SEAFISH
the authority on seafood

An investigation into the information requirements of businesses sourcing sustainable seafood

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Responsible sourcing guides survey: An investigation into the information requirements of businesses sourcing sustainable seafood

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Summary

Introduction

Although the production of the Seafish responsible sourcing guides were approved by the Seafish common language group and in general have been well received, there is very little knowledge of how they are used in practice. Updating and extending the guides is an ongoing cost which potentially could be use more effectively if we knew more about how guides are being used in business practice.

This survey aims to understand better how the guides are used by retailers and their seafood suppliers and how they would see Seafish developing its responsible sourcing service, possibly targeting information at consumers.

Survey design

This survey was aimed at was decision makers in who potentially used sustainability information in making buying decisions for seafood, or advised those making buying decisions, within commercial businesses in the UK. The list of respondents was drawn from the processor questionnaire (Brown 2008), those representing commercial businesses on the Seafish common language group and it's derivatives, the retail forum and those who had made enquiries to about sustainability issues to Seafish and finalists in the sustainable fish and chip shop of the year contest. A total of 22 persons were interviewed; 15 processors, importers or distributors 4 retailers and 3 restaurant/caterers out of a total of 113 persons on the list.

The questionnaire was structured firstly to establish the respondent's role in the Seafood market, then to elucidate their background principles, objectives and risk perceptions. It then asked for description of their sources of information on sustainablilty and standards At each stage there were structured and open ended questions. Information was sought on both wild caught and aquaculture sourced seafood product.

Results

The results of the survey are summarised below, for full details see Lart (2010)

Principles

There was majority agreement that ecological effects should be taken in to account when considering fisheries sustainability and that responsible sourcing should take into account an assessment of sustainability as well as the assurance of a legal catch. Most respondents agreed that fish can be responsibly sourced from a fishery where stocks are low, provided that managers and fishers took measures that should result in recovery, however there was minority disagreement.

The questionnaire also examined views on who should take responsibility for avoiding over use of fish stocks and what role they should take. There was a good degree of agreement that primary responsibility for fish stocks should rest with the fishing industry, governments and scientists, followed by fish processors and retailers in a supporting role. Acting responsibly within a legal framework were considered important roles. There was

recognition that cross-disciplinary partnerships and collaboration were a good approach and that sustainability was too important to be left to the market. The majority considered that consumers should not bear responsibility for fish stocks; consumers should be in a position not to have to worry about this aspect when buying fish.

Risks

Risk to reputation if stocks are not perceived as sustainable by the consumer and risk of fish shortage due to stock depletion, followed by risk of targeting by green campaigners were ranked as the highest risks relating to wild sourced seafood. This was followed by risk of damage to reputation if gear types were not perceived as ecologically sustainable by the consumer. Some were also concerned about investor confidence. There was not such a clear picture in relation to aquaculture risks; only that contamination of product appears to be perceived as a higher risk than for wild caught seafood. The main method used for countering these risks were formal and informal risk management systems and standards which could be used to draw on to communicate with consumers and investors. Diversification into sourcing different stocks in the case of wild caught seafood was also used as risk mitigation method. Other concepts of importance were forming links with non governmental organisations and effective use of public relations.

Stock status information requirements

Table 1 lists species and stocks which respondents requested further information on. Some of these are assessed species and others may be candidates for the Seafish risk based framework as proposed under the data deficient fisheries project.

Information sources

The respondents were asked about their current sources of sustainability information. A list of all the sources named is shown overleaf. The results are described in terms of information flow in Figure 1 and Figure 2. Processors used Seafish responsible sourcing guides mainly for informing customers and for background information, with some use in decision making. Retailers used these guides for decision making (particularly stocks which were not covered by Fishsource) and for background information relating to the environment and fisheries management and conservation.

Restaurants found the style of the guides not really suitable as information sources, but were very interested in visual material on responsible sourcing in the form of posters and leaflets to describe the concepts of responsible sourcing that could be used in fish and chip shops. Also ‘The Seafood Guide’ (Seafish 2009) and ‘The Good Catch Manual’ (Seafood Choices Alliance, Marine Conservation Society et al. 2010) style of publication appealed to this sector. For decision making the Marine Conservation Society (MCS) website, Fishonline found most favour with the restaurant sector.

Comparison between sources

In general, where there was information available and the respondent knew about the site, Fishsource was used for risk assessment for stocks which it covered. However, not all respondents knew about the site; 3 of the 15 processors none of the restaurants, and 3 the 4 retailers knew of Fishsource. This website uses a scoring system, which answers five questions quantitatively about each stock concerning stock health now and in future projections, on whether the management strategy is precautionary and whether scientific advice is followed. Seafish responsible sourcing guides describe the status of the stock in relation to the assessment reference points and the total allowable catch in relation to the scientific recommendation.

Fishsource currently majors on assessed stocks (although there are some for which there is less information) for which it is much easier to provide these metrics. Seafish responsible sourcing guides are available for both assessed and non-assessed stocks, and are valued by both processors and retailers for their background information on environment and

management. They are also used by the smaller processors as information sources for customers. In this role the concise nature of the guides is valued.

MCS Fishonline gives an overall recommendation of fish to avoid or fish to eat, and a 5 point rating scheme. Currently the larger retailers and processors use it in a supportive role to examine retailer or consumer sensitivity to a species or stock.

Recommendations

- The self contained, concise nature of the guides was valued for communication with customers and suppliers. It is recommended that the format of the guides remains substantially the same for this purpose.

- Presenting information which can be readily assimilated into the risk management systems should be useful in assisting information flow up and down the supply chain. It was suggested that the value of the guides could be enhanced by the setting up of a 'desktop' from which many sources of advice could be drawn on to assist decision making. A prototype of the tuna responsible sourcing guide based around this idea will be constructed when this guide is updated.

- The survey produced several suggestions for collaboration with other sources such as Fishsource, and these options should be explored

- The restaurant sector particularly fish and chips shops are more interested in visual media such as posters and leaflets to illustrate responsible sourcing. They use trade associations and magazines as important sources of information. It is recommended that these approaches are used in preparing information for this sector.

- For consumers, there are a variety of opinions expressed on the viability of Seafish informing this group. It is recommended that these and the rest of the report is made available to those with expertise in this field.

List of organisations and websites

All accessed September 2010

BRC British Retail Consortium www.brc.org.uk
CEFAS Centre for Environment, Fisheries and Aquaculture Science www.cefas.co.uk
CITES; Convention on Trade in Endangered Species of Wild Fauna and Flora www.cites.org
European Union; http://europa.eu/
FAO; Food and Agriculture Organisation of the United Nations www.fao.org
Fishbase www.fishbase.org
Friends of the Sea www.friendofthesea.org
Global Aquaculture Alliance (GAA) www.gaalliance.org
Global Good Agricultural Practice (GAP) www.globalgap.org
Greenpeace International www.greenpeace.org
Icelandic Marine Research Institute www.hafro.is
ICES; International Council for the Exploration of the Sea. www.ices.dk
Icelandic Government http://www.fisheries.is/
IUCN red list of threatened and endangered species www.iucnredlist.org/

Marine Conservation Society (MCS) www.mcsuk.org
Marine Conservation Society Fishonline www.fishonline.org
Marine Stewardship Council www.msc.org
Monterey Bay Aquarium (MBA) www.montereybayaquarium.org
Norwegian Government www.fisheries.no/
Responsible Fishing Scheme (RFS) http://rfs.seafish.org/
Responsible Icelandic Fisheries www.responsiblefisheries.is
Royal Forest and Bird Protection Society of New Zealand www.forestandbird.org.nz
Sea Fish Industry Authority; Seafish. www.seafish.org, www.seafish.org/b2b
Seafood Choices Alliance www.seafoodchoices.com
Sustainable Fisheries Partnership www.sustainablefish.org
Sustainable Fisheries Partnership; Fishsource
www.sustainablefish.org/main/fishsource
The Blue Ocean Institute www.blueocean.org/home
World Wide Fund for Nature www.wwf.org

Table 1 Stocks and species and groups of species on which the respondents desired further information

North Atlantic; Non assessed species turbot, dab, megrim, witch, skates and rays, dogfish, gurnards,. flounders, spider crabs, halibut, catfish (wolf fish) and redfish, Arctic char, tusk, silver smelt.
Tropical; swordfish, tunas, game fish, flying fish, snappers, grouper, reduction fisheries for prawn feeds, particularly in south east Asia.
Pacific; Alaska pollock from Russia, Chinese home waters stocks; for example Pacific cod.
Africa; kingclip (South African ling)
Aquaculture; salmon from aquaculture, Pangasius (river cobbler), yellowfin sole.

Figure 1 Responsible sourcing information flow for processors. Thickness of arrows approximately related to importance. Note main sources only, and certifiers ommited for clarity

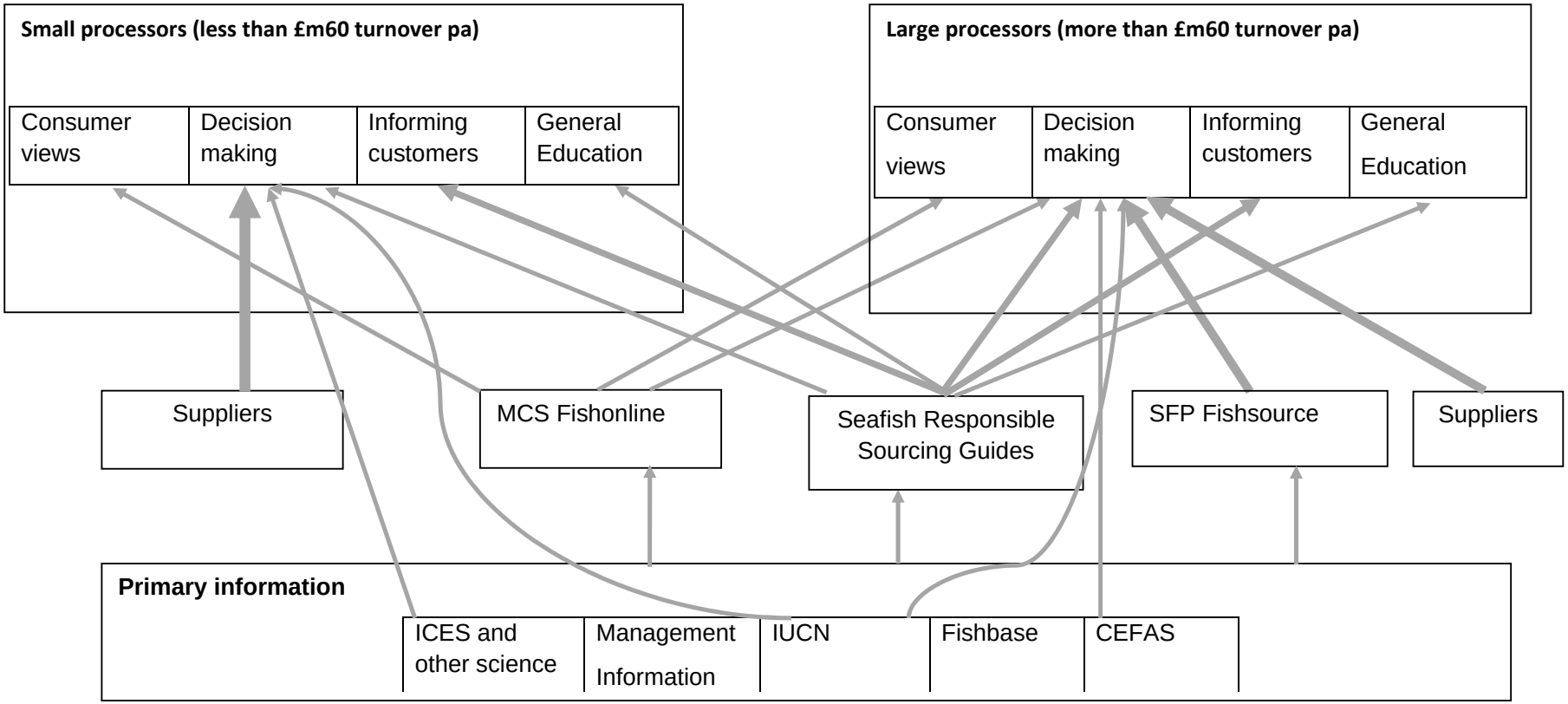
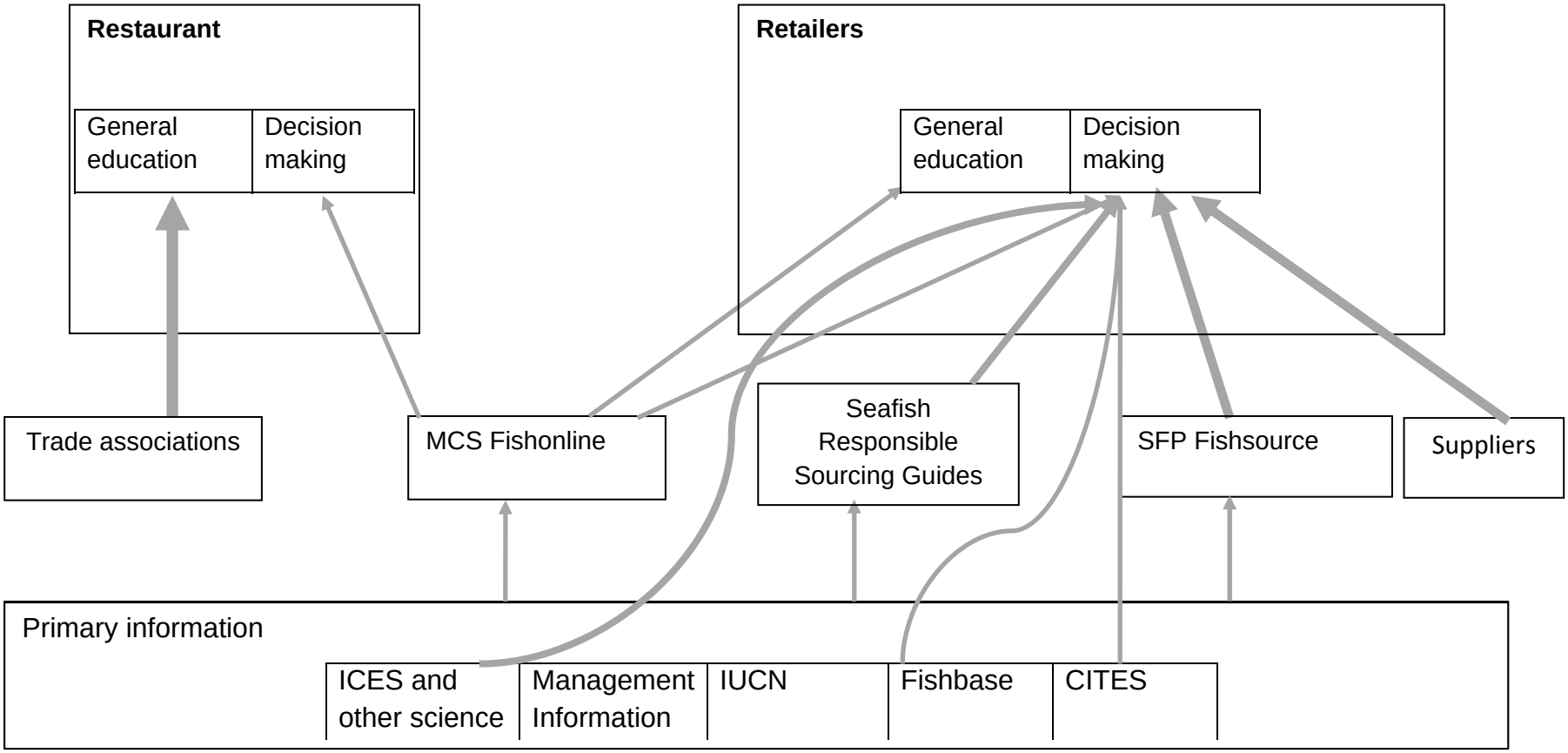


Figure 2 Responsible sourcing information flow for restaurents and retailers. Thickness of arrows approximately related to importancebut see text for discussion of qualitative differences between sources Note main sources only



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Seafish (2009). The Seafood Guide. Sea Fish Industry Authority, Grimsby

Seafood Choices Alliance, Marine Conservation Society, et al. (2010). The Good Catch Manual; A rough guide for chefs, restaurateurs and caterers, Seafood Choices Alliance.

Sheffield Hallam University

Faculty of ACES

An investigation into the information requirements of businesses sourcing sustainable seafood

by

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An investigation into the information requirements of businesses sourcing sustainable seafood

Summary

A survey of twenty two persons with responsibility for sourcing seafood within the UK processing, retailing and restaurant sectors. These personnel were known to have an interest in the sustainability aspects of seafood sourcing. Although the sample was small these people had considerable influence on the seafood market, accounting for a turnover of around £1000 million of seafood product per annum.

The questionnaire contained questions on their principles, objectives, perceived risks, information requirements and standards in relation to sustainability. The results are analysed to provide information useful to the future development of the Seafish responsible sourcing guides.

Reputation management was an important aspect of most of the respondents in relation to sustainable sourcing of seafood but they were also concerned about stock sustainability and ecological effects. The smaller processors tended to look towards fisheries current fisheries management to assure sustainability, whilst the larger processors and retailers used risk management systems to control sustainability risks.

