of fry;
- impacts on the environment; and
- mariculture management.

Upon request under this study, WWF-Hong Kong provided the detailed methodology used to develop the recommendations published in March 2007:

The criteria and subcriteria for wild caught species comprise:

- Biological characteristics: stock status and inherent vulnerability;
- Ecological effects: bycatch/discards and habitat damage;
- Management: management system, compliance, enforcement and traceability.

The criteria and subcriteria for aquaculture species comprise:

- Production system and siting: energy, wastewater, habitat alteration and animal health;
- Feed: volume, efficiency, sustainability and additives;
- Ecological effects: discharges, feed sourcing, disease, parasites, other ecological effects;
- Management: environmental planning, regulatory compliance, traceability and community contribution.

Under each criterion/sub-criterion points are awarded (from as low as –2 to as high as +2 in some instances, simply 0 or 1 in others). The system is apparently designed so that points are tallied for all questions into a single score, but the means by which this score is translated into red ('avoid'), yellow ('think twice') or green ('recommended') is not given. There are no 'must pass' criteria.

The methodology applied in the WWF-Hong Kong seafood guide was not subject to peer review. However, as mentioned above the methodology was subsequently modified as part of a broader WWF-International methodology development effort. According to WWF-International the result of this effort was subject to an external scientific review followed by a public stakeholder comment period lasting several months. WWF-International wishes to ensure transparency of the final methodology and thus plans to post it on the internet, but the methodology used by WWF-Hong Kong will not be posted.

Furthermore, WWF-Hong Kong, in line with WWF-International policy, does not intend to release the results of individual species' assessments as they consider this proprietary information to be shared only with parties who improve their supply chain and contribute financially to the assessments. It is noted that a lack of disclosure of this information precludes an evaluation of the consistency and appropriateness of the scoring. It also, despite WWF-Hong Kong's assertion that the latest available information was used, precludes an independent evaluation of the quantity, quality and sources of information. Therefore despite a desire to appear transparent regarding the methodology, the system is not and at present does not intend to be transparent in terms of the application of the methodology to individual species' assessments.

The WWF-Hong Kong Seafood Guide makes no explicit reference to data-deficient fisheries.

The process of compiling the guide was mostly internal to WWF-Hong Kong. No public consultation was conducted. After the initial compilation by WWF-Hong Kong it was reviewed by others within the WWF network and the Seafood Choice Initiative team. Hand-picked, often species-specific, experts provided advice on specific species and presumably this was incorporated and reflected. Technical input by individuals is documented in the acknowledgements section of the report but not referenced or otherwise linked to specific assessments.

The guide was published in early 2007. Since no references are given, it is not possible to confirm how recent the information that was used in developing the recommendations was at the time of publication. The website states that the guide will be updated periodically, but does not give a timeframe.

4.9.4. What are the results?

Although environmental benefits would seem to be the purpose of the scheme, no specific claims have been made (or verified). Although the aquaculture criteria make a reference to community effects, the scheme does not seem structured to result in social benefits, and no such claims in this area have occurred either. There is no price premium expected since this is not a labelling scheme, and no economic benefits are claimed.

4.9.5. Organisational costs and funding

There is no cost to product producers or traders who are included in the scheme. The guide is distributed free of charge.

The WWF-Hong Kong seafood guide was supported by MFJebsen International, a Hong Kong-based venture capital fund. WWF-Hong Kong also contributed from its own general funds which are supported by public and corporate donations. As mentioned above, the seafood guide was a fixed-term effort and is not continuously ongoing. Although the website states that the guide will be updated periodically, at present there are no firm plans for the timing and funding of an updated guide.

5. Supermarkets

During the review, the supermarket sector was investigated in two distinct phases. In Phase 1 we reviewed the fisheries sustainability information provided by three leading international supermarkets; Carrefour, Tesco and Wal-mart. In Phase 2 we expanded this review to include information from 25 supermarket websites to give a broad feel for how supermarkets communicate sustainable seafood sourcing to consumers. The review sought to determine if the stores have a commitment to sustainable seafood and include it in their sourcing policies. The source of the information that the supermarkets use was also investigated e.g. whether they follow particular NGO recommendation lists (WWF, Greenpeace), and to whom they advise consumers to go for further information.

The supermarkets section is therefore presented in two sections: (i) a review of the three supermarkets (Carrefour, Tesco and Wal-Mart) which underwent the benchmarking process; and (ii) the review and comparison of 25 supermarket web sites..