A number of suggestions were made for the future development of the guides, including collaboration with other sources of information and enabling the viewing of different sources of information through one site. A number of recommendations are made for the future development of the Seafish responsible sourcing guides.

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1. Introduction

The Sea Fish Industry Authority (Seafish) is a statutory body set up by Act of UK Parliament in 1981 (Fisheries Act, 1981) for the purpose;

"……..of promoting the efficiency of the sea fish industry and so to serve the interests of the industry as a whole……..with regard to the interests of consumers of sea fish and sea fish products"

It is financed by a statutory levy of £9.03 per tonne on landings of sea fish in the United Kingdom. An important element Seafish's role is providing information to all parts of the seafood products supply chain. In recent years this has included information on sustainability of fisheries resources. This has lead to the production of the Seafish "responsible sourcing guides". These guides provide information on stock status and management of 25 species (or groups of species) accounting for around 65% by value of UK consumption of seafood. The objective of these guides is to provide the user with accurate, up to date and unbiased information which can be used to help make informed decisions regarding sustainability in the sourcing of seafood products. The guides are aimed at informed, corporate customers who make buying decisions for seafood within their businesses. Although the guides have been available and updated for 3 years there is very little qualitative or quantitative information available on their use by industry.

This project will use market survey techniques to gain a better understanding of the use of current information and information needs of seafood suppliers and retailers in relation to fisheries sustainability.

2. Background

Over recent years there has been public debate over the sustainable exploitation of fish stocks worldwide. Much of the debate centres on the sustainable exploitation of particular fish species such as blue fin tuna, Atlantic cod, skates and rays. Other issues are the ecological effects of fishing and the management systems used to prevent fish stock depletion and over fishing. The recent film by 'The End of the Line' produced by journalist Charles Clover has brought the issues to the public eye.

As a subject for public debate, sustainability of fisheries appears to be a recent phenomenon; one industry representative pointed to the protests held by Greenpeace outside supermarkets in October 2005, as a turning point. However, the science of fish stock assessment and the application of science to fisheries management through government and intergovernmental organisations have been evolving over most of the 20th and early 21st centuries.

A fish stock is a relatively self contained population of fish that is used as a fisheries management unit. The assessment aims to obtain the best growth out of the stock and avoid risks of stock depletion; that is risks of failure of the stock to reproduce adequately to support commercial harvesting. An evolving aspect of this science is the assessment of the effects of fishing on ecosystems and the balance of exploitation between fish stocks in multi species fisheries. Whilst great strides have been made in this field over the past 50 years (Payne, Cotter et al. 2008) there will always be gaps in our knowledge and uncertainty due to our inability to monitor and model all the variables.

Fisheries management is the process by which governments control fishing activities. It includes allocations of rights to fish, proscriptions of fishing methods and catch quantities, and amount of fishing permitted (fishing effort). The legal underpinning of international fisheries management originates in the United Nations Convention on the Law of the Sea in which was adopted on 10th Dec 1982 and came into force on 16th November 1996 (FAO 2005-2010) relating to the designation of 200 mile Exclusive Economic Zones and agreements concerning highly migratory straddling stocks such as tuna, which migrate

around whole oceans. Some of the fisheries on these stocks are managed by Regional Fisheries Management Organisations (RFMOs), which are international bodies some of which are under UN charter; there are also various Regional Fisheries Bodies which provide various levels of data collection and advice to their contracting parties (FAO 2008-2010)

Fisheries and aquaculture provide substantial opportunities for production of food and economic activity worldwide with a production of 115 million tonnes in 2008 (FAO Global Production Statistics). However, in spite of the substantial investment in science and management structures there is debate over the efficacy of fisheries science and management in avoiding excessive fishing resulting in stock depletion and environmental degradation. This is due to a variety of factors which vary between fisheries. Important issues include fisheries for mixed species where different species have different requirements for optimal harvesting within the same fisheries. North Sea cod is a good example, the mesh sizes and catch limits used are a compromise between the various white fish stocks (cod, haddock and whiting) exploited. Unfortunately, this means that cod can be severely overexploited whilst other species are optimally exploited. There are likely to be severe economic effects of closure of a fishery (although sometimes this has been deemed necessary; for example the Canadian cod fisheries (Lilly 2008)) so governments try to avoid closing mixed fisheries. The result can be discarding (returning to the sea dead) of undersized fish due to sub optimal gear selectivity or when restrictive quotas are fulfilled, which is wasteful and reduces the quality of the information available to scientists in their assessment of the stock because of the uncertain quantities discarded. Another important aspect is the common resource nature of fisheries. Although many fisheries are closely managed the fishermen are still in competition with each other for the fish. This leads to a ‘race to fish’ circumstance, in which a fisherman would find it difficult to use more selective gear which might put him at an operational disadvantage. Illegal, Unreported, and Unregulated fishing (IUU) is also a problem in some fisheries; regulating agencies cannot be everywhere. There are some nations which prosecute fisheries but which are not signed up to international management agreements so their fleets operate outside these agreements. Also, fisheries management measures have to be seen to be equitable; there is a social and economic

dimension particularly in remote areas where fisheries are an important source of employment.

A further issue is traceability. Fisheries management is based around stocks of fish. Different stocks of the same species may have different status yet labelling regulations may not require the stock to be identified. Therefore buyers may find it difficult to ascertain the status of the stock of origin.

In summary, fisheries management has features common with many other environmental management problems such as controlling greenhouse gas emissions or water resource management. Some examples include limited common resources, uncertainty, risk of overexploitation, competition between resource users, the need for international co-operation and difficulty in regulation. In aquaculture there are issues concerned with animal husbandry, ecological effects, utilisation of wild brood-stock and seedlings, food composition, energy use and waste management, social and economic criteria.

Advice and governance

For scientific advice on fisheries, governments rely on national and international research bodies which make scientific assessments of stocks; see Figure 1 for status of assessed stocks over the period since 1974. However, the advice is usually given as advice on a single stock basis. Scientists may advise closure of fishing on a single stock in a mixed fishery, and it is left to fisheries' managers (in Europe this means the Council of Fisheries Ministers) to decide what compromises to make between stocks. For this and sometimes political and economic reasons, fisheries' managers do not always follow scientific advice exactly as it is given. Instead, they may pursue a strategy that allows stocks to recover at different rates. This means that some stocks may remain depleted and legal fisheries remain on them with a plan which is intended to allow these depleted stocks to recover in the longer term. Also, for many fisheries and stocks, there is no scientific advice; these are described as information poor or data deficient stocks.

Evolution of Non statutory advice

These factors have been instrumental in the evolution of non statutory advice on fisheries from various environmental non governmental organisations (eNGOs). These sources of advice generally contain brief descriptions of stock status and in some cases a scoring system based on sustainability criteria; Table 2. They are reviewed in MRAG (2009) and Jacquet, Hocevar et al. (2009). It is known that advice and influence from these organisations has had an influence on the market for seafood particularly in the corporate sector, but the extent of this effect is unknown.

Responsible sourcing guides

In 2006 Seafish launched its own Seafish responsible sourcing guides which provide information on stock status and management of 25 species (or groups of species) accounting for around 65% by value of UK consumption of seafood. They are downloadable from the Seafish business to business website (Seafish 2010). The purpose of these guides is to give buyers background information on stock status and management and the main measures in place to protect the stock. They are aimed at corporate buyers, generally with a science background, but not necessarily in fisheries science.

The guides report stock status based upon the stock assessments' scientific criteria. There is no sustainability scoring system in the guides based on stock status and management effectiveness, which is a feature of some of the other guides. Management measures are reported and where the effectiveness these measures are known this is also reported. They are updated annually. An example is shown in Appendix I

Responsible Fishing Scheme

The Responsible Fishing Scheme (RFS) is a British Standards Institute Publically Available Statement (PAS) which describes good practice on board fishing vessels (Seafish 2010). The main thrust of this scheme covers practices which assure quality of catch, but there are aspects of environmental practice and crew training covered. Each boat has to go through an independent audit

procedure, for a fee, and there is a re-inspection every three years. The good practice guides are revised every two years.

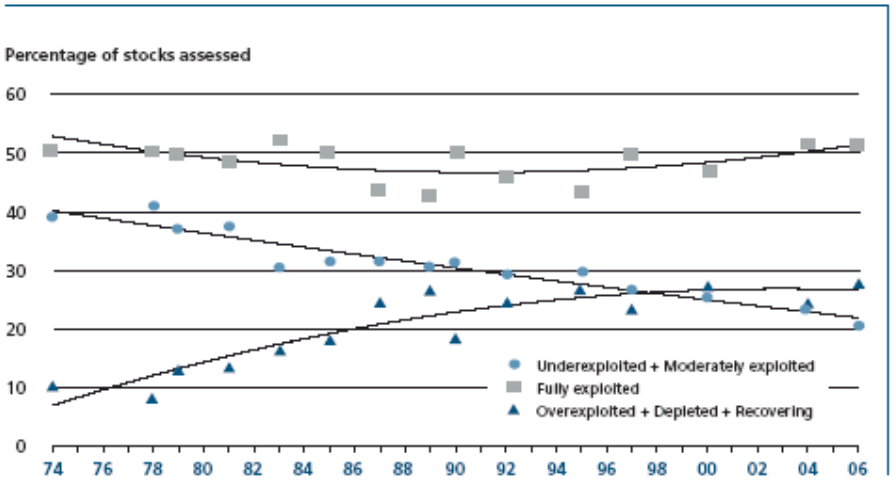


Figure 1 Global trends in the state of world marine fish stocks since 1974 Source FAO (2009)

3. Aims and Objectives

Although the production of the responsible sourcing guides and the initiation of the responsible fishing scheme were approved by Seafish inter disciplinary groups of stakeholders and in general have been well received, there is very little knowledge of how they are used in practice. Updating and extending the guides is an ongoing cost which potentially could be use more effectively if we knew more about how the background principles and objectives of the users and how the guides are being used.

This project aims to understand better how the guides are used by retailers and their seafood suppliers and how they would see Seafish developing its responsible sourcing service, possibly targeting information at consumers. The intention is to provide clear direction for the future development of responsible sourcing guides, including new species, consumer facing information and the content/format of the guides. This will help to position Seafish as a primary source of information on responsible sourcing. Also it is intended to gather information on the knowledge of and role of the Responsible Fishing Scheme in the supply chain, with a view to providing guidance for its further development.

The specific objective of this project is;

- To clarify the information needs of seafood suppliers and retailers; their perceptions of the main drivers; their levels of risk tolerance and use of current information in relation to the responsible sourcing of seafood.

4. Literature review

4.1. Seafood market

In a survey of the UK Seafood market in 2008 and an update in February 2009 Mintel (Mintel 2009) forecast continuing growth in the seafood market at around 3% per annum from £m 2,406 in 2010 to £m 2,787 in 2013. Historical market size was correlated with key economic and demographic determinants (independent variables) and forecasts of market size were made. The three most important determinants for seafood were:

Personal Disposable Income; This factor drives the ability to spend on all aspects of life, and in spite of the credit crunch the projections suggest a growth rate of 4% per annum in between 2007 and 2012. Whilst this figure was estimated a year or so ago it might be considered optimistic at the present time.

The other two major factors were the number of adults aged 55+ and the ABC1 (social groups) population. Both these factors are considered important because these are heavy consumers of fish and fisheries products and both social groups are expected to increase in numbers over the coming years. Mintel also predicts that the combination of health, convenience and recession will tend to benefit the frozen sector, and particularly fish fingers, fish cakes and frozen fish portion products.

Consumer attitudes

To understand UK consumer attitudes to the environment and seafood Seafish, Seafish (2005) undertook a study of consumer attitudes. Using 24 face to face interviews, a workshop session and 750, 15 minute in home interviews with seafood consumers, a picture was built up of the consumer typologies. These are described in Table 1. This table shows that whilst only 10% can be classified as ‘swimmers’; that is they were knowledgeable on environmental issues and attached great importance and effort to seeking further information.

Whilst ‘waders’ and ‘paddlers’ (making up a further 54% of the sample) expressed decreasing degrees of interest in environmental issues, they both expressed some regret at not being able to do more.

All typologies reported that the main motivating factor was that fish was perceived as a healthy option. The study reported some differences in consumer choice of Seafood with the ‘disinterested’ consumers being more likely to buy frozen processed product whereas the ‘waders’ and ‘swimmers’ reported more purchase of chilled, unprocessed and exotic fish. In a further study in 2007 (Seafish 2007) found that 75% of general consumers knew about sustainability and 22% act on it in their daily lives.

Worldwide consumer trends

Banks (2009) finds that product sustainability labels were most influential in Vietnam, Saudi Arabia and Brazil, India and Indonesia where around 80% of consumers indicated that labelling had an important or very important effect on purchasing. It was less important in European countries where around 50% of consumers in Poland, Norway, Netherlands, Finland, Estonia and Latvia indicated that sustainability labels were important in their choice of seafood. He finds that consumers consider that others should take responsibility for avoiding overuse of fish stocks, the most popular choice being governments. He identifies in four mega-trends in European consumers’ approach to choosing food;

1. Health/wellbeing
2. Ethical
3. Indulgence/pleasure
4. Convenience/practicality

Fish consumption appears to be increasing despite the recession and the supermarkets are dominant. Consumers appear to take more interest in sustainability labels outside Europe, and the consumer both in the UK and worldwide would rather see someone else take responsibility for avoiding overfishing.

Table 1 Consumer typologies from Seafish (2005)

Type of Consumer	Attitudes	Percentage
Swimmers	I attach great importance to environmental issues and behave in a way that is as environmentally responsible as possible, even if it means going that extra mile. I regularly read about / watch programmes about environmental issues and seek out further information in my own time out of personal interest.	10
Waders	Environmental issues do feature in my thinking and I try to do my bit, but find it too difficult to do as much as I could. I occasionally read about / watch programmes about environmental issues including those other than headline news, although I tend not to actively search for this information.	30
Paddlers	Environmental issues don't feature much in my thinking and I admit I do very little, but when I think about it, I sometimes feel guilty for not doing more. I rarely read about / watch programmes about environmental issues, but pay some attention to those that are headline news.	24
Disinterested	Environmental issues don't feature in my thinking, other things are more important, and I don't believe a single person can make a difference. I very rarely pay attention to environmental issues on the news or television.	18
Not allocated		18

4.2. Sustainable and responsible sourcing

It is important to examine the various threads relating to sustainability and responsible sourcing. Fish stock assessments rely on mathematical models of fish populations and arising from these models it is possible to define various levels of stock status. In the original definition of overfishing a stock was overfished when optimal growth was not being obtained from the stock because the fish were being removed at to high a rate, or the size at first capture was too small to allow fish to grow to their optimum size; that is the stocks are not being exploited at the maximum sustained yield (MSY).

However, stocks which are technically overfished by this definition can still be capable of reproducing and supporting a fishery. Since 1997 many stocks in the North East Atlantic (and to a certain extent in the North West Atlantic) have been assessed by ICES against a separate set of criteria which relate to the probability of the stock being able to adequately reproduce and support a fishery. These limits are termed 'Safe Biological Limits' (SBL); when a stock is outside these limits it is said to be depleted with a high risk of not being able to support a viable commercial fishery. There are also precautionary levels at which point stock assessors indicate that managers need to take some action to prevent the stock falling outside safe biological limits and becoming depleted; at this level there is usually a 5-10% risk of depletion. The concept of 'Safe Biological Limits' enables definition of depletion as well as optimum growth as defined above. Once stocks have recovered from depletion fisheries' managers may aim to optimise growth. In addition to man induced changes in fish stocks, most stocks are highly cyclical; they would vary in status with natural cycles.

These definitions are derived from assessments of stocks on a mathematical basis. In the strictest definition of sustainability, harvesting of current stocks should not jeopardise future yields, so stocks which are inside safe biological limits can be said to be 'sustainable'; see Figure 1. However, in the early 1990s FAO recognised that there was a need to set out principles and international standards of behaviour for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources with due respect for ecosystem and biodiversity. Hence the

development of the Code of Conduct for Responsible Fishing (FAO 1995) the standards derived from which are discussed in the next section.

4.2.1. Code of conduct for responsible fishing

The FAO have introduced a 'Code of Conduct for Responsible fishing' (FAO 1995). This document has articles defining good practice in all areas of fisheries and aquaculture, from fish capture to science and governance. The Code's principles include (Article 6.1);

> *"…….The right to fish carries with it the obligation to do so in a responsible manner so as to ensure effective conservation and management of the living aquatic resource."*

The Code is not compulsory; compliance is voluntary and it is aimed at all levels from the individual vessel to the government. Fisheries cannot be certified under the Code, but most standards for eco-labels (section 4.3) are derived in some way from the Code.

4.3. Market based schemes

Fundamentally these schemes are intended to influence the consumer towards purchasing fish from sources considered sustainable. They are reviewed by MRAG (2009) and Jacquet, Hocevar et al. (2009). These initiatives take a number of forms, such as product boycotts, sustainability guides which grade fish species or stocks according to sustainability criteria, eco-labelling schemes that can be used to certify fish as from a source which meets certain standards and enable the use of on pack eco-labels. A list of some of these schemes is shown in Table 2 for sustainability guides and Table 3 for standards based schemes. The sustainability guides take the form of publically available websites or booklets which contain lists or databases of fish stocks and fisheries containing sustainability information. Eco-labelling schemes cover such aspects as stock status, fisheries management and ecosystem effects. They are generally based around the FAO code of conduct for responsible fishing cited above in section 4.2.1. They require independent certifiers examining the assessment, management and environmental effects of a fishery. Fisheries are certified to time limited periods requiring re assessment at intervals. There are similar schemes covering aquaculture. There are 'chain of

custody' measures, which provide assurance that the fish being sold has actually originated from the certified fishery in question.

The efficacy of these schemes has been reviewed by Jacquet, Hocevar et al. (2009). They found two studies of the American market that showed that in spite of the distribution of 1 million seafood wallet cards from the Monterey Bay Aquarium, listing sustainability information on stocks, there had been no overall change in the American market and no reduction in fishing pressure on targeted stocks. In another study it was found that sustainable seafood campaigns increased awareness but produced no big changes in buying practices.

However, the situation in the UK is probably somewhat different. The targeting by Greenpeace of UK supermarkets 2005, and the subsequent ranking of the various supermarkets in terms of their fisheries' sustainability was targeted at the corporate sector rather than simply handing out leaflets to the general public.

Table 2 Sustainability Guides (MRAG 2009); see page 129 for websites

Organisation
Greenpeace International
World Wide Fund for Nature; International
Marine Conservation Society (MCS); Fishonline
Monterey Bay Aquarium
Sustainable Fisheries Partnership (Fishsource)

Table 3 Standards schemes (MRAG 2009); see page 129 for websites

Scheme
Marine Stewardship Council (MSC)
Friends of the Sea
Global Aquaculture Alliance (GAA) and Global GAP
Responsible Fishing Scheme

4.3.1. Supermarket policies

Of particular relevance to this study are the supermarkets' sustainable fish sourcing policies which are extracted from the Mintel report (Mintel 2009) and shown in Table **4**. The dominance of the Marine Conservation Society's fishonline website as a source of information and the ambition to achieve sourcing from Marine Stewardship Council's certified (accredited) fisheries are

important points. However, note also the mention of responsible sourcing and the responsible fishing scheme by two of the supermarkets Waitrose and Tesco. The reality of the situation is that much as the supermarkets would like to source from certified fisheries, not all fisheries are certified and so these buyers have to settle for other means of gauging sustainability, such as is available in the public domain from scientific, governmental and non-governmental sources.

Table 4 Supermarket policies on sustainable sourcing of fisheries products (Mintel 2009) MSC= Marine Stewardship Council, MCS = Marine Conservation Society

Supermarket	Policy
Waitrose	Tries to source from MSC accredited fisheries Delists threatened fish. Promotes responsible fishing Do not sell any fish from MCS List of Fish to Avoid. Sells the greatest number of fish from the MCS Fish to Eat List (26 species)
Marks & Spencer	Strongly committed to sustainability and have a reputation for only selling fish from responsibly managed fisheries Do not sell any fish from MCS List of Fish to Avoid
Tesco	Avoids stocking fish from vulnerable or over fished stocks. Supports sustainable sourcing initiatives such as the Responsible Fishing Scheme since July 08. Works with suppliers to improve fishing methods. Promotes sustainable fish species
Sainsbury's	Sourcing from sustainable fisheries. Ensuring responsible capture of fish Sourcing from MSC accredited fisheries where possible
Asda	Is working towards having all fish sold MSC accredited in the next 5 years.
Morrisons	Sources from sustainable fisheries and does not sell endangered species Do not sell any fish from MCS list of Fish to Avoid

4.4. Statistical techniques

In essence, this investigation is an examination of how business responds to environmental risks within its operating environment. The ingredients include scientific assessments, values and principles, risks relating to the natural environment and consumer demand.

The tools required for this purpose are very much within the field of social and market research; in this way there is a need to find tools which will examine attitudes and processes. Various authors have investigated attitudes and processes within the field of sustainability and environmental management. O'Dwyer, Underman et al. (2005) examines the views of a number of Irish non governmental organisation stakeholders in terms of how they perceive Corporate Social Disclosure in Irish business. For this purpose they used Likert attitudinal scales and ranking exercises. In an examination of sustainability constructs in coastal management Gallagher, Johnson et al. (2004) used very open ended questions to elucidate respondents understanding of sustainability issues. Ultimately business' response to environmental and sustainability pressures has to be placed within an operational framework; for example Leire and Mont (2010) looks at socially responsible purchasing, leading from policies, setting purchasing criteria, applying assurance practices and managing supplier relations and it is useful if these investigations are placed within a suitable operational framework; this is discussed in Section 5.1. Reviewed below are some the characteristics of Likert attitudinal scales, ranking exercises and qualitative approaches which have been used to examine these aspects.

Likert attitudinal scales

These scales are set up with a set of statements which are negatively or positively polarised. The results can then be analysed to examine the variability of the respondent's views along each of the scales from agreement to disagreement. To examine how much consensus there is in relation to the original constructs, a variety of techniques can be used; Illge and Schwarze (2009) used factor analysis (they called it cluster analysis) on the scored scales to examine two paradigms in environmental economics. Zou, Morris et al. (2009) used analysis of variance and multiple regression on the scores of the

scales to dissect out consensus from personal belief whilst O'Dwyer, Underman et al. (2005) used non parametric Mann-Whitney U tests to examine differences in response, between categories of respondents, on the grounds that responses are not necessarily normally distributed.

Analysis of ranks

Ranked responses have particular properties. Although respondents are being asked to rank their responses, there is no indication of the distance between the various responses. Therefore ranked data implies that the distributions of the parameters of interest in the populations are unknown; for one respondent the differences may be a long distance apart, whilst another they may be close together. This implies that specialised methods for analysis are required, since the distributions of ranked data are not expected to be normal.

Where the data are a fixed set of ordered response categories McCullagh and Nelder (1989) consider that the response can be described as polytomous; that is there are several choices of how to rank the items. This type of response can be analysed using specialised proportional odds and proportional hazards models. Whilst the analysis can only be applied under specialised circumstances the description of the data as a response-frequency table or bar chart is a useful tool.

Measures of association and correlation

There are various methods for analysing correlations between ranked responses, such as the Spearman's ranked correlation coefficient, which is can be thought of as equivalent to the Pearson product moment correlation which represents the proportion of variability accounted for (Statsoft 2010). For finding associations in ranked data the Kendall Coefficient of Concordance Kendall's τ ('tau') (Legendre 2005) is available. Grzegorzewski (2006) points out this coefficient is difficult to use when data are not fully comparable and proposes a modification to overcome this problem.

Qualitative techniques

Gallagher, Johnson et al. (2004) examined constructs of sustainability, related to underlying principles by requesting answers to relatively open ended questions, which were then coded by allocation of 'text units' using subjective judgement, to the ideas they represent. The number of each of these text units was then tabulated, enabling a ranked description of the relative importance of each of these ideas in the dataset. This technique enables key strands to be elucidated from open ended questions, and it is potentially a useful tool for examining common themes within all the qualitative comments within this survey. It has the disadvantage that coding is done post interview, and involves some judgement. However, in a field such as this it enables a researcher to incorporate ideas which were not in the original questions but were raised, by and are very much valid for the respondents. Other qualitative techniques include focus groups and other structured discussions. However, the responsible sourcing guides originated from discussions between stakeholders at Seafish organised meetings and the objective of this work was to explore the use of the guides by those for whom they were intended; fish retailers and their suppliers.

5. Materials and methods

This describes the questionnaire design process including outlining the framework for the questionnaire, evolving the questionnaire design via two drafts during the pilot survey and the final design of the questionnaire. The sampling strategy is described and the methods for administering the questionnaire.

5.1. Questionnaire design

There are a large number of techniques available for designing questionnaires to examine the attitudes and responses of business to sustainability issues. This survey was aimed at personnel who had at least some comprehension of the issues so it was legitimate to ask in depth questions with a high technical content. As a first step a framework within which to work should be set out and the available techniques discussed. In this case the following headings are appropriate:

Principles

In order to source fish, buyers would be expected have a set of attitudes to the fisheries management and sustainability which, even if they have not crystallised these into principles, would be expected to underpin their choice of seafood to source. How prepared are the respondents to follow the Non Governmental Organisations perceived approach of precaution? This could be tested using attitudinal scales technique, where a series of statements are given some of which are considered to be in favour of one attitude; precaution and the general eNGO line, and the other set to be bolder, and relate to a minimum of the bare legal requirements.

Another important influence on the buyers' principles is the way in which they see responsibility for fisheries governance in relation to the supply chain, and their own place in that chain. Banks (2009) examined consumer attitudes to responsibility in this issue, but he only asked consumers to name a single entity which the consumer thought should have responsibility for avoiding the overuse of fish stocks. In this survey it was of interest to find out where the respondents saw themselves in terms of responsibility for fish stocks, and how they

perceived others in the chain. Hence it was decided to ask respondents how they ranked their responsibilities and the responsibility of others for avoiding 'over use' of fish stocks. Also included was an option to add further entities. Tied ranks should be permitted because fisheries management is widely considered a collective responsibility. It was also of value to find out what role the respondents considered each entity should have in preventing overuse of fish stocks. The term 'over use' was used because it avoids entering a technical discussion of overfishing.

Risk perception and objectives

Objectives are the goals which are put in place to make the principles into reality. One would expect the objectives would be set, bearing in mind the principles, and to counter perceived risks. In this case the requirement is to understand the perception of which risks are considered important and what level of tolerance a buyer might have. In the abstract it is possible to consider asking what was considered to be a tolerable level of risk; that for example 10% chance of failure. However, the alternative is to consider relative risk levels by ranking possible risks. Also, it is important to allow the respondents scope to describe their own perceived risks and objectives.

Indicators and sources of information

Sources of information can be used to derive principles, describe risk and set up indicators and standards which buyers would adhere to when sourcing seafood. There is a need to gain information on the current use of information sources by the buyers and what they use the information for, and how important the relative importance of the various sources of information and the purpose to which it is put. Presentation is important so questions should include how the information is delivered. Since the Seafish responsible sourcing guides are the main source under discussion a detailed analysis of the use of these should be included and what features were favoured or otherwise by respondents. Several sources of information have scoring systems which are intended to give an indication of the sustainability of a stock or fishery, beyond what is available from the basic scientific and technical data. Open ended discussion of these aspects should be encouraged.

Standards

It is known that many respondents have statements of intent to source sustainable seafood, and also written standards behind these statements. When the standard is not so explicit or publically available there is a need to provide scope for obtaining information on this aspect. Also included should be scope for discussion of the Responsible Fishing Scheme.

Pilot questionnaires

The questionnaire was evolved through two pilots on two separate respondents; both small processors who were known to the author (they were in the sampling frame and would have been part of the sample). Both the questionnaires were filled out in the presence of the author; although the questionnaires were not described as pilots, it was obvious that work was needed on both of them. The two pilots with the responses on them are shown in Appendix II and III. The first pilot showed;

1. The statements in the Likert attitudinal scales elicited variable responses which was as expected, but there were probably too many of them

2. Ranking responsibilities was a meaningful approach, and produced results

3. Ranking risks was a meaningful but the concept of 'risk tolerance' that is if one was willing to accept for example a 10% risk of an event happening did not elicit a meaningful response.

4. The section on information sources needed more work to make it more concise and easy to fill out.

The questionnaire was too long and took too much time to administer, although it was not formally timed. Nevertheless the framework and style of the questionnaire appeared viable; it did need more refinement and a reasonable estimate of the time it would take to administer made.

The second pilot, which timed at 30 minutes to complete and is shown in Appendix II. The main findings of this pilot were;

1. Question 1 was too complicated and could be simplified with no loss of utility

2. Question 2 was superfluous and should be removed.

3. The Likert attitudinal scales in Question 3 produced responses at each end of the scale, but there were still too many of them; it would be better to give the respondents scope to express their own views. The format of question 3b worked well, particularly since it encouraged the respondent to decide whether a particular entity should have a role before they were ranked. There needed clarity that business views were being sort for both parts of question 3, and that question 3b was concerned with the future tense.

4. The Likert attitudinal scales in question 4 were not really necessary, but Question 5 was a good format to describe risks, but it required 'measures to reduce these risks' instead of comment, to be more effective. There also needed to be more scope for respondents to describe their own objectives.

5. The Likert attitudinal scales in question 6 were not a suitable way of asking about traceability and stock status, because in most cases respondents either would have this information or would not, it is not a matter of opinion.

6. Although question 6 concerned communication with the consumer rather than fisheries management in 3b, it was confusing because the two were similar.

7. Questions 8 and 9 were satisfactory, with some modifications; roles of the use of information from different organisations and prompts for names of organisations in Question 8 and tidying up of timeframes (use

of guides in the last 3 years) would help to make question 9 more specific.

8. Questions 10 and 11 yielded satisfactory information and remained unchanged in the final version

9. Questions 12 was trying to elucidate quantitative information when opinions of scoring systems should be a more qualitative approach.

10. Question 13, which asked about proportions of product produced under various standards simply lead to guessing how much product was sourced from responsible fishing scheme vessels; a more qualitative approach was required to elucidate opinions on the scheme.

Finally the second pilot questionnaire was evolved into the final questionnaire shown overleaf, which was used for the rest of the survey. Arguably more thought should have gone into the pilots which could have resulted in a more polished questionnaire earlier. However, it was clear that the framework; principles, objectives, indicators and standards was appropriate, but that what was required was to find means for respondents to adequately express their views on these matters and the best approach was to take the relatively 'raw' questionnaire to the respondents early in the process.

5.2. Final version of the questionnaire

The final version of the questionnaire was produced as shown overleaf. The attitudinal (Likert) scales were designed with scales were designed with a bi polar construct in mind; see section 6.3.1 page 54. The order of these statements was randomised; to avoid the risk of bias if all of one construct was presented first then the other entire construct was presented in a second batch (Devasagayam 1999).

Responsible Sourcing Survey

This questionnaire is targeted at fish buyers, processors and retailers (including foodservice) who have already contacted Seafish on responsible/sustainable sourcing issues or who had indicated an interest in sustainability from their response to the Seafish processor survey. The aim is to provide direction for the development of the responsible sourcing guides (www.seafish.org/b2b/rss) and possible further guides to inform consumers.

The objective is as folows;

1) To clarify the information needs of seafood suppliers and retailers; their perceptions of the main drivers; their levels of risk tolerance and use of current information in relation to the responsible sourcing of seafood.

Seafish has been producing information on the responsible sourcing of seafood including the Responsible Sourcing Guides for the past 3-4 years. There is also the Responsible Fishing Scheme and we (Seafish) would like to gain background knowledge of your views on responsible sourcing and how you obtain and use information on sustainability.

The results of the questionnaire will be treated anonimously; no participant will be identifieable in the final writeup. A report on the main findings will be available on completion of the project, and presentations will be made to the Seafish Common Language group.

This questionnaire is structured firstly to establish the respondent's role in the Seafood market, then to elucidate their background principles, objectives and risk perceptions. It then asks for information on their sources of information on sustainablilty and standards which they are working to already. At each stage there are structured and open ended questions.

We hope you will participate in this questionnaire and help Seafish improve its service in providing information on sustainability and responsible sourcing to the Seafood industry.

Thank You

Responsible Sourcing Questionnaire

Seafish would like to ask you your views on the responsible sourcing of seafood. Seafish has been producing information on the responsible sourcing of seafood including the Responsible Sourcing Guides for the past 3-4 years and there is also the Responsible Fishing Scheme and we (Seafish) would like to gain background knowledge of your views on responsible sourcing and how you obtain information on sustainability.

Name of respondent……

Appointment……No of Years in Fish industry…….

Organisation……

Date……

Interviewer……

The results of this questionnaire will be treated anonimously; no participants will be identifiable in the final writeup

1. **Establish the your business role in the Seafood market**

a. Turnover on Seafood products per annum

Tick box which apply

Turnover	
£0-£100,000	
£100,000-£1 million	
£1 million - £ 30 million	
£ 30 million - £ 60 million	
£ 60 million - £ 100 million	
£ 100 million +	

b. Wild caught species supplies

Approx. Percentage of turnover…….

c. Aquaculture species

Approx. Percentage of turnover……..

d. Type of business (tick box)

Primary processor	
Secondary processor	
Mixed processor	
Distributor	
Retail (monger)	
Retail (multiple)	
Pub and restaurent	
Fish and chips	

e. Products (see lists)

Product	**Tick if applicable**
Chilled unprocessed	
Chilled processed (filleted)	
Exotic fish	
Chilled meals	
Frozen processed	
Fish and Chips from fresh chilled	
Fish and Chips from frozen	
Others (please specify)	

2. Before going into detail, we would like to ask for your business views on a number of topics concerning fisheries sustainability**.** For each of the following statements please mark the rating category which most represents your business views;

	Strongly agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1. There is a need to take into account ecological effects when considering fisheries sustainability					
2. Non-Governmental Organisations (NGOs) have too great an influence over the market for fish					
3. Responsible sourcing should include an element of assessment of sustainability as well as assurance of a legal catch					
4. If a catch is legal, then it may be responsibly sourced; assessments of sustainability need not be included					
5. Even when stocks are low, fish may be responsibly sourced from a fishery if the managers and fishers behave in a way that will lead towards stock recovery					
6. The influence of NGOs is essential because they are independent of Government and industry					
7. The use of ratings is a convenient way of assessing fisheries sustainability					
8. The use of ratings can result in an over simplification of the situation of a fishery.					