5.1. Review of Carrefour, Tesco and Wal-Mart

5.1.1. Background/Scope of the Supermarkets

The goals of the supermarkets vary, but all intend to continue to improve the amount of seafood that is sourced sustainably, in all forms. Wal-Mart is the largest retailer in the world and made a commitment in 2006 to 'source all wild-caught fresh and frozen fish for the U.S. and UK market from fisheries that meet the MSC's independent environmental standard within the next three to five years'. Tesco has made a similar, but considerably less specific promise, to buy all of their seafood from responsibly-managed fisheries. Tesco is also involved with sustainable timber, palm oil and biofuels. The French-based supermarket chain Carrefour has businesses around the world and labelled fish products are sold in France, Belgium and Columbia.

5.1.2. What do they claim?

The supermarkets do not appear to provide information on the issues surrounding the sustainable seafood industry. Rather, they just state that they are aware of the issues and their intentions are to support and do their best for the longevity of the industry through responsible sourcing.

5.1.3. How do they do it?

Of the three supermarket chains assessed, all had a website outlining their intentions. Wal-Mart did not provide a definition of sustainability with regard to seafood. Although Tesco also did not define it, factors which affect the sustainability of products were listed: stock depletion and impact on ecosystems; aquaculture; climate change; packaging and socio-economic issues. Neither Tesco nor Wal-Mart provide a comprehensive guide to seafood sustainability, but Tesco do provide links to the MSC website and feature its logo on their page. Wal-Mart do not state they develop fisheries standards, but they aim to stock MSC- and ACC-certified products. They do develop standards for ethical sourcing and labour requirements, but it is not clear if these are applied also to fisheries or if they accept products if they are certified by MSC and ACC without further assessment (MSC, for example, does not include social or labour issues in its standard). Tesco include farmed fish in their animal welfare policy which states that the farms have to belong to a certification scheme and they are subject to unannounced audits. They also use the FAO Code of Conduct for Responsible Fisheries as their sourcing reference.

Tesco has two websites: .com and .plc. The sourcing information is on the .plc website, making it somewhat harder to find. Wal-Mart have all of their information on one site which makes it easier to navigate. Tesco promote products in a variety of ways: labels/information at fish counters, magazines, in-store TVs and touch screen sales.

Carrefour has websites in each country and a general .com website, which is designed more for providing information to investors rather than to consumers. Their overall policy on corporate social responsibility is included there and incorporates environmental standards, including sourcing policy, traceability and also social standards (labour and human rights). Their 'Repsonsible Fishing' approach started in 2004.

Since 2000, Carrefour inspectors have been monitoring the compliance of incoming fish for minimum size. In 2005 in French and Belgian Carrefour supermarkets, a label/brand called '*Pêche* **responsible**' (Responsible Fishing) was launched for four frozen products guaranteeing optimal traceability and stock management as well as respect for the ecosystem. In 2008 supermarkets in France launched MSC-certified frozen products under the Carrefour Agir Éco Planète brand, as well as MSC-certified fresh products. It has developed a range of quality farm-raised fish with limited environmental impact (Carrefour Quality Lines). The Carrefour group also promotes herbivorous species in its fresh seafood department, limits the inclusion of deep-water species, and favours farmed shrimps certified by GAA.

In Columbia, Carrefour developed a social policy in 1999, based on 4 key areas: education; the fight against social exclusion; sustainable development; and environmental protection. In 2003, Carrefour signed an agreement with the Colombian environment ministry on the marketing of environmentally-friendly products. Several labels offer 'sustainable' products which include 'Calidad Natural', which included products that are good for your health and the environment. Carrefour Colombia has 13 Carrefour Quality Lines (includes fruit and shrimps, mojarra fish and Chilean salmon). Carrefour Colombia launched the Carrefour Agir brand in April 2007, which includes a range of organic products.

"Carrefour is the largest retailer in Europe and the second largest in the world, second only to Wal-Mart. Originally based in France, in 2005 Carrefour operated more than 12 000 stores located in 30 countries and declared sales of almost €100 billion (approximately US$130 billion). In 1985 Carrefour began producing its own-brand products and retailing them in addition to products under other brand names. In 1992 Carrefour initiated the development of so-called Carrefour Quality Lines (CQL), which are certification schemes through which products are identified on the basis of specific quality attributes and marketed with labels indicating their ownership to the scheme (consumer-oriented certification). CQL cover different aspects of the broad sustainability targets of Carrefour that include safety, environmental protection and the socio-economic development of the regions where Carrefour operates. In 1997 Carrefour also introduced the Carrefour Bio line for organic products, later replaced by the Carrefour Agir label, developed in harmony with the France AB organic government label. Products under the Carrefour organic label are certified by ECOCERT, an independent certification body. Gradually, Carrefour also began promoting fair-trade products and developed CQL based on fair-trade criteria." AFCIP & FAO 2007).