3. In your business view, who in future should assume responsibility for ensuring fish stocks are not overused? And what role should they have? (1 is most important, ties are allowed)

Organisation	Yes/No	Rank	Role
The fishing industry			
Governments of countries			
Fish manufacturers and processors			
People who buy or eat fish; consumers			
Environmental Non-governmental organisations			
Multi stakeholder working groups such as the Seafish Common Language group			
Retailers of fish products			
Scientists			
Certifying bodies such as MSC			
Other(s) please specify			

4. Could you give us some indication of how you percieve the business risks attached to not taking sustainability factors into account when trading in Seafood? Please indicate those risks which you consider significant (answer Y/N) and rank the risks (1 is most important, ties are allowed; a Wild caught and b Aquaculture separately) and then descibe any measures which you use to reduce this risk.

a. Wild caught seafood risks	**Risk Y/N**	**Rank**	**Measures used to reduce risk**
Risk of damage to reputation if stocks are not percieved as sustainable by consumer			
Risk of damage to reputation if gear types are not percieved as ecologically sustainable by consumer			
Risk of fish shortage due to resource (stock) depletion			
Risk of loss of investor confidence			
Risk of wasting time and opportunity because of poor information on sustainability issues			
Risk of becoming a target for green campagners			
Risk of contaminated product Other risks			
Other risks			

b. Aquaculture risks	Risk Y/N	Rank	Measures used to reduce risk
Risk of damage to reputation through adverse ecological effects of aquaculture			
Risk of poor quality product			
Risk of contaminated product			
Risk of damage to reputation through adverse social and economic effects of aquaculture			
Risk of loss of investor confidence			
Risk of becoming a target for green campagners			
Risk of wasting time and opportunity because of poor information on sustainability issues			
Other aquaculture risks (please specify)			

5. Do you have any specific goals for sourcing of sustainable seafood?

6. To access information on sustainability you need to know which stock and fishery your fish is sourced from. Traceability systems are important in this regard.
    a. Please tick the situation which applies to your supplies;

1. Enough information on stock status	
2. Enough information on traceability	
3. Not enough information on stock status	
4. Not enough information on traceability to enable me to track stock status	
5. Enough information on traceability to enable me to track stock status	

    b. List the specific species and stocks which you require more information on

_____

_____

_____

    c. List any specific difficulties with traceability

_____

_____

_____

_

    d. Do your information systems on traceability, sustainability and stock status meet your expectations?

_____

_____

7. We would like information on the tools, mechanisms and information sources which you used to help you obtain information on sustainability.
   a. Please list your information sources and purpose to which you put the information, for example, purchase, sales, general background information, in ranked order of importance by purpose (1 is most important no ties) and any comments you have about the information.

Organisation	**Purpose and comment**	**Rank for purpose**

Prompts; Sustainable Fisheries Partnership, MCS fishonline, Seafish Responsible Sourcing Guides, Seafood Scotland, NOAA fishwatch, Greenpeace, WWF, Monteray Bay Aquarium, Seafood Choices Allance

   b. Do you have a specific person responsible for sustainability information? –

   _____

   c. Comments_____

8. Seafish would like to develop the Responsible Sourcing Guides to make them more useful to industry, we would like your views on the various parts of the guides, and on features on other guides which we could potentially incorporate.

a. Use of Responsible Sourcing Guides

Which Guides have you used in the past 3 years?	For what purpose

b. Rate information parts of guides; which features of the Responsible Sourcing Guides are most important to you? (Please rate the information – 1 = very useful, 5 = info is not very useful; ties allowed)

Feature	**Rate**	**Comment**
Introduction		
Buyers' top tips		
Stock status information		
Stock status tables		
Fisheries and Research		
Time series graphs (not all guides)		
Management and conservation		
Product characteristics		
References		

b. Please list any other aspects which you think should be in the guides

_____

_____

_____

c. Please list new species and groups of species you would like to see further information on

_____

d. Please list any other topics useful to responsible sourcing which you would like covered (information will include a list of fact sheets)

_____

_____

e. Please indicate your views on Seafish producing responsible sourcing information for the consumer

_____

_____

9. Various methods are available for delivery of information for responsible sourcing. We would like to be able to set priorities for Seafish. Please rank and comment on the following methods (1= highest; ties allowed)

Delivery	**Rank**	**Comment**
Online searchable database type information; look up species, stock and gear		
Fact sheet approach; as in Reasponsible Sourcing Guides		
Direct contact with specialist staff		
Other(s) please specify		

10. Seafish would like to gain understanding of your sourcing policy and the role of information sources and standards such as the responsible fishing scheme.

    a. Do you have a written policy on purchase of Seafood relating to sustainablity
       Yes
       No
       If yes is it publically available?
       Yes
       No

List the criteria used (if a written copy is available we can fill this in and send it back to you);

Criteria	
Do you specify that stocks should be inside Safe Biological Limits?	
Do you specify that fish should only be from certain gear types?	
Other limits	
Scores by MCS www.fishonline.org	
Scores by www.fishsource.org	
IUCN red list	
Others scores	
Aquaculture standards	
Other criteria Specify	

11. **Any other comments with particular reference to;**

a. Sustainability Scoring systems_____

_____

_____

_____

b. Responsible Fishing scheme http://rfs.seafish.org/_____

_____

_____

c. Other_____

_____

_____

_____

_____

_____

_____

5.3. Sampling strategy and outcome

The population which this questionnaire was aimed at was decision makers in who potentially used sustainability information in making buying decisions for seafood, or advised those making buying decisions, within commercial businesses in the UK. The sources of information for composing the sampling frame were;

1. The Seafish survey of the UK Seafood processing Industry 2008 (Brown 2008). This included a telephone survey of the whole UK Seafood industry carried out between March and September 2008 to estimate the population of businesses in the UK processed seafood and telephone surveys or emailed questionnaires of a sample of these businesses. Data from a total of 161 businesses out of a population of 456 (a response rate of 36%) were obtained. These data included financial, production and employment information. The survey asked about sustainability and environmental information and asked:

   Do sustainability issues affect the way in which you source raw materials?

   All 44 businesses who answered yes to this question were included in the sampling frame.

2. Seafish has several interdisciplinary groups which meet to discuss issues concerned with certain subject matter or sectors. The main group which considers sustainability and environmental issues is the Seafish common language group (intended to formulate a common language between the industry government and nongovernmental organisations). This has three sub groups, the skates and rays group, the UK scallop group and the retail forum. There is also the importers' forum; a subset of this was known to have an interest in sustainability issues. All those commercial businesses, that bought seafood, attending these groups were included in the sampling frame unless they were already on the list.

3. A log of all enquiries to Seafish has been kept since June 2007. All those requesting sustainability information between 1st June 2007 and 15th May 2010 were included in the sampling frame.

4. During June 2009 paper copies of the responsible sourcing guides were circulated to 47 leading seafood industry persons. If they were not already on the list and were in an appropriate role in their business were also added to the sampling frame.

5. For the fish and chip and catering sectors, lists of potential respondents were obtained from two specialist Seafish staff who worked in these fields. These included contestants in the 'Sustainable Fish and Chip shop of the year' and development chefs known to have an interest in sustainability.

This resulted in a list of 113 businesses, most of which had a named person to contact who was considered to be involved in purchase, or advising those who were purchasing Seafood.

5.3.1. Stratification

The sampling strategy and out come is described in Table 5. The initial weighting of the subsample was decided on the basis of their relative importance in the market place for Seafood. Multiple retailers are used by around 90% people who purchase fish (Banks 2009); so these together with distributers who supply many food service outlets were considered to be powerful players in the seafood market. Caterers and pub chains and restaurants were also considered important, so were weighted at around 50% of the stratum.

The processors were divided into three separate strata; smaller than 50 employees, larger than 50 employees, and a group described as 'major' processors known from other information to be important (data on the number of employees was not always present). Distributors were treated as a separate stratum at this stage, this group described businesses which were nationwide

but based outside Humberside. Importers were derived from the list of those involved in the Seafish importer forum.

The target samples for the rest of the strata were set at around 33% of the stratum or a minimum of 5 respondents, making 45 the target number of questionnaires. It became apparent quite early in the survey that this was too large a sample to achieve in the two months available to the survey. However, it was decided to progress with the survey as planned, but ensure that the strata were all sampled with the weighting originally planned. Therefore, when the time period was ended the sample was weighted as already planned, even though the number sampled may not have been as many as originally proposed. Also, for processors and importers it was clear that the best method of delivery was by face to face interviews so for these strata. Therefore for these strata, interviews were constrained to a cluster in the Humberside (Hull and Grimsby) area (postcodes HU and DN) area cluster, because of resource constraints. This is an important area for fish processing, and contains many of the large processors. For the other strata telephone and INTERWISE techniques were used exclusively (see below) so location was irrelevant.

5.3.2. Sub sampling

The planned approach was approach the businesses in random order within each stratum. The businesses were listed in their appropriate strata on an excel spreadsheet. Within each stratum the order of the businesses was randomised by the use of the randomise function on excel.

The business were then approached in the randomised order and attempts made to contact the person named on the list. If, after one or two repeat phone calls no contact had been made, or contact had been made but the interview refused attention was switched to the next on the list. This scheme worked well for the small and medium sized processors, with most within the cluster sampled, but less well for larger processors and retailers, who were short of time and sometimes had to be offered advice in exchange for interviews; sampling of these tended to be more opportunistic, although where it was planned to contact the whole stratum efforts were made to contact as many as feasible within the stratum. The two fish and chip shops sampled were the first

two on the randomised list, but sampling the caterers, pub chains and restaurants proved much more difficult. The person who was interviewed was a lecturer at a catering college, who also ran the college restaurant.

5.4. Delivery of the questionnaire

Each respondent filled out the questionnaire independently, although in some cases two people were present at the interview. The respondents were always warned that it was likely to take an 'hour plus' to complete the questionnaire. This resulted in some refusals, but it avoided half completed questionnaires and potential embarrassment. Two methods methods were used to deliver the questionnaire;

1. Face to face interviews with either the respondent or the interviewer filling out the questionnaire.

2. The use of the INTERWISE system which enables both parties to see the same file on their PC. Voice communication was by telephone (headphones and microphone can be used but were not in this survey). The interviewer would take the respondent through the questionnaire and type in the response as dictated. The interviewer would then send a copy of the file for checking and additional comment to the respondent. Where the INTERWISE system did not work the two parties read their own copies of the questionnaire and the interviewer filled out the questionnaire, sending an emailed copy to the respondent for checking.

In most cases the questionnaires were sent in advance by email so the respondents were forewarned of the questions. The process took around 1 hour and 20 minutes from start to finish with sometimes more time to load up the INTERWISE system. This was at considerable variance with the second, timed, pilot respondent who got through the longer second pilot questionnaire in 30 minutes. This shows that pilots can be misleading. It is a measure of the interest shown in the issues raised in the questionnaire that ultimately there was such a good response.

Two persons delivered the questionnaire. The author carried out 19 of the questionnaires including all of the INTERWISE interviews and the Seafish Humberside commercial team member carried out the other three. One of these elected to do the questionnaire without the interviewer present.

Table 5 Sampling strategy and out come

Stratum	Total on list	Planned Sample	Planned Sample proportion %	Number in HU and DN postcode cluster	Number approached	Non response	Final sample	Final sample proportion %
Fish and Chips	17	5	29		2	0	2	12
Caterers; Pub chain and restuarent	9	5	56		4	3	1	11
Retailers	8	8	100		7	3	4	50
Distributors	5	5	100		2	0	2	40
Processors 1- 50 employees	27	8	30	6	4	0	4	15
Processors 50+	19	5	26	5	5	2	3[1]	16
Importers	12	4	33	3	3	1	2	16
Major Processors	16	5	29	12	6	2	4	25
Totals	**113**	**45**					**22**	

[1] One of these was described as a distributer by the respondent

6. Results

6.1. Execution of questionnaire

A total of 22 questionnaires were completed, two of them pilots, the rest were the standard questionnaire. Of the standard questionnaires, five were partially complete, mostly concerned with question 11, the final question. Of the other questions question 7 was not always filled in as expected, with respondents reluctant to rank sources of information (see section 6.7). Information from the two pilot questionnaires was added to the analysis where possible.

6.2. Sample characteristics

The appointments of the respondents are described in Table 6. Of the 20 asked whether their organisation had a person responsible for sustainability information (question 7b) 15 replied that they had and that they were the main person for fisheries sustainability information, although in some cases others also had responsibility for other aspects of sustainability information and policy. The distribution of the period of time in the seafood business is shown in Figure 2; there is a considerable range in all sectors.

Table 7 shows the number of respondents reporting the various activities (question 1a). It is clear that several respondents reported more than one type of activity; several firms under take fish processing, importing and distributing or a combination of these three activities. For the purposes of this study all those undertaking these activities were considered part of one sector where appropriate; described as processors. The two fish and chip shops and the restaurant were analysed together as a “restaurant” sector, and the retailers as a separate sector, where these results were analysed separately.

Figure 3 shows the distribution of annual turnover in seafood product by sector. Taking the lower boundary in each case the total amount turned over by these businesses exceeds £1000 million. Some of this product is undoubtedly counted twice because some are customers of each other. Also some is exported, so is not relevant to the UK market, but sustainability concepts still apply. However, even allowing for this it seems likely that those questioned represent a substantial proportion of the estimated UK seafood market of around £ 2400 million per annum (see section 4.1). Figure 4 show the

distribution of the percentage wild caught by sector. The processing, importers and distributors and fish and chips sectors are clearly skewed towards wild caught product, whereas the retail and remaining restaurant use around 50:50 aquaculture and wild sourced product.

Figure 5 describes the diversity of products sold; as expected the retailers accounted for a large diversity of product, whilst the processors, importers and distributors concentrated on fresh and frozen processed product. These results are not weighted by turnover of product, simply by numbers of respondents dealing in each of the products.

The population which this questionnaire was aimed at was decision makers who potentially used sustainability information in making buying decisions for seafood, or advised those making buying decisions within commercial businesses (section 5.3). There were several constraints on the sampling process which will result in some degree of bias;

1. There were geographical constraints on the locations of the processors (though not distributors) sampled, only those within the Humberside area being interviewed. However, this area contains a very large concentration of the fish processing capacity in the UK with 12 out of the 16 major processors being located in this area.

2. There were obvious difficulties with sampling the catering sector, although the catering college lecturer interviewed was very knowledgeable on the subject, and was responsible for training a number of top chefs. The sampling of this sector and the major processors can be described as opportunistic rather than randomised within the stratum.

3. There were a number of non responses in all categories, some refusal, some simply the person requested was not contactable.

These are factors which must be considered when examining this survey. However, collectively those sampled constituted considerable turnover in seafood products; the estimate above is probably conservative. Given the

seniority of the respondents and their level of involvement it can be safely asserted that most had influence over buying strategy and decisions, if not being the major decision maker on sustainability in their organisation.

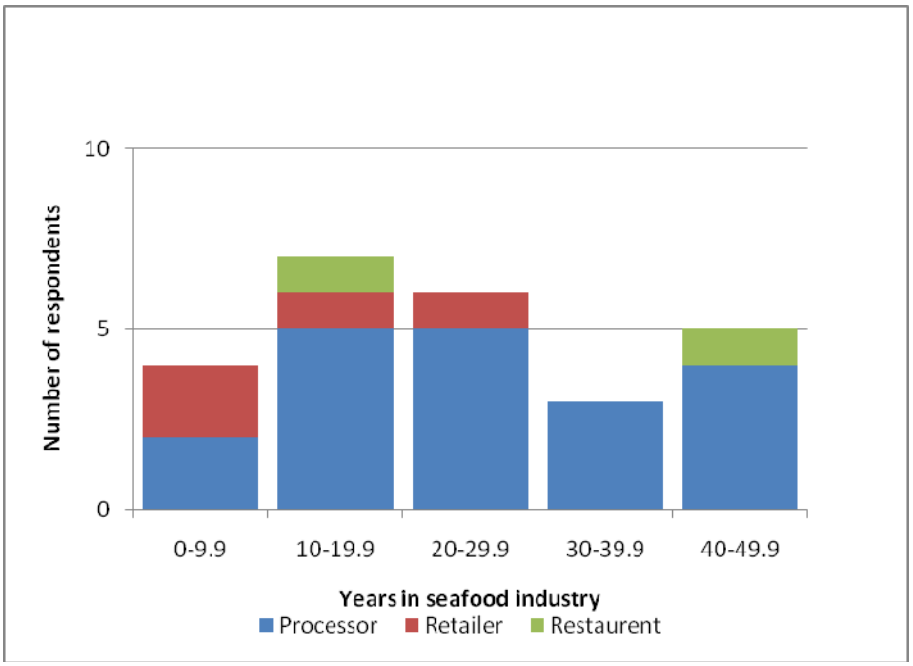


Figure 2 Number of respondents vis years in seafood industry (19 respondents)

Table 6 Appointments of respondents (22 respondents)

Appointment	Number of respondents
Director or owner	14
Technical manager	4
Specialist buyers	3
Lecturer in culinary arts	1

Table 7 Number of respondents reporting each activity, number of respondents= 22

Activity	Number of participants reporting activity
Primary processor	5
Secondary processor	3
Mixed processor	5
Distributor	5
Retail (multiple)	4
Pub and restaurant	0
Fish and chips	3
Catering college/Restaurant	1
Total	26

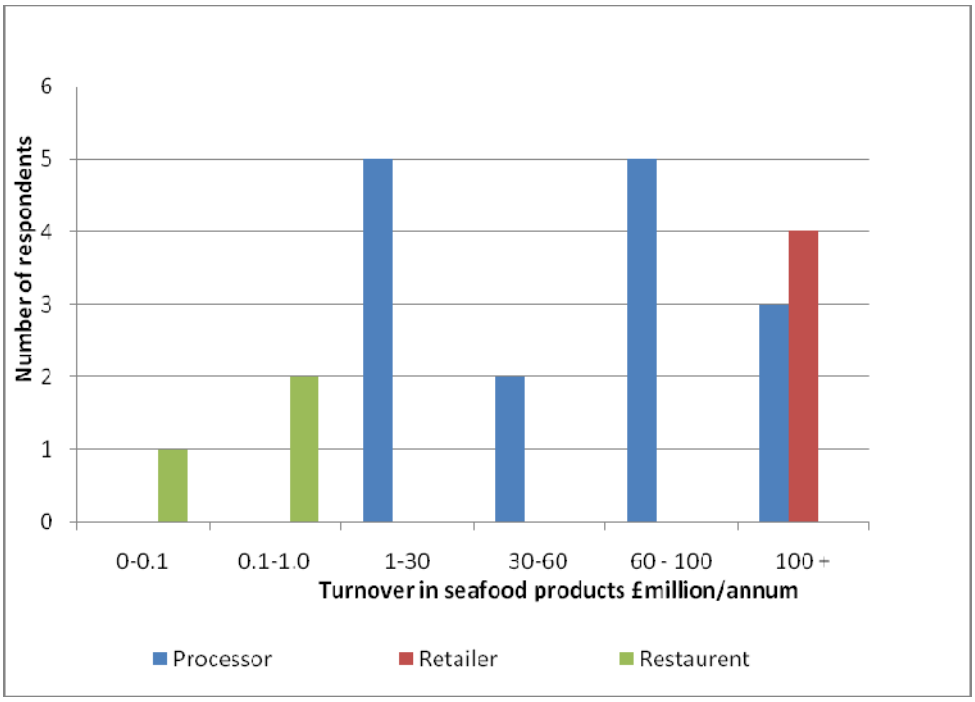


Figure 3 Distribution of annual turnover in seafood products by sector 22 respondents

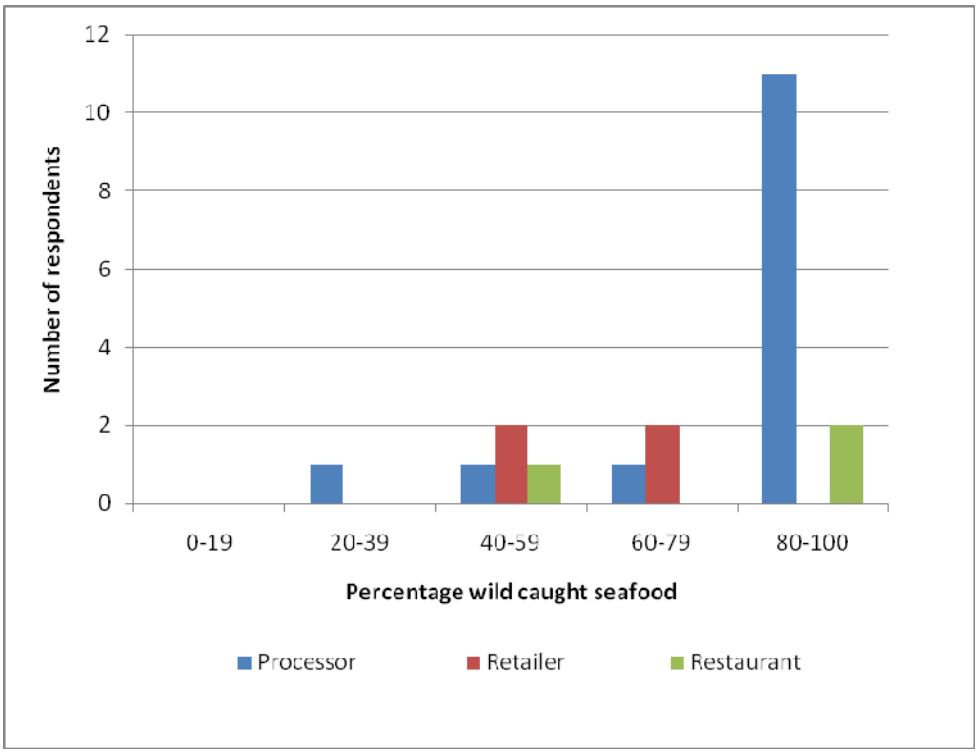


Figure 4 Distribution of percentage wild caught seafood by sector (21 respondents)

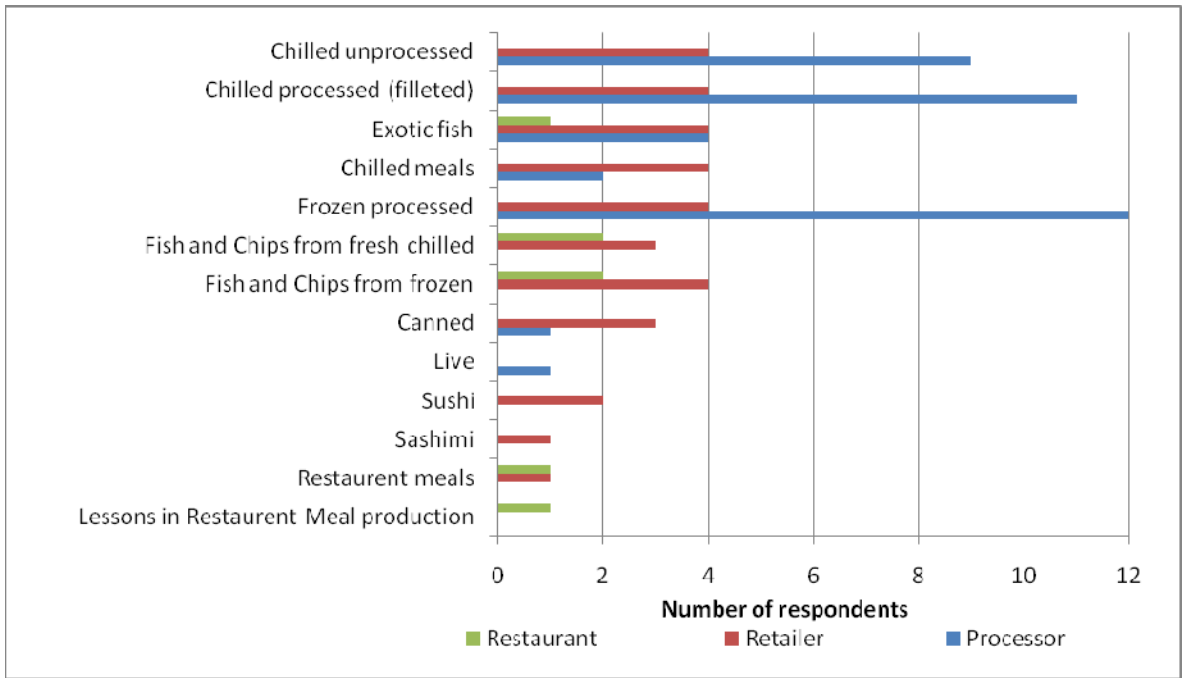


Figure 5 Distribution of products by sector (Notes; some retailers had fish and chips served in restaurants attached to stores, and the respondent from the catering college also ran a restaurant attached to the college) Number of respondents; 21

6.3. Principles

In this section, results from two questions one of which uses attitudinal scales and the other uses ranking of organisational responsibilities are analysed. The intention is to uncover underlying attitudes to fisheries management and hence guide our approach to communication with the constituency.

6.3.1. Attitudinal scales

The attitudinal scales were designed with a bi polar construct in mind. At one pole were statements agreement with which would be expected to be consistent with a precautionary, conservation minded approach. These are statements 1, 3, 6 and 7; shown green in Figure 6 and Figure 7. On the other pole are statements 2, 4, 5, and 8 shown blue in Figure 6 and Figure 7 agreement with which would indicate a more commercial approach which would only require basic fisheries management; assurance of a legal catch and not much influence of NGOs and opposition to ratings systems. Several of these statements, or similar ones, were investigated in the pilots and these were derived because they obtained a range of reaction from the respondents.

The results shown in Figure 6 and Figure 7 suggest good agreement between the respondents for statements 1, 3, 4 and 5, For all the statements 1,2 and 3 the respondents have tended to respond with a 'green' opinion, for statement 5 with a blue opinion, although there is disagreement in the responses to both statements 4 and 5 . For statements 2, 6, 7 and 8 which concern the roles of NGOs and the use of sustainability ratings there is more disagreement.

These plots form a useful basis for examining the degree of consensus or otherwise on individual statements, but they give less of a picture of the way in which individuals are behaving in relation to the whole set of statements. That is how the responses may be linked together in a set of attitudes. To do this correlations between the responses have to be examined. If correlations between the responses can be established, a technique known as 'factor analysis' may be applied to see if there are any hypothetical constructs corresponding to underlying attitudes that can be distilled from the data. In essence a large number of correlated variables are reduced to a small number of uncorrelated variables or 'factors' in a data simplification exercise.

Respondents can then be allocated a score based on these results and their location in relation to each other examined.

In this example we might look for one set of attitudes which were relatively sympathetic to the conservation movement (green statements) and another, second set of attitudes which take a more commercial approach (blue statements).

The first step is to establish whether there are any correlations between the responses. To score the results for each person's response to each statement, strong agreement was scored at +2, agreement at +1, neutral at 0, disagreement at -1, and strong disagreement at -2. This was the method adopted by Illge and Schwarze (2009).

Correlation matrix

A correlation matrix was constructed (using SPSS) comparing the scores for each statement and the results are shown in Table 8. Although significance levels were estimated they can only be considered indicative since the distributions may not have been normal. Correlations were found for the following statements;

- Statements 2 and 6 are negatively correlated; this accords with the construct; those in favour of NGO influence are likely to be in favour of statement 6 but against statement 2.

- Statements 3 and 4 are negatively correlated; this also accords with the construct; agreement with statement 3 implies more than basic legal catch as a sustainability indicator, whereas agreement with statement 4 implies only a legal catch as an indicator of sustainability, this can be discerned in Figure 6.

- Statement 6 and 4 are negatively correlated; this accords with the construct; agreeing that NGOs are an essential independent voice would

implies a belief that industry should do more than the minimum assurance of a legal catch.

- The positive correlation between statements 1 and 3 is in accord with the construct; both these are conservation minded or 'green' statements.

- Statement 5 is not correlated with any of the other statements; however although the subject matter is clearly related to the other statements; it does not have a good opposing statement.

However, the responses for statements 7 and 8 are confused; although they are in a sense opposite there is no significant negative correlation between them. Therefore statements 7 and 8 are probably best left out of further analysis because they are probably confusing and not really testing the original construct.

Factor Analysis

An examination of the data on statements 1 to 6 for factor analysis was run on SPSS. Initially Bartlett's test was run to see whether there were any correlations between the six statements, the results are shown Table 9. Since the chi squared test indicates high significance then correlations between the variabiles exist (which has already been established above) so factors are possible.

The KMO measure of sampling adequacy (MSA) is also shown overall for the 6 variables in Table 9. This examines the proportion of partial correlations to correlation between the variables.

If factors are present the idea is that the partial correlations should not be too high; implying that correlations are between the variables contributing to the factors, and not to residual correlations with other variables.

Kaiser and Rice (1974) give a scale against which to judge the MSA;

MSA measure	Scale
=>0.9	Marvellous
0.8+	Meritorious
0.7+	Middling
0.6+	Mediocre
0.5+	Miserable
<0.5	Unacceptable

On this scale a MSA of 0.575 can be regarded as in the miserable range. Therefore the MSA of the individual statements was examined to ascertain whether any could be removed with benefit. Table 10 shows that statement 5 is in the lowest category and so it was removed before further analysis; statement 6 was just outside 'miserable' but was left in.

The resulting overall MSA was 0.61 (Table 11) which is just within the mediocre category and Bartlett's test suggested that factors were still present; a so factor analysis proceeded with these variables. The results are shown in Table 12, Table 13, Table 14, and Figure 8 and Figure 9.

Extraction with two factors (Table 13) accounts for 65% of the variance and the scree plot of the eigen values (proportional to explained variance) indicates a two factor solution. This is because factors 1 and 2 correspond to eigen values of around 2.2 and 1.6 respectively indicating that they account for more variation than factors 3, 4 and 5 (Figure 8). However, only two of the statements, statements 1 and 3 are close together on the factor plot in Figure 9, the others being a considerable distance apart. Therefore, there are no coherent factors detected. Although there are correlations between responses, the statements are not grouping on the factor plot in a coherent manner.

Summary

There is evidence of consensus on some statements, and that the respondents are consistently reacting in favour of some statements and against others which in opposition; statements 3 and 4 for example. However, these are insufficent to form a set of factors from which overall attitudes could be examined.

Statement 1

There is a need to take into account ecological effects when considering fisheries sustainability

Statement 2

Non-Governmental Organisations (NGOs) have too great an influence over the market for fish

Statement 3

Responsible sourcing should include an element of assessment of sustainability as well as assurance of a legal catch

Statement 4

If a catch is legal, then it may be responsibly sourced; assessments of sustainability need not be included

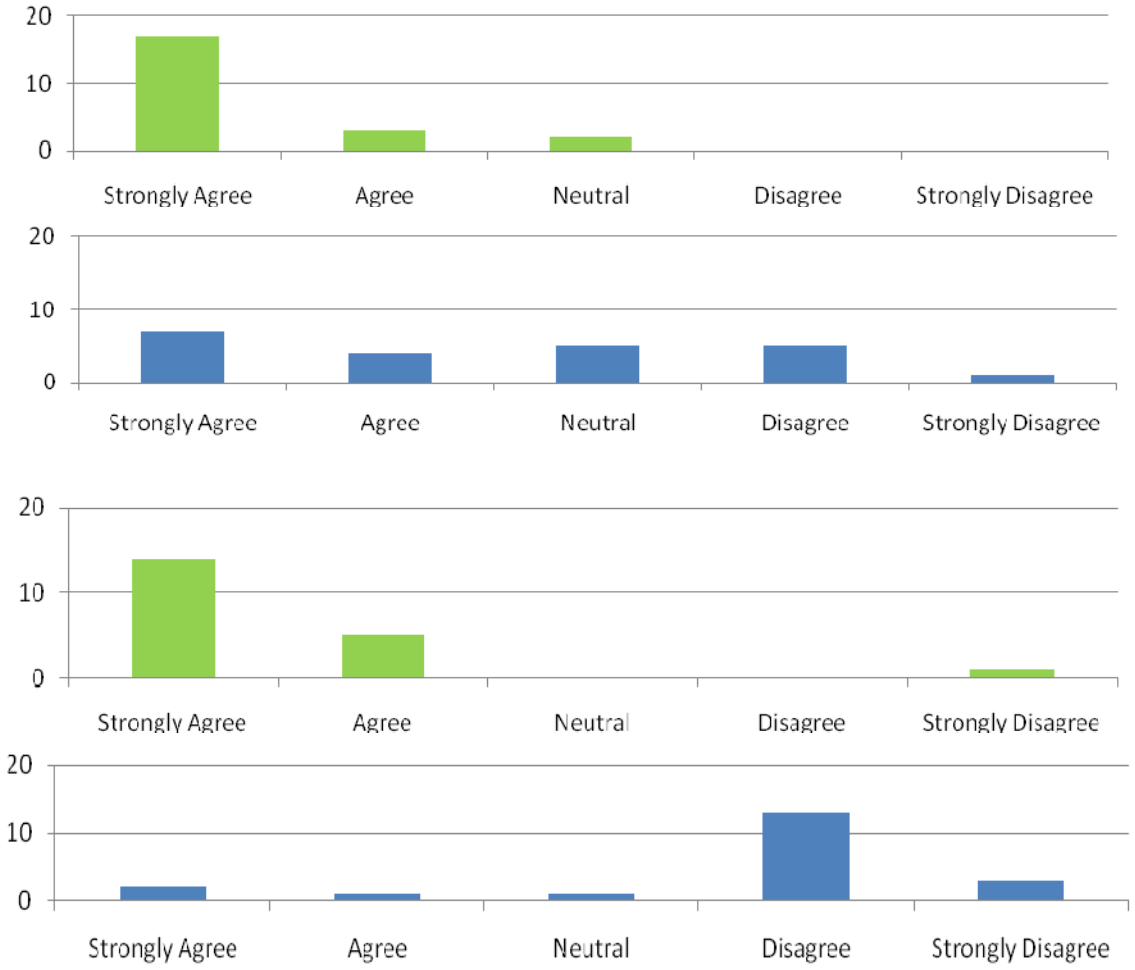
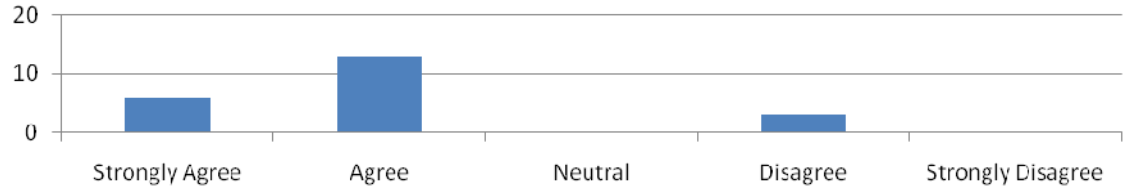