5.1.4. What are the results?

The results for the supermarkets can be considered in both the volume of sustainable seafood sold and the number of range of products available to the consumers. Tesco pledge that all of their fish is from sustainable stocks, but do not provide consumers with information on how they ensure this is achieved.

Even though information about the various initiatives and ecolabel launched by Carrefour are available on the website, very little information if any is provided about where their information comes from and

how their 'strict environmental criteria' are assessed. Carrefour claims that it raises awareness of consumers and industry stakeholders about these products.

5.1.5. Organisational costs and funding

The supermarket schemes reviewed in this section are all funded by through their own revenues.

5.2. Review of supermarket websites

Table 19 lists the supermarkets that were included in the extended supermarkets review which expanded coverage to 25 different companies (see box at the end for a list of web sites). Of the 25 supermarket websites, 18 of them mentioned, on some level, sustainable seafood. The extent of the information varied greatly from just mentioning that they stock sustainable seafood products, to a much more comprehensive approach including: giving pages of information on the issues surrounding seafood e.g. fishing methods, overfishing etc.; links to further information; detailing all of the ecolabels; and the other work that they are involved with concerning seafood.

The supermarkets have several methods available to them in order to communicate sustainable seafood information to consumers such as in-house magazines, advertising in stores, labelling and information on packaging and on fresh fish counters, and their websites. The scope of this investigation was to review the websites[138] — not to do any field research or make direct contact with the supermarkets. Many of the websites were used by the stores to provide information on the extent of their commitment to sustainable seafood and other efforts in this area.

Table 19 Summary of the supermarkets whose consumer information provision was investigated, the origin country of the website that was looked at and whether they had any information about fish sustainability on the website

Store	Country	Information	Store	Country	Information
Marks & Spencer	UK	✓	EDEKA	Germany	✓
Waitrose	UK	✓	Kaufland	Germany	✓
Sainsbury's	UK	✓	Aldi	Germany	×
Coop	UK	✓	LiDL	UK	✓
ASDA	UK	✓	Metrogroup	Germany	✓
Tesco	UK	✓	Carrefour (Cora)	France/Belgium Europe	✓
Wholefoods	US	✓	Auchan	France	✓
Wal-Mart	US	✓	Champion	France/Spain Portugal	✓
Albert Heijn	Dutch	✓	Pingodoce	Portugal	×
Continente	Portugal	×	Delhaize	Belgium	×
Migros	Switzerland	✓	El Corte Ingles	Spain	No food on website
Mono prix	France	✓/×	Morrisons	UK	✓

**Dia (Spain) was also investigated but is part of Carrefour and does not have its own website.*

5.2.1. The stores commitment, do they commit/make any promises?

Most of the stores outline that they have a sustainable sourcing policy and that they are always working towards more sustainable sourcing.

[138] Annex 2 contains the web addresses where the information was sourced from for the review.

Waitrose state that they will not sell any vulnerable species or fish from overfished stocks, and as prove of this commitment, they withdrew from North Sea cod and haddock fishery in 1999. They are also working on sustainable sources for feed fish by 2010, in partnership with MSC, Soil Association, Aquascot.

Sainsbury's have a decision tree that they have developed with stakeholders to decide what fisheries they will source from. They make the commitment that 100% of their wild salmon comes from MSC-certified sources. They choose to make the focus of their efforts the 'big 5' (cod, haddock, salmon, tuna and prawns) which account for 80% of all fish sold every week. They have plans to convert the 'big 5' species they stock to 'green' rated (green rated is 'sustainable', red rated is 'endangered', according to the Sainsbury's decision tree) by 2010. This means moving cod, haddock, salmon, tuna and prawns to 100% sustainable sources, ensuring that the fish are caught or reared with minimal impact on stocks, ecosystems, and the wider environment. Sainsbury's also pledged to re-double sales of MSC-certified fish, by the end of 2008. They make a commitment on issues such as working towards sustainable aquaculture feed, anti-foul on nets, and line-caught sourcing. They have projects working with suppliers, fishermen, vessel owners and the Governments in Sri Lanka and the Maldives to make fresh and canned tuna fully MSC-certified. 100% of its canned tuna should now be pole and line caught methods. Its counters are certified, and it has more than 22 products so far. Sainsbury's achieved Seafood Retailer of the Year.

Coop claim their own brand products only come from responsible sources including frozen, chilled, canned and ready meals.