Figure 6 Question 2; Number of respondents (Y axis) vis responses (X axis) for statements 1 to 4; see text for explanation of colours

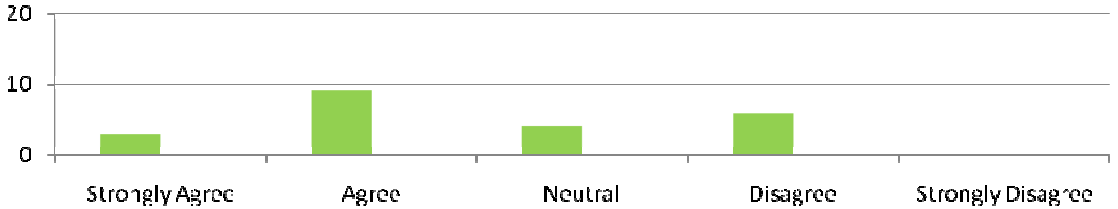
Statement 5

Even when stocks are low, fish may be responsibly sourced from a fishery if the managers and fishers behave in a way that will lead towards stock recovery



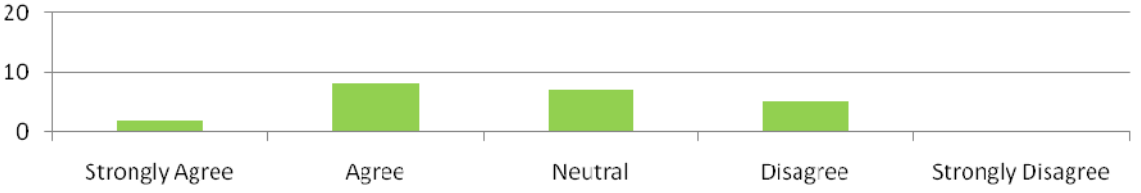
Statement 6

The influence of NGOs is essential because they are independent of Government and industry



Statement 7

The use of ratings is a convenient way of assessing fisheries sustainability



Statement 8

The use of ratings can result in an over simplification of the situation of a fishery.

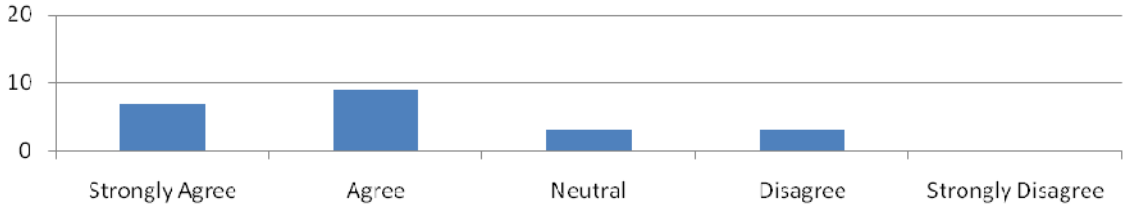


Figure 7 Question 2; Number of respondents (Y axis) vis responses (X axis) for statements 5 to 8; see text for explanation of colours

Table 8 Correlation coefficient matrix (SPSS) for comparison between response scores for each of the statements. Each coefficient compares 20 responses

Statement_1	Pearson Correlation	1.000							
	Sig. (2-tailed)								
Statement_2	Pearson Correlation	.283	1.000						
	Sig. (2-tailed)	.227							
Statement_3	Pearson Correlation	.759**	.373	1.000					
	Sig. (2-tailed)	.000	.105						
Statement_4	Pearson Correlation	-.466*	.033	-.493*	1.000				
	Sig. (2-tailed)	.038	.890	.027					
Statement_5	Pearson Correlation	.177	.147	-.029	.114	1.000			
	Sig. (2-tailed)	.455	.536	.902	.634				
Statement_6	Pearson Correlation	.072	-.451*	-.084	-.388	-.137	1.000		
	Sig. (2-tailed)	.763	.046	.726	.091	.565			
Statement_7	Pearson Correlation	.243	-.054	.408	-.247	-.286	.300	1.000	
	Sig. (2-tailed)	.303	.822	.074	.294	.222	.199		
Statement_8	Pearson Correlation	.299	.321	.508*	-.274	-.222	.033	-.208	1.000
	Sig. (2-tailed)	.200	.167	.022	.243	.346	.890	.378	
		Statement_1	Statement_2	Statement_3	Statement_4	Statement_5	Statement_6	Statement_7	Statement_8

*Correlations significant at the 0.05 level (2-tailed) **Correlations significant at the 0.01% level (2-tailed)

Table 9 KMO and Bartlett's test for sphericity for statements 1 to 6

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.575
Bartlett's Test of Sphericity	Approx. Chi-Square	32.838
	df	15.000
	Sig.	.005

Table 10 Kaiser's Measure of Sampling Adequacy (MSA) for the individual statements (from SPSS)

Statement	Measure of Sampling Adequacy:
1	0.587
2	0.687
3	0.561
4	0.682
5	0.287
6	0.473

Table 11 KMO and Bartlett's test for sphericity for statements 1, 2, 3, 4 and 6.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.610
Bartlett's Test of Sphericity	Approx. Chi-Square	30.835
	df	10.000
	Sig.	.001

Table 12 Communalities for statements 1 – 4 and 6

Communalities[a]

	Initial	Extraction
Statement_1	.601	.656
Statement_2	.327	.364
Statement_3	.661	.908
Statement_4	.433	.486
Statement_6	.381	.854

Extraction Method: Maximum Likelihood.

a. One or more communalitiy estimates greater than 1 were encountered during iterations. The resulting solution should be interpreted with caution.

Table 13 Total variance explained

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.277	45.535	45.535	1.971	39.412	39.412
2	1.616	32.320	77.854	1.297	25.939	65.351
3	.476	9.516	87.371			
4	.423	8.463	95.834			
5	.208	4.166	100.000			

Extraction Method: Maximum Likelihood.

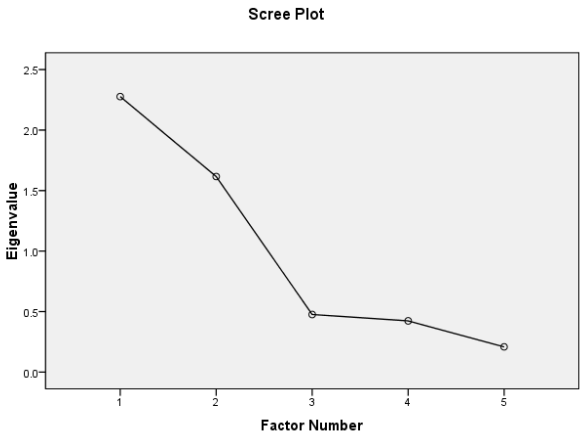


Figure 8 Eigen values vis factor number for statements 1-4 and 6

Table 14 Factor matrix for 2 factors extracted

Factor Matrix[a]

	Factor	
	1	2
Statement_1	.796	.149
Statement_2	.398	-.453
Statement_3	.953	.003
Statement_4	-.512	-.473
Statement_6	-.089	.920

Extraction Method: Maximum Likelihood.

a. 2 factors extracted. 20 iterations required.

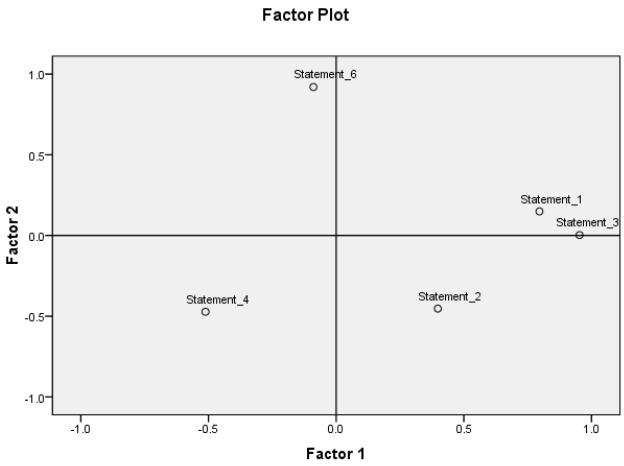


Figure 9 Factor plot for statements 1 to 4 and 6

6.3.2. Ranking of responsibilities

In this analysis it is intended to examine the degree of consensus which the respondents held in terms of who should be responsible for avoiding fish stocks becoming depleted or overfished. The term 'over use' was used in order to avoid diversion into technical discussions of the definition of overfishing.

The enquiry centred on who they think (in their business view) should have responsibility for managing fisheries and what roles the various entities should perform. The approach chosen was to ask the respondents to rank entities in terms of their responsibility. Inevitably, as fisheries are common resources, people perceive that there should be some scope for collaboration between entities, equally there should be means for the respondents to exclude entities they did not think should be responsible.

Therefore it was decided to allow respondent to firstly choose who out of a range of entities (some were organisations such as government, others could be better described as sectors or groups of people, for the purpose of this analysis they are termed 'entities') they thought should be responsible for avoiding over use of fish stocks and then rank the entities which they considered should be responsible. Ties were permitted, so that the respondents could express equal responsibility of stakeholders for fisheries management.

Ranking data has particular problems for statistical analysis (section 4.4 page 18). When the ranking is clear cut and based on physical measurement and there are no missing values it is relatively easy to see how it may be analysed and presented. In this case there are three choices being made by each respondent;

1. Whether to rank at all; should the entity have any responsibility at all for fisheries?

2. Also should other entities not on the list have responsibility?

3. How to rank the entries.

The respondents were asked to describe what role the entities should have in preventing the over use of fish stock. The challenge for this analysis is to describe the collective results of the respondents to interpret them in terms of the principles they could reveal.

Coefficient of concordance

As discussed in section 4.4 there are several statistics for examining ranked data. However, most are unsuitable for these data because of the existence of tied and unranked data in the data set. Grzegorzewski (2006) recognises this problem and has designed the coefficient of concordance claimed to be equivalent to Kendall's coefficient of concordance for use in these circumstances; see Appendix IV.

The main precondition for calculating this coefficient is that at least one of the observers has unequivocally ranked the objects under consideration. This condition was fulfilled for these data. The worked example in Grzegorzewski's paper was first carried out to test the method. Then the concordance coefficient was calculated from these data for 21 respondents;

Coefficient of concordance = 0.722

From Neave (1978) Kendall's $\mathbf{T}_{(n=21,\ \alpha = 0.2\%)} = 0.486$

Thus provided the Kendall's **T** is a valid statistic for this coefficient there is a high probability of agreement between the respondents in the order in which they ranked these entities.

Ranking of responsibilities

In analysing tied data there is a requirement to ensure that each respondent's ranks are arranged on the same scale. This can be achieved by scoring each datum consistently. For example a set of ranks containing ties should be scored as follows;

Raw ranks	1	2	2	2	3	4	5	6	7	7	9
Scored ranks	1	3	3	3	5	6	7	8	7.5	7.5	9

This scoring was carried out for all the respondents' results individually; those entities not ranked were placed in the category not ranked. The additional entities included by some respondents were also noted and are described below although they were not included in this process.

The scored ranks for each entity were grouped into three bands =<3, >3 =<6 and >6=<9, effectively high, medium and low risk bands and those classified as not ranked. The number of respondents whose scored ranks for each of these entities fell into each band was counted. The results are shown as bar charts in Figure 10 and Figure 11. The three sectors are keyed on these bar charts so that can be examined where respondents from each sector perceive themselves in terms of responsibility.

The fishing industry, governments of countries and scientists were most frequently ranked in the top three. Fish manufacturers and processors and retailers tied in terms of being most frequently ranked in the next three places although slightly more fish processors than retailers were ranked more often in the top three. Some respondents from both retailers and processors ranked themselves in the top three. For multi stakeholder working groups, certifying bodies such as MSC and environmental nongovernmental organisations the distributions were very similar. However, consumers were most frequently allocated to the not ranked category.

Other organisations

The following other entities were suggested by respondents as entities which should be responsible for avoiding the overuse of fish stocks:

- Fisheries improvement partnerships; this is a recognised approach involving a multi disciplinary approach to improving fisheries management and managing issues.

- Seafish was suggested by one processor as an organisation which should take responsibility as a bridge between industry, science and government.

- International government was included by two respondents; one proposed that such entities should implement strict Scandinavian style fisheries management.

- Trade magazines and other media**,** were another entity which were identified by a person from the restaurant sector. Communication was an important theme of this sector.

- Anglers were identified by one processor as an entity which should take more responsibility for quantifying their catches.

Roles

Each respondent was asked to briefly describe the roles which they thought each of their ranked entities should adopt in relation to responsibility for avoiding overuse of fish stocks. Each entry was then coded into one of 21 roles and the counts of these entities against the coded roles shown in Table 15. The main roles are described below.

- **Fishing industry;** the main theme was that this sector should act responsibly with consideration for the whole industry implementing responsible sourcing and traceability. They should feed accurate

information to decision makers and collaborate for best practice. Ownership and guardianship of the resource were also important themes.

- **Governments** were perceived as important in setting and enforcing the legal framework and promoting collaboration for best practice in fisheries management.

- **Scientists'** role was seen as providing accurate information, advice and independent assessments.

- **Fish processors** were recognised as having an important role in responsible sourcing; providing correct information, traceability and using influence to improve practice.

- **Retailers** were recognised for their important role in the market to source seafood product responsibly and communicate with customers.

- **Multi stakeholder working groups such as the Seafish common language group** were considered to be important in communication.

- **Certifying bodies'** role was defined as setting a robust standard, but they should also publicise that standard.

- There was clear consensus that the role of **environmental nongovernmental organisations** was that of taking an independent view and providing guidance. However, there was comment that Seafish involvement with this sector was important and that a balanced approach was needed.

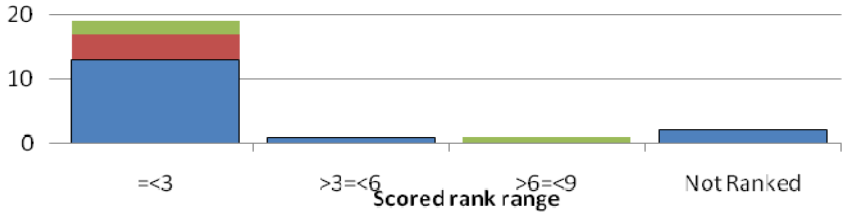
- Although not many ranked **consumers,** those that did recognised that they should become informed and act responsibly in their purchasing.

Summary

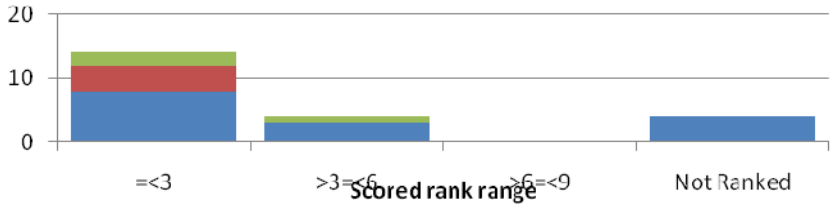
The respondents placed the primary responsibility on the fishing industry, government and scientists to prevent fish stocks being overused. They recognised the important roles of processors and retailers in responsible

sourcing, influence and communication, and the supporting roles of other entities. Collaboration through government and influence, responsibility, communication and an adequate legal framework were seen as important concepts.