ASDA have set themselves a target of sourcing 100% sustainable seafood by 2010, and they have already taken endangered/threatened species off their shelves. Their fresh fish should all have the origin and catch method written on it, and all of their fish counters have apparently successfully completed the MSC's 'chain of custody' audit. They are now concentrating on helping their suppliers achieve MSC approval for their fisheries. Wal-Mart have set 100% MSC fish target for North America for its range of fresh and frozen seafood.

Tesco make several statements concerning sustainable seafood. For instance '*We work daily to ensure that the wild and farmed seafood we sell comes from fisheries that are managed responsibly'. 'We're also fully committed to working with industry and fisheries organisations which support the principles of sustainable fisheries development'.* The evidence to support this claim is that over 400 of Tesco fish counters are approved to sell fish certified by the MSC; they also sell many fresh, frozen and canned fish products that are MSC-certified. Farmed fish suppliers must be members of an independently audited and certified farm assurance scheme.

Wholefoods are increasing the number of products and indicate that they do have sustainable seafood available on their shelves. They also stock MSC-certified species such as Patagonian toothfish from South Georgia.

Migros remove overexploited species e.g. rays, and give consumers a wide choice of options from sustainable and environmentally friendly aquaculture.

Lidl offer MSC-certified products in 16 countries and are continually expanding their range.

The Metrogroup by the end 2007 had 40 MSC-certified products and they aimed to have this number up to 80 by 2008. MSC-certified products are available in Metro stores in Croatia, Austria, Poland, Romania, Russia, Serbia and the Czech Republic.

The Auchan group are promoting sustainable fisheries in France by 1) increasing the minimum catch size of certain species; 2) suspending sales of other species during their breeding seasons or on the basis of the methods used to catch them; and 3) promoting sales of species where stocks are recognised as being sustainable.

Champion applies EU requirements aimed at preventing resource depletion and overexploitation. They select seafood from fishing methods which are not harmful.

Albert Heijn avoids overfished or vulnerable fisheries, and they acknowledge the capture method and they state that they also consider the sourcing of their shrimp.

Kaufland refer to their commitment to future generations of seafood and strive to continually expand their measures for promoting these fisheries, they are trying to provide alternatives to the popular but threatened species. In the Greenpeace German supermarket review in December 2008 they came second.

EDEKA states that it supports sustainable fisheries.

Morrisons pledge to only sell fish from sustainable waters. They sell a wide variety of fish, and have labels to explain to the customers how it was caught and its origin. After an independent audit Morrisons met the strict criteria for traceability set by the MSC. This certification ensures that all stages of the supply chain, from catch to counter, are certified.

Delhaize states that they do have some MSC product in their stores.

At the time of the investigation for this report it was not possible to find any information on sustainable seafood sourcing on the following supermarkets websites: Aldi, Pingodoce and Continente.

5.2.2. What other involvement do they have?

ASDA state that they are lobbying national and international governments to support and improve policies which protect marine habitats. In 2006, ASDA called for the North Sea to be declared a marine conservation zone to preserve fish stocks and protect the livelihoods of the local fishermen who depend on it.

Marks & Spencer are involved in initiatives with fishermen.

Migros is part of the WWF Seafood Group which brings together Swiss businesses in order to prevent overexploitation of fish stocks. Being a member of this group allows Migros to contribute to WWF's work on sustainable fisheries and sustainable seafood.

Metrogroup are involved with a pilot project initiated by Deutsche See GmbH, METRO Group aimed at reducing discards. It is called the 'Stopp Discard' pilot project and seems to be funded by the European Union. They are also involved in the provision of training programs for the local fishing industry at various locations in India (1,150 fishermen), and training programs are also being trialed for suppliers in Pakistan. Seminars for local fish farmers within these programs were demonstrating environmentally-friendly farming and fishing methods as well as hygiene techniques. Metrogroup are also working with WWF to reduce tuna fishing quotas in the Mediterranean.

Champion established a partnership with WWF in 2002 but did not provide much more information.

Albert Heijn have been working with WWF to promote sustainable fisheries since 2007, supporting several projects, such as a project to reduce turtle by-catch in tuna fisheries, and a project in collaboration with their supplier and the Wageningen Imares Research Institute to improve eel stocks.

Kaufland mention in their website that they are involved in dialogue with Greenpeace on the issue of sustainable seafood and are using their expertise.

5.2.3. Do they have sourcing policies?

On the **Marks & Spencer** website, they have listed how each individual species that they stock is sourced.

Coop claim to have rigorous policies in place to source from suppliers with good practice, they have produced their own criteria to assess suppliers and have three separate sourcing policies for tuna, farmed fish and wild-caught fish. These sourcing policies cover a range of issues and are all available on the website.

Albert Heijn describes their sourcing policy as progressive for sustainable fish. They have been developing the sourcing policy over the past few years. They state that they source anchovies from Italian suppliers with small boats who use capture methods with reduced impacts. Their *calamari* suppliers use a mid-trawl catch method which does not cause any damage to the seabed. On the website they state that 40 of the fish that they stock are from a fixed source, they expand on this by describing how each of those sources is chosen and in what way this reduces impacts. Where the fish are from MSC they provide a link to the MSC website.

Kaufland state that they support the sustainable seafood industry by incorporating sustainable sourcing into their purchasing policies.

5.2.4. Which ecolabels feature on the supermarkets websites?

The MSC label was the most recurrently mentioned ecolabel by the supermarkets; nearly every supermarket that had chosen to post information about sustainable seafood on their website included details of MSC. Many of them also described what MSC is and what it does. If the MSC was mentioned then the label would be evident and nearly always the webpage would provide a link to the MSC website. Freedom Food was the label that was most frequently mentioned as the choice for aquaculture. Aquaculture and the associated ecolabels were not mentioned as frequently as the MSC, but on the webpages that covered sustainability more expansively, they outlined the issues with aquaculture and where they would try to include provisions for it in their policies. The Earth Island Institute was also mentioned on a number of sites.

Kaufland provide the most comprehensive guidance to ecolabels. They have a webpage with the different ecolabels displayed and outline what each of them stands for and they provide links to the websites, including MSC, Naturland, Bio Fische and SAFE. To reduce confusion for the consumer they use a green sticker to show that a fish is not endangered and from a good sustainable source, this is also displayed and explained on the website.

5.2.5. What information do the websites include?

In the UK, Marks & Spencer, Waitrose, Sainsbury's, Morrisons and the Co-op all include information of the impacts of different fisheries and the positive effects that sustainable seafood choices can have on the situation. The issue of traceability is mentioned by the more detailed sites such as Waitrose.

Of the non-UK supermarkets reviewed, the information that was provided varied and included different levels of detail. Kaufland had several pages of information available. They expressed their belief in the high importance of environmental protection, responsible fish handling and being able to enjoy seafood into the future. EDEKA had one 'to-the-point' information page of reasonable length and content coverage. They detailed the impacts and the problems in the fishing sector and also described the process of certification (they were 8th in the Greenpeace German supermarket review). Migros discussed the over-exploitation of fisheries and Lidl also gave some facts. The Metrogroup specifically dealt with the issue of fisheries discards and briefly discussed some of the other issues. The Champion website outlined what fair and responsible fishing means and outlined the importance of the size of the fish caught, overexploitation and resource depletion.

The source of information that the supermarkets use as the basis for their sourcing policies, efforts, descriptions of problems and facts are of interest to this study. This information underscores the importance of organisations who are frequently quoted and whose presence is significant in the arena of fisheries sustainability information. The MSC are by far the most frequently referred to. Consumers are given various assurances about MSC-certified products including: they promote responsible environmentally friendly sourced fish; MSC is trying to offer a solution to the problem (Albert Heijn); MSC are a sign of a responsible and sustainable fishery.

Links to external websites were sometimes provided by the supermarkets websites. The Coop website provides a link to both Seafish and MSC. Wholefoods, Metrogroup and Tesco also provide a link to the MSC website. Tesco refer to the MSC and state that they help to preserve fisheries for future generations.