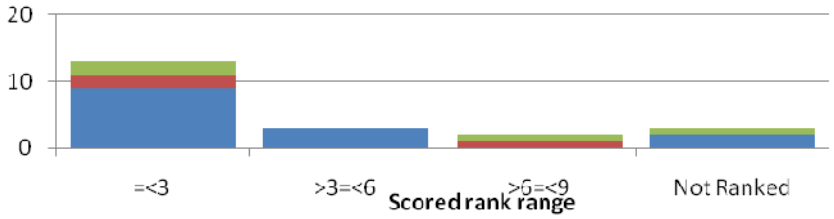
The fishing industry



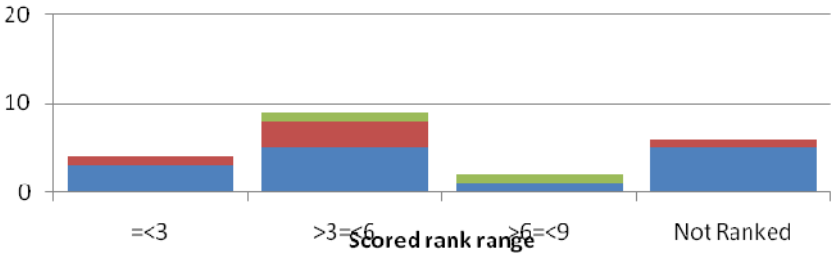
Governments of countries



Scientists



Fish manufacturers and processors



Retailers of fish products

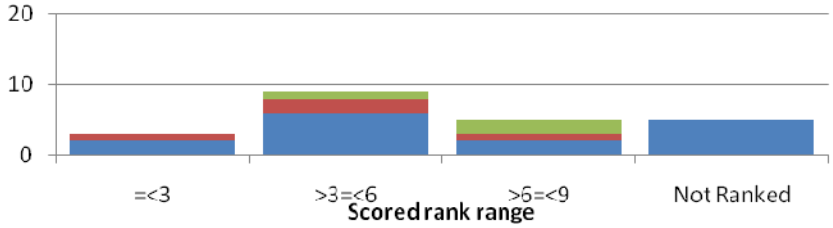
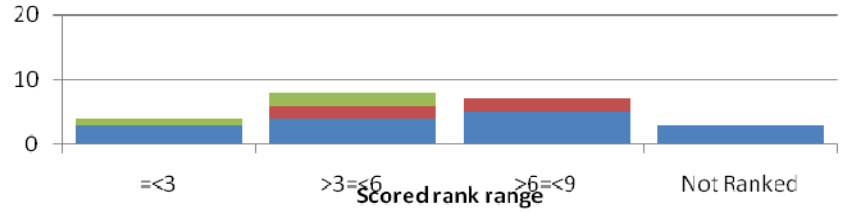


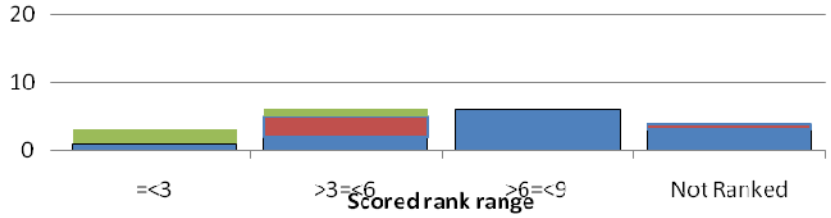
Figure 10 Question 3 Number of respondents (Y axis) vis scored rank (X axis) by entity 21 respondents Keyed;

Processors **Retailers** **Restaurants**

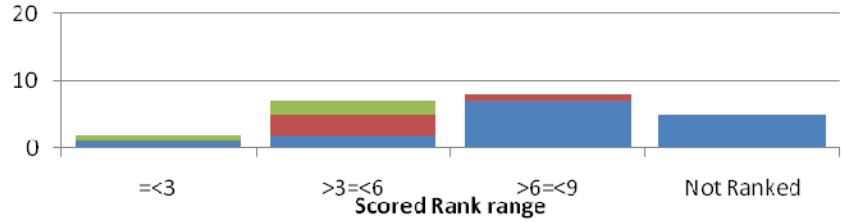
Multi-stakeholder working groups such as the Seafish common language group



Certifying bodies such as MSC



Environmental non governmental organisations



People who buy and eat fish; consumers

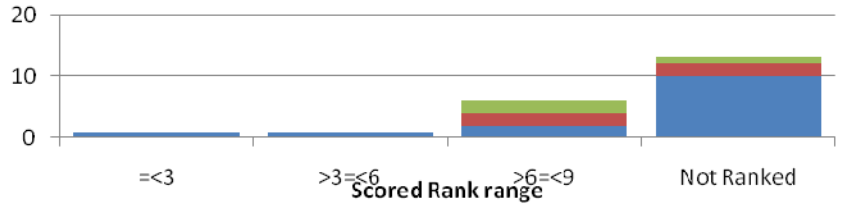


Figure 11 Question 3; Number of respondents (Y axis) vis scored rank range (X axis) by entity 21 respondents

Keyed by sector:

Processors **Retailers** **Restaurants**

Table 15 (continued overleaf) Coded roles vis entities (organisations or groups), number of respondents indicating each role (21 respondents)

Role	The fishing industry	Governments	Scientists	Fish processors	Retailers	Multi stakeholder working groups	Certifying bodies such as MSC	Environmental Non-governmental organisations	Consumers
Act responsibly to whole industry, responsible sourcing, traceability	6	2	1	6	2	2	2	1	4
Feed correct, accurate information	4		9	3			2	1	
Collaborate, with others, for best practice in fisheries management	3	6	2	1	2	1	1		
Ranked, but role not assigned a role	1	1	1	1	1	2	2	6	1
Advice; independent assessment			6			4	2	1	
Act within a legal framework, ensure rules are obeyed	1	8		1	1				
Independent view; guidance; conscience						2		10	
Should recognise important role in market; responsibly source and communicate with customers					9				
Set robust standard							6		

Role	The fishing industry	Governments	Scientists	Fish processors	Retailers	Multi stakeholder working groups	Certifying bodies such as MSC	Environmental Non-governmental organisations	Consumers
Common language and communication						4			
Take ownership of fisheries and guard the resource	3	1							
Use influence; to improve practice				3	1				
Need a balanced approach						2		1	
Become informed of issues									2
Important Seafish Involvement						1		1	
Publicise certified products							2		
Societal and industry values		1				1			
Take scientific advice and look to future	2								
Consider ecosystem effects fishery							1		
Should be realistic					1				
Should choose a diversity of fish									1
Voluntary Governance; go beyond basics							1		
Voice of some								1	

6.4. Objectives

Analysis of the pilot interviews lead to the recognition that the pilot questionnaire was potentially too highly structured to allow the respondents a free hand to express their aspirations and objectives for sustainable sourcing of seafood. Therefore it was decided to include the question;

'Do you have any specific goals for the sourcing of sustainable seafood?'

with sufficient space to allow the respondents to express their ideas. This resulted in varying amounts of information from the respondents. There is the risk that these data would be difficult to interpret because of the variable quantity of the response. However, careful analysis and coding enabled useful information to be obtained. Information elicited in this way has the advantage that the respondents are freed from the restraints of answering pre-decided questions and can express their own views.

Preliminary inspection of these data showed that there were very clear differences between the three sectors, processors as one sector, retailers and restaurants as separate sectors. The coded list of objectives for processors is shown in Table 16. It became clear that the types of objectives tended to vary with size of the business. Smaller processors tended to have relatively simple objectives when compared with larger ones, as might be expected. Table 17 shows how the larger processors tended to have more complex compounded objectives. Whilst smaller processors tend to either do as their customers ask or rely on the current fisheries management regimes, the larger ones tend to take a proactive approach the issues, making reference to their own ambitions for structured assessments and/or certification. This is not surprising, but must be caveat must be added that this is a small sample (3 participants did not answer this question). The main division appears to occur at around £m60 turnover per annum.

Table 18 and Table 19 show the coded objectives for the retailers and restaurant sectors respectively. These show that the retailers are clearly in

favour of making structured assessments, whilst the restaurant sector focuses on communication, although the nearly all have secondary objectives.

Table 16 Classifies objectives of the processor respondents' coded objectives

Classification for Table 17	Coded objective
1	Do what our customers ask only, no more
2	Only buy products with a track record of sustainability
3	Improve fisheries management
4	Fisheries management should result in a consistent catch of fish; sustainability is difficult to define because of variability in the environment
5	The fisheries management system where we source our fish results in sustainability; we would consider this a market leader
6	To make structured assessment of fisheries to categorise sustainability against a set of criteria, ensure that supplied fish meet these criteria
7	Make more product certified through Marine Stewardship Council and others as appropriate available through our business
8	Manage issues, through engagement

Table 17 Combination of objectives of processors by turnover in seafood products; number of respondents 12.

	Turnover in seafood products (£ million)			
Objectives (classification from above in brackets)	**1 - 30**	**30 - 60**	**60- 100**	**100+**
Do what our customers ask, no more (1)	1			
Buy from fisheries with a track record of sustainability (2)	1		1	
Rely on and/or improve current fisheries management (3,4,5)	1	1	2	
Structured assessments (6)			1	
Structured assessment and aim for an increase in MSC or other certification (6,7)			1	1
Aim for an increase in MSC or other certification and rely on and/or improve fisheries management (5,7)		1		
Structured assessments and managing issues through engagement (6,8)				1

Table 18 Combinations of objectives of the 4 retailers

Objective 1	Objective 2	Objective 3
To make structured assessment of fisheries to categorise sustainability against a set of criteria, ensure that supplied fish meet these criteria	Make more product certified through Marine Stewardship Council and others as appropriate available through our business	Improve feedstuff sustainability in aquaculture
To make structured assessment of fisheries to categorise sustainability against a set of criteria, ensure that supplied fish meet these criteria	Source from Responsible Fishing Scheme vessels where possible	
To make structured assessment of fisheries to categorise sustainability against a set of criteria, ensure that supplied fish meet these criteria	Source from Responsible Fishing Scheme vessels where possible	
To make structured assessment of fisheries to categorise sustainability against a set of criteria, ensure that supplied fish meet these criteria		

Table 19 Combination of objectives of restaurants

Objective 1	Objective 2	Objective 3
Be informed on sustainability issues and share information with suppliers and customers, and others in the trade through education and information	Make more product certified through Marine Stewardship Council available through our business	
Be informed on sustainability issues and share information with suppliers and customers, and others in the trade through education and information	Only buy products with a track record of sustainability	
Be informed on sustainability issues and share information with suppliers and customers, and others in the trade through education and information	Improve feedstuff sustainability in aquaculture products supplied through my business	Ethical dimension; respect the animal slaughtered and avoid waste. Food provenance is becoming an important issue.

6.5. Risks

This analysis examines the results from question 4 concerning perception of the risks perceived by the respondents in sourcing of both wild caught and aquaculture seafood products and measures taken to reduce those risks.

Not everyone is going to consider all risks on the list as applying to their business so it is reasonable to ask respondents to select which risks to rank. Also it is difficult to list every possible risk in the questionnaire so respondents were asked to risk any further risks. Some risks are perceived as consequential on other risks and potentially perceived as the same level of risk; hence the requirement to allow ties. This created the same statistical difficulties as discussed in 6.3.2 and the same approach was adopted. The ranks were scored use of scored ranks as described in section 6.3.2 and where feasible the coefficient of concordance calculated using the method described by Grzegorzewski (2006). The respondents were also asked to describe measures which they take took reduce risks. These were coded into 16 risks for wild caught seafood and 11 for aquaculture sourced seafood and are shown in Table 20 for wild caught seafood and Table 21 for aquaculture sourced seafood.

6.5.1. Wild caught seafood supply risks

The coefficient of concordance was calculated for these data (see Appendix IV) and Grzegorzewski (2006)) and found to be;

Coefficient of concordance = 0.747

From Neave (1978) Kendall's $T_{(n=21,\ \alpha = 0.2\%)} = 0.486$

Thus provided the Kendall's T is a valid statistic for this coefficient as is claimed by Grzegorzewski (2006) , there is a high probability of agreement between the respondents in t he order in which they ranked these risks.

The scored ranks for each risk were grouped into three bands =<2.5, >2.5 =<4.5 and >4.5=<7, (note these were scored ranks, hence a score of 2.5 would be obtained when two risks were ranked at 2), effectively high, medium and low

risk bands and those classified as not ranked. The number of respondents whose scored ranks for each of these risks fell into each band was counted. The results are shown as bar charts in Figure 12 and Figure 13.

These results show that the majority of the respondents most frequently ranked damage to reputation if fish stocks are not perceived as sustainable by consumers, fish stock depletion and the risk of targeting by green campaigners in the highest category of risk. However, some respondents did not consider targeting by green campaigners to be a risk. Risk of damage to reputation in relation to consumer perception of gear types most frequently allocated to the medium category by the respondents. Of those who ranked the loss of investor confidence the majority allocated it to the middle category, but an equal number did not consider this to be a risk. However, both of these risks were allocated to the highest category by some respondents. The risk of wasting time and opportunity due to poor information was rated in the lowest category, or not ranked at all by the majority of respondents although some considered it to be in the highest category. Finally risk of contaminated product was considered not to be a risk by the majority of respondents.

Other risks

One participant cited risk of purchase of fish from Illegal, Unreported and Unregulated fish; that is fish from illegal landings outside fisheries management systems. This was countered by finding a reputable supplier.

Measures to reduce risks; wild caught seafood

The measures to reduce risk in sourcing wild caught seafood are described in Table 20. The measures to reduce these risks are dominated by setting up formal systems to assess risks, which can be made available to consumers and investors and less formal systems that seek internal and external advice to avoid these risks. To avoid fish shortage due to stock depletion, reliance is put on being able to switch to different stocks, finding well managed stocks and using certified fisheries. Effective public relations and out reach to non-governmental organisations were considered useful strategies for avoiding damage to reputation due to perception of poor stock sustainability and

becoming a target for green campaigners. Gear types were selected by some respondents on the basis of their perceived ecological effects.

6.5.2. Aquaculture seafood supply risks

It was not possible to calculate the coefficient of concordance (Grzegorzewski 2006) as in sections 6.3.2 and 6.5.1, because none of the participants had scored consecutively all of the risks (this is a pre condition of the calculation of this statistic). Inspection of Figure 14 and Figure 15 reveals no clear consensus in the order of allocation of risks. The only message seems to be that contamination is considered to be a more important risk than for wild caught seafood.

Other risks

Four respondents cited other risks for aquaculture supplies;

- Risk of not being able to find a responsible supplier. If a very tight specification for environmental management of aquaculture facilities is used it may be difficult to find sufficient compliant suppliers. This is perceived as a problem in a growing business. This risk can be countered by improving suppliers' education and understanding.

- Risk of insufficient control over the provenance of the food supply to aquaculture; this needs vigilance particularly when producers are under competitive pressures

- Risk of bad publicity due to culling of seals around aquaculture cages; this is really an ecological effect relating to reputation, and is countered by a systematic approach to ensuring adequate codes of practice agreed with suppliers.

- Risk of lost opportunity due lacking of knowledge of ecological advances in aquaculture technology; this is an opportunity risk and is best countered by improved knowledge and communication.

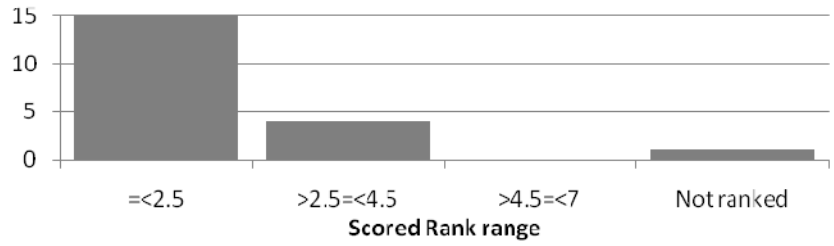
Measures to reduce risk

The measures to reduce risks were coded and listed in Table 21, showing numbers of respondents using each measure against each risk. The measures to reduce risks are dominated by using codes of practice either following external or internal standards, they also reveal some participants drawing on corporate social responsibility policy for countering social and economic risks.

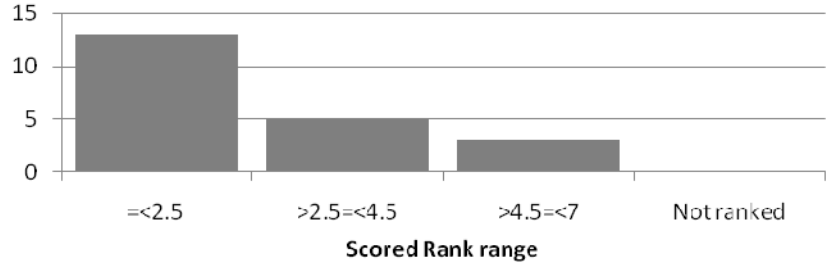
Summary

Reputational and stock depletion risks were the two most frequently cited as highest risks in the sourcing of wild caught seafood. The results for aquaculture are less clear cut. Risks from both sources of seafood were countered by formal and informal risk management systems.