Supermarket	Website
M&S	http://www.marksandspencer.com/gp/node/n/46526031
Waitrose	http://www.waitrose.com/food/foodissuesandpolicies/sustainablefishing.aspx
Sainsbury's	http://www.sainsburys.co.uk/food/foodandfeatures/safety_quality/articles/fish.htm?prevUrl=%2fsearch.htm%3fquery%3dpolicy%2bfish%2bsustainable%26x%3d0%26y%3d0
Coop	http://www.co-operative.coop/food/food/Own-brand-fish/Tuna-sourcing-policy/
Asda	http://www.about-asda.co.uk/
Tesco	http://www.tesco.com/greenerliving/what_we_are_doing/sustainable_living/default.page?#L8
Wholefoods	http://www.wholefoodsmarket.com
Wal-Mart	http://walmartstores.com/Sustainability/7988.aspx
Migros	http://www.migros.ch/FR/Gamme_produits/Engagement/MSC/Seiten/Apercu.aspx
LiDL	http://www.lidl.co.uk/uk/home.nsf/pages/c.o.fish.s.wilk
Metro Group	http://www.metrogroup.de/servlet/PB/menu/1161760_l2/index.html http://www.metrogroup.de/servlet/PB/menu/1183120_l2/index.html#a2
Auchan	http://www.groupe-auchan.com/index.jsp?lang=EN
Champion	http://www.champion.fr/champion/site/menucorporate/engagement/produitssolidaires/CI_35f37d2869520110VgnVCM10000084e6320aRCRD/la_peche_equitable.htm
Continente	http://www.continente.pt//ProductsCategory.aspx?CategoryName=8&CategoryPath=
Pingo doce	http://www.pingodoce.pt/
Albert Heijn	http://www.ah.nl/albertheijn/article.jsp?trg=albertheijn/article.waarden.duurzaamheid.vissoort http://www.ah.nl/assortiment/article.jsp?trg=assortiment/article.ahduurzamevis http://www.ah.nl/albertheijn/article.jsp?trg=albertheijn/article.omv.duurzame-handel
EDEKA	http://www.edeka.de/EDEKA/Content/DE/ForYou/Eigenmarken/Fischerei/index.jsp
Kaufland	http://www.kaufland.de/Site/Unternehmen/Umweltarbeit/Nachhaltige_Fischerei/01_Fisch_bei_KL/index.htm
Aldi	http://www.aldi.co.uk/
Morrisons	http://www.morrisons.co.uk/Market-Street/Fishmonger1/Sustainable-fishing/
Carrefour (Cora)	ys: 10:26:31http://www.carrefour.com/cdc/responsible-commerce/our-commitment-to-the-environment/responsible-sourcing/
Auchan	http://www.groupe-auchan.com/index.jsp?lang=EN
Pingodoce	http://www.pingodoce.pt/
Delhaize	http://www.delhaize.be/food/thetaste/fish_goodforyou/_fr/fish_goodforyou.asp - ac
El Corte Ingles	http://www.elcorteinglescorporativo.es/elcorteinglescorporativo/elcorteinglescorporativo/index.jsp

6. Framework for the review

Questions in blue relate directly to points in the FAO guidelines for ecolabelling of marine capture fisheries or draft guidelines for aquaculture certification.

1	**Organisation/Scope/Facts (who are they?)**
a	What type of organisation is it?
b	What is the primary role of the organisation?
c	Is the primary role and intent of the organisation well communicated to the public?
d	Is there a website?
e	Is there active promotion of the organisation and the scheme beyond the website?
f	Are the purpose and standards of the scheme explained in detail?
g	Is the presentation easy to understand?
h	To whom is the organisation focussed on providing information?
i	What other activities is the organisation involved in? What are their main goals?
j	What proportion of the organisations time/budget is spent on supporting/running the scheme?
k	Does the organisation have similar schemes for non-fishery/aquaculture products?
l	Is the scheme one part of a broader advocacy effort?
m	Does the scheme develop standards for certification, including labelling of products (20)?
n	Does the scheme involve fisheries certification?
o	What are the objectives of the scheme, and has the organisation assessed performance against these objectives? If so, what was the outcome (19)?
p	Is the scheme voluntary and/or market-driven (3)?
q	What are the main countries where products covered by the scheme are marketed/sold?
r	What are the main countries where the fish covered by the scheme are sourced?
s	Is the scheme restricted by charter to certain countries?
2	**What does the scheme do?**
a	Are they species specific or can they be applied to all? Is the scheme concerned with capture fisheries?
b	Is the scheme concerned with aquaculture?
c	Is there an intention to expand into the other i.e. fisheries/aquaculture?
d	Is the scheme species specific or can it be applied to all species?
e	Are there any types of fisheries or aquaculture systems to which your scheme does not apply? If so, which types and why (5)?
f	Is there a limit to the number of fisheries or aquaculture systems that can be included in the scheme (6)?
g	If the scheme involves labelling, does the label make a specific claim, whether explicit or implicit (21)?
h	Does the scheme cover: Sustainable fish?
i	Does the scheme cover: Organic produce?
j	Does the scheme cover: Options good for health?
k	Does the scheme cover: Social criteria?
l	Does the scheme provide advice on a range of fisheries for businesses?
m	Does the scheme provide advice on a range of fisheries for consumers?
n	Does the scheme cover environmental criteria and if so, which ones?
o	Has the scheme's compliance and/or conformity with relevant national and international laws, regulations and agreements been checked? (1)
p	Describe how compliance of certified fisheries/aquaculture with relevant national and international laws, regulations and agreements is assessed (2)

3	**How does he scheme work?**
a	Does the scheme or the organisation define sustainability? If so, what is their definition?
b	On their website do they provide links to the sources of their information or other sites associated to sustainable fish sourcing/information?
c	Is their information referenced? Are they transparent about their data sources?
d	Describe how the standard setting procedures ensure transparency, avoidance of conflicts of interest and allow for participation by all interested parties; (4i)
e	What is the body responsible for accreditation of the certification bodies and how is its independence from the standard setting body ensured? (4ii)
f	Are the certification bodies in conformance with ISO Guide 65 requirements? If not, please describe how no conflicts of interest is ensured between the certification bodies and the standard setting body, and the requirements for transparency of certification procedures (e.g. clear/written procedures for handling applications, assessment process, availability of documents on request) (4iii)
g	How is credibility, accountability and transparency ensured throughout the scheme in accordance with international standards (e.g. ISO, CAC and WTO principles) (10)?
h	Are audits carried out on the following: - standard-setting body, accreditation body, certification bodies and certificate holders (i.e. fisheries, aquaculture producers, and chains of custody) (11)
i	With what frequency are audits carried out for each of the above? (12)
j	How does the scheme ensure that the best scientific evidence available is used in developing the standard? (16)
k	Is the information on which the certification/assessment/list based, from primary sources or do they use information from other schemes?
l	Does the scheme recognise equivalence with any other ecolabelling, certification or fish sustainability information schemes? (15)
m	How does the scheme ensure that the best scientific evidence available is used in assessing compliance with the standard? (17);
n	Does the scheme take into account traditional knowledge, and if so, how (18)?
p	Is appropriate information gathered i.e. all relevant issues are addressed?
q	Does your scheme recognise the special needs of developing countries (25)?
r	Has there been an assessment of compliance with the WTO agreement on Technical Barriers to Trade? Are the scheme owners aware of any issues related to potential obstacles to trade (9)?
s	Does the scheme cater for data-deficient fisheries?
t	Have any data deficient fisheries been assessed?
u	Describe the procedures for certification of small-scale and/or data-deficient fisheries or aquaculture producers (7)
v	Is the organisation passive (e.g. web posting) or active (e.g. holds stakeholder consultation meetings) in its role?
w	What other mechanisms are used to communicate the scheme's message and/or claims of sustainability (22)?
x	Does the process (certification/compilation of list) provide for consultation, peer review and formal challenge?
y	Have stakeholders contested the assessments due to accuracy problems?
z	Is there any evidence of the advice of certification bodies and/or the scheme changing after consultation?
aa	If no specific audits are carried out, how does the scheme receive and assess new information (14)?
bb	For **seafood guides**: How often is the list checked and up-dated? For **labelling schemes**: How often is re-certification carried out? What is the length of validity of a certificate for a fishery, aquaculture producer and/or chain of custody (13)?
cc	State the years from which the oldest and most recent information used in the assessment are taken.
dd	How does the scheme ensure traceability and integrity of supply of certified product from fishery/aquaculture producer to final point of sale (23)?

ee	For **seafood guides**, how does the scheme enable consumers to relate products in the shops/restaurants to information in the guide (e.g. traceability of species and/or source fishery) (24)?
3(i)	Questions relating to the standard & its application: **Fisheries** certification Schemes.
ff	In relation to the management system, do the scheme's criteria (and performance indicators) include an adequate assessment of the following (26):
	· The management system in place?
	· Whether the management system complies with relevant local, national and international law and regulations, including RFMOs?
	· The data collected, maintained and assessed for the evaluation of the current state and trends of the stocks?
	· Whether the management system/authorities adopt appropriate measures for the sustainable use of the stock under consideration, based on the data, information and scientific advice available?
	· The monitoring, control and surveillance systems for ensuring compliance with the regulations?
	· Whether and how the precautionary approach is implemented in management?
gg	In relation to the **stock under consideration**, do the scheme's criteria (and performance indicators) adequately assess (27):
	· The state of the stock under consideration?
	· Whether the stock is maintained at a level that promotes optimal utilisation, taking into account longer term changes in productivity?
	· Whether management measures would allow for restoration of the stocks within reasonable time frames, should the biomass drop below such levels?
hh	Would the scheme certify a stock that is classified as overfished (28)?
ii	In relation to the **ecosystem**, do the scheme's criteria (and performance indicators) adequately assess the most probable adverse impacts on the ecosystems, taking into account available scientific information and local knowledge (29)?
jj	Do the schemes criteria (and performance indicators) require that those impacts likely to have the most serious consequences are addressed adequately (e.g. through management response or further analysis) (30)?
3(ii)	Questions relating to the standard & its application: **Aquaculture** certification Schemes.
kk	In relation to **animal health and welfare,** do the scheme's criteria and performance indicators include an adequate assessment of the following (31):
	· Animal health and welfare measures in place?
	· The need to optimise the health of aquatic animals?
	· The need to minimise stress?
	· The reduction of aquatic animal disease risks?
	· The maintenance of a healthy culture environment?
	· The implementation of an animal health management process, including the health of animals from purchase through production to sale, and compliance with OIE and FAO Technical Guidelines?
	· The health of the culture environment for animals?
	· Whether drugs are only used as required and in the proper manner, and only approved drugs are used?
	· Whether the special needs of polyculture are addressed?
ll	In relation to **food safety and quality**, do the scheme's criteria and performance indicators include an adequate assessment of the following (32):
	· Whether food safety aspects (such as defined by FAO/WHO) are ensured?
	· Whether facilities are located in areas where the risk of contamination and pollution is minimised?
	· Whether there are satisfactory procedures to avoid contamination of feed?
	· Whether the broodstock do not carryover potential hazards to human health?
	· Whether monitoring of hazards (such as microbiological) and risks is carried out, such as for bivalve molluscs?
	· Whether the facility has a documented traceability and record-keeping system in place that includes all activities that impact food safety?

	· Whether good hygiene is maintained at the site, around the site, for inputs, handling, pests, equipment and at all stages during production?
mm	In relation to **environmental integrity**, do the scheme's criteria and performance indicators include an adequate assessment of the following (33):
	· The identification of the most likely environmental impacts, and the standard requires that the most likely environmental impacts are minimised?
	· Whether environmental impact assessments were carried out prior to approval of the aquaculture operation?
	· Whether environmental impacts are evaluated and mitigated and if so, how?
	· Whether the following environmental integrity risks are addressed:
	· Responsible use of water (efficient extraction and use) and responsible effluent management?
	· Responsible use of seed (use of hatchery seed where possible, and where wild seed is used, that it is collected using responsible practices)?
	· Responsible use of non-native species (should only be used where they pose low potential risk to the natural environment, biodiversity and ecosystem health) and minimisation of escapees?
	· Use of GMO ingredients that risk compromising biodiversity and human health?
	· Construction of facilities?
	· Use of feeds;
	· Use of energy.
nn	In relation to **social responsibility**, do the scheme's criteria and performance indicators include an adequate assessment of the following (34):
	· Whether development among rural communities is supported and small-scale producers are not marginalized?
	· Whether socio-economic, gender and generation issues (e.g. impacts on and opportunities for women and youth) have been considered at all stages of aquaculture planning, development and operation, in order to maximise benefits and minimise potential negative economic consequences?
	· Whether workers are treated responsibly within the national labour rules and regulations and international conventions such as ILO?
	· Whether child labour is used outside existing ILO conventions and standards?
	· Whether wages paid are in accordance with national rules and regulations?
oo	Does the scheme include special provisions to ensure the participation of resource-poor small-scale farmers, including in relation to the financial costs and benefits of participation (35)?
4	**What are the results?**
a	Does the scheme claim to result in environmental benefits?
b	Have any environmental benefits claimed been independently verified?
c	Does the scheme claim to result in economic benefits?
d	Have any economic benefits claimed been independently verified?
e	Does the scheme claim to result in social benefits?
f	Have any social benefits claimed been independently verified?
g	Does the label result in a price premium on the product compared to unlabelled (but otherwise similar) products?
h	Has the organisation taken any actions to alleviate consumer confusion between their 'brand' & others? & how serious in the issue perceived to be by them?
i	Has the organisation conducted any market research into whether consumers or any end-product users concerning the emergence of both fisheries & aquaculture standards on the same shelves?
5	**Organisational costs & funding**
a	What costs or charges may be incurred in using the services provided by the organisation? e.g. paying for the information, access to databases, certification fees, use of logo, promotional materials?
	Does the scheme have means to ensure that cost is not an obstacle to certification e.g. for small-scale fisheries or aquaculture systems? If so, how (8a)?
b	Does the scheme have means to ensure that cost is not an obstacle to accreditation of certifying

	bodies, e.g. for potential certifying bodies in developing countries? If so, how (8b)?
c	Who provides funding for the scheme?
d	What is the annual operating budget of the scheme?
e	Does the scheme have any contingency plans in the event of a downturn in subscription and/or a lesser role for certified products on the market?