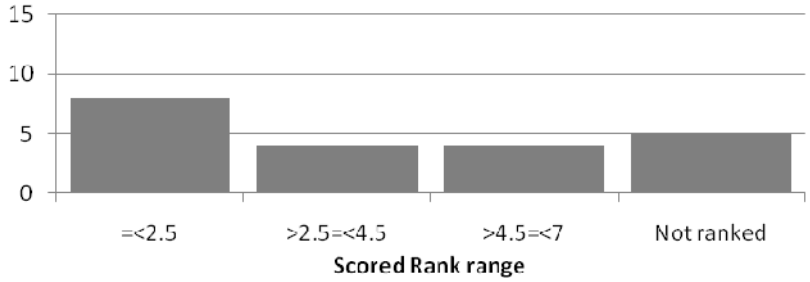
Risk of damage to reputation if stocks are not percieved as sustainable by consumer



Risk of fish shortage due to resource (stock) depletion



Risk of becoming a target for green campagners



Risk of damage to reputation if gear types are not percieved as ecologically sustainable by consumer

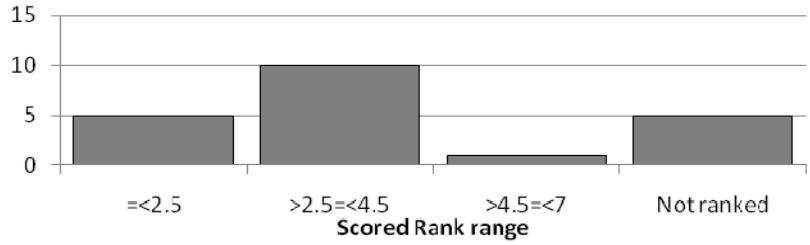
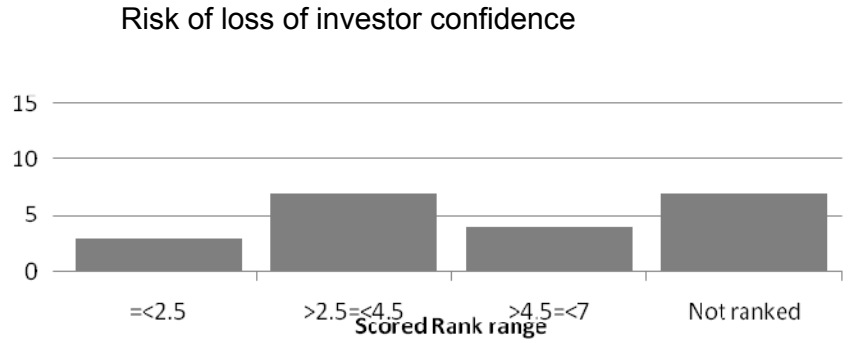
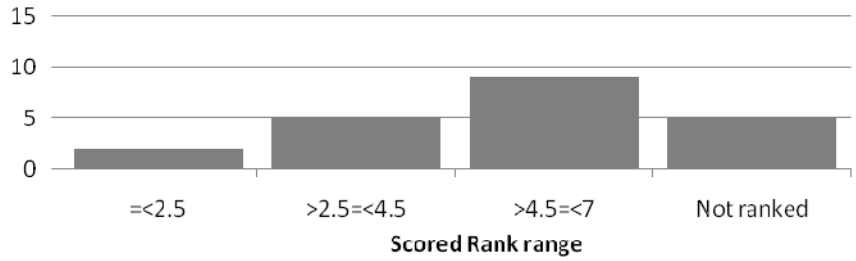


Figure 12 Question 4a; Number of respondents (X axis) vis scored rank range (Y axis) by perceived risk from wild harvested seafood. Number of respondents = 20





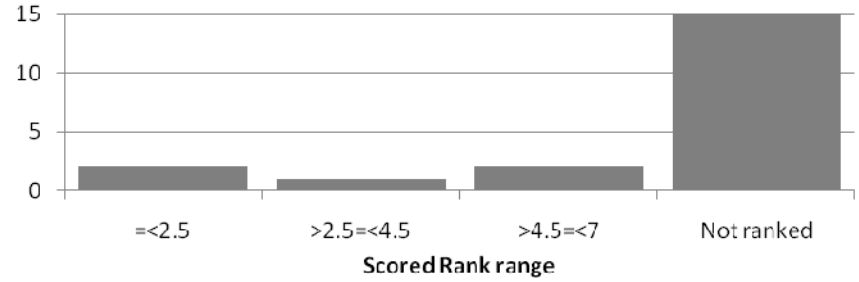


Figure 13 Question 4a; Number of respondents (Y axis) vis scored rank range (X axis) by perceived risk from wild harvested seafood. Number of respondents =20

Table 20 Question 4a wild caught seafood risks vis measures to reduce risk; number of respondents indicating each measure No of resp = 20

Measures to reduce risk	Damage to reputation if stocks are not perceived as sustainable	Fish shortage due to resource (stock) depletion	Becoming a target for green campaigners	Damage to reputation if gear types are not perceived as ecologically sustainable	Loss of investor confidence	Wasting time and opportunity because of poor information	Contaminated product
Formal risk management systems communicated to consumers and investors	5	3	4	3	3	2	
Internal policy, seeks internal and external advice	4	2	3	3	2	1	
Ranked, but no measures		2	3	2		6	1
Use public relations effectively	4		2			1	
Seek advice from suppliers	1	2			2		
Purchase from reputable suppliers				1			2
Seek independent advice	2			1		1	
Use certified fisheries		2			1		1
Avoid endangered stocks	1	2					
Specify gears				3			
Trade in different stocks		3					
Active outreach to NGOs			2				
Sourced from managed stocks		2					
Involve Seafish			1			1	
Source from sustainable sources		1					
Use customers' spec.						1	

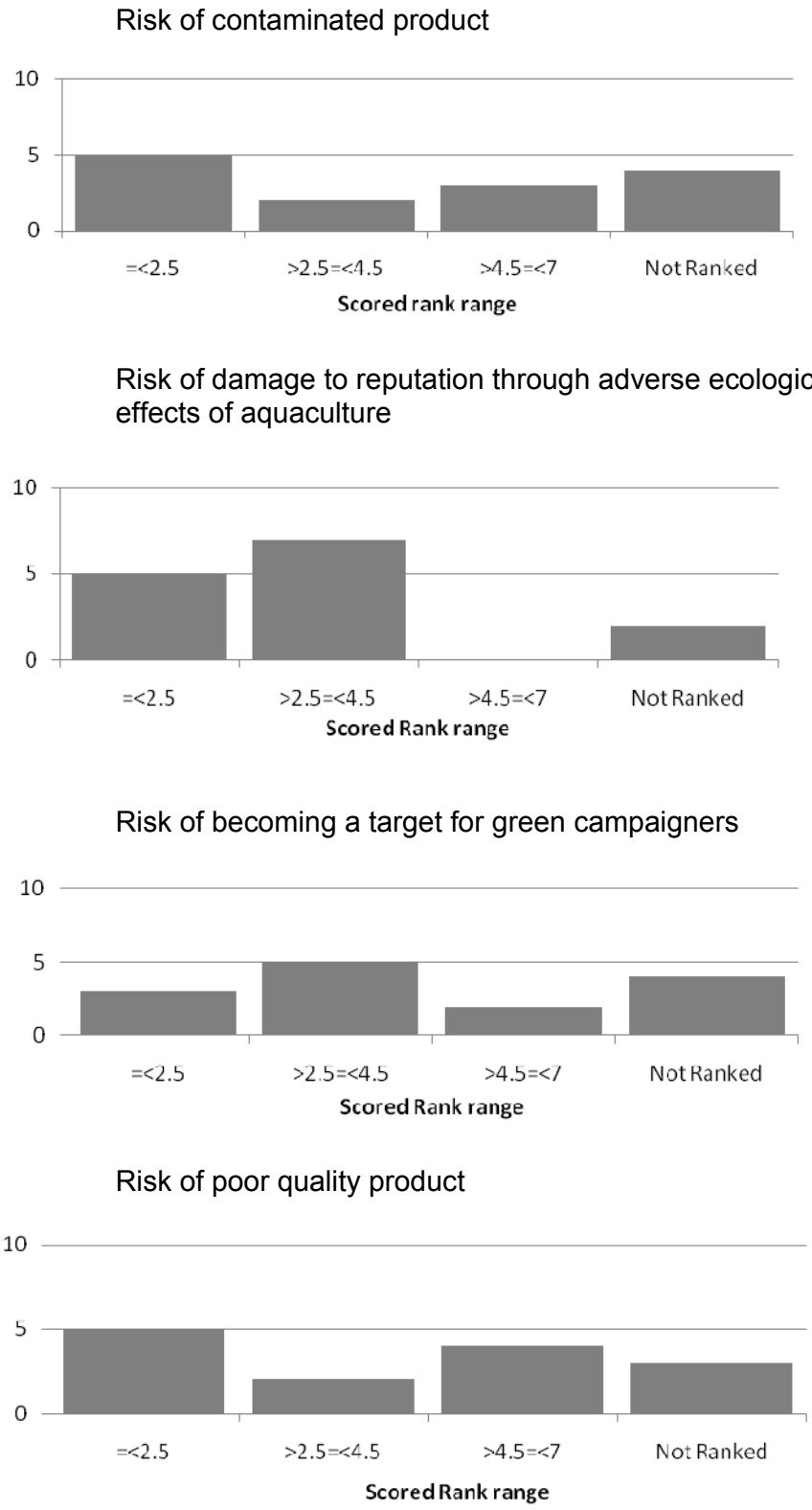
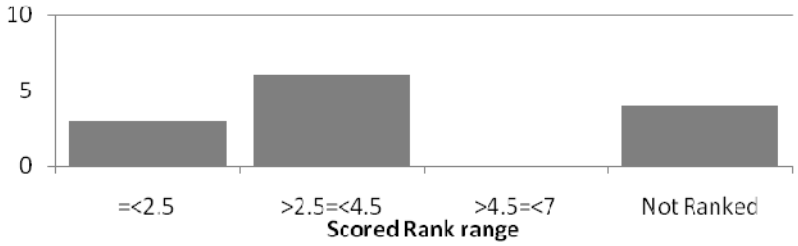
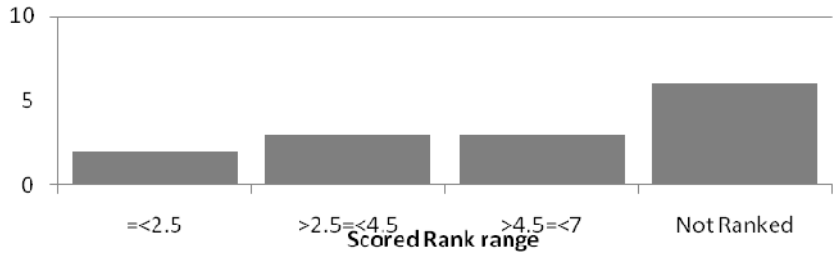


Figure 14 Question 4b; Number of respondents (Y axis) vis scored rank range (X axis) by perceived risk from aquaculture sourced seafood Number of respondents = 14

Risk of damage to reputation through adverse social and economic effects of aquaculture



Risk of loss of investor confidence



Risk of wasting time and opportunity because of poor information on sustainability issues

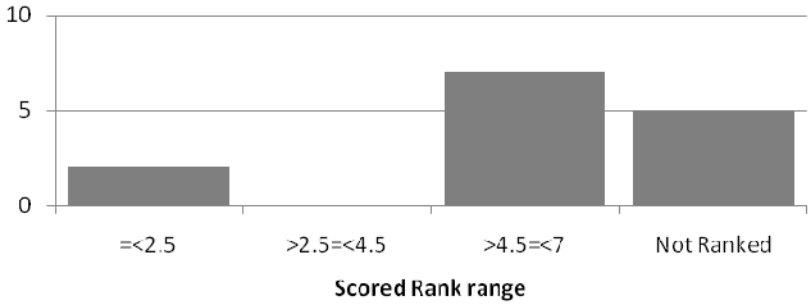


Figure 15 Question 4b; Number of respondents (Y axis) vis scored rank range (X axis) by perceived risk from aquaculture sourced seafood Number of respondents = 14

Table 21 Question 4b Aquaculture seafood risks vis measures to reduce risk; number of respondents indicating each measure No of respondents = 14

Measures	Contaminated product	Damage to reputation through adverse ecological effects of aquaculture	Becoming a target for green campaigners	Damage to reputation through adverse social and economic effects of aquaculture	Loss of investor confidence	Poor quality product	Wasting time and opportunity because of poor information
Follow codes of practice; supply chain control measures	2	5	2	2		2	2
Best practice as reference to internal standards	2	4	2	2	2	1	1
Ranked, but no measures			2		1	3	3
Be informed; spend time informing policy		1	1				3
Corporate social responsibility policy				2	2		
Be open about sourcing policy			2		1		
Reputable supplier	1					2	
Avoid open market in aquaculture products				1			
Communicate up and down supply chain	1						
Quality control						1	
Rely on legal controls	1						

6.6. Traceability and stock status information requirements

Ten of the twenty two respondents replied that their information on stock status was sufficient (Table 22). However, for many stocks (Table 23) a major issue was to obtaining conclusive information and many of these species could be described as information poor. Even for cod stocks, which are probably some of the most intensively assessed stocks, not all are fully assessed in relation to standardised safe biological limits (see Appendix I). There was also an issue of information being available rapidly enough and being up to date.

The main issues concerned with traceability concerned open market sourced fish. It can be difficult to formulate methods that can distribute traceability information, particularly for fish that passed through markets, rapidly, reliably and cheaply. Processors and retailers reported that they could achieve traceability back to vessel when using sourcing contracts in many cases, but that it was more difficult for fish sourced from certain geographical areas.

Table 22 Question 6 stock and traceability status of respondents' supplies

Status	Yes	No	Reasons for Yes	Reasons for No
Enough information on stock status	10	12	Even those answering yes to this question have some stocks for which they would like further information listed in Table 23	List of species and stocks Table 23. Stock status information needs to be regularly updated and rapidly available. It is difficult to find conclusive information for many stocks.
Enough information on traceability	15	7	Use British Retail Consortium and other traceability systems, allows traceability back to boat, or group of boats. Avoid buying on open market.	Traceability can be difficult for open market sourced (as opposed to contract sourced) fresh and frozen product. It can be difficult to formulate how to distribute traceability information rapidly, reliably and cheaply.

Table 23 Question 6 Stocks and species and groups of species on which the respondents desired further information; also included are requists for further responsible sourcing guides from question 8d

North Atlantic; Non assessed species turbot, dab, megrim, witch, skates and rays, dogfish, gurnards,. flounders, spider crabs, halibut, catfish (wolf fish) and redfish, Arctic char, tusk, silver smelt. **Tropical;** swordfish, tunas, game fish, flying fish, snappers, grouper, reduction fisheries for prawn feeds, particularly in south east Asia. **Pacific;** Alaska pollock from Russia, Chinese home waters stocks; for example Pacific cod. **Africa;** kingclip (South African ling) **Aquaculture;** salmon from aquaculture, Pangasius (river cobbler), yellowfin sole.

6.7. Information sources and flows

This section contains information on the tools, mechanisms and information sources which the respondents use for responsible sourcing. Also discussed are presentation of sustainability information and the various features of the guides any additional features which might be considered.

Information sources

Question 7 asked the respondents to list their sources of information for responsible sourcing by purpose to which it was put, and then rank each source for its purpose. However, most respondents were reluctant to rank their sources. The results are presented as counts of numbers of respondents using each source of information by use of the information. Use was coded as four types; decision making, informing customers, gauging likely consumer views and general background education and information. The results are shown in Table 24 for smaller processors (seafood turnover less than £m 60 per annum), Table 25 for the larger processors (seafood turnover larger than £m 60 per annum) Table 26 for the retailers and Table 27 for the restaurant sectors. These data are also presented as flow charts in Figure 16 and Figure 17.

The division of the processors into two categories was based on the results from section 6.4 in which there appeared to be a difference in the main objectives of the smaller (less than £m 60 turnover in seafood per annum) and larger processors (more than £m 60 turnover in seafood per annum). The characteristics of the information sources used by the varies as described below;

- The smaller processors (Table 24; Figure 16) relied on a relatively small range of sources, with information from their suppliers being numerically most important. They used the responsible sourcing guides to inform customers, but were also involved in Seafish groups (common language group, and its derivatives section 5.3). MCS fishonline was used by one of these for gauging likely consumer attitudes.

- The larger processors (Table 25; Figure 16) used a broader range of sources (there were also more of them in the sample; 9 larger processors responded compared with 6 smaller ones) with the main ones for decision making being Marine Stewardship Council, Sustainable Fisheries Partnership's Fishsource website, Seafish responsible sourcing guides. MCS' fishonline was used but in a supporting role.

- The retailers (Table 26; Figure 17) differed in their attitudes to responsible sourcing. One preferred to rely on their suppliers to help formulate policy and derive criteria for fisheries selection, the other three took a more proactive role in using the information to decide on their policy and select fisheries. As with the larger processors Fishsource, Seafish responsible sourcing guides and MCS fishonline were used although it was commented that the utility of the latter had slipped because the updating had fallen behind. However, some used the original scientific sources such as ICES and the Icelandic Marine Research Institute.

- The restaurant sector (Table 27; Figure 17) used a very different set of sources; the only two in common with the other sectors for decision making were the MCS Fishonline and the Marine Stewardship Council. This was the only sector to mention MCS' pocket fish guide.

When asked specifically about the use of the Seafish responsible sourcing guides the respondents broadly confirmed the results outlined above and the results are shown in Table 28. The range of species used was wide (not tabulated) with retailers reporting using all the guides whilst processors tended to use a selection.

Features of the responsible sourcing guides

The respondents were asked to rate the different features of the guides on a scale of 1 to 5; where 1 is most important and 5 is less important with ties permitted. The rating score was calculated as the sum of the inverse of the ratings for that feature (those not rated were given a score of 0; the most a feature could score was 16 with all the respondents scoring it 1). The results are presented in Table 29 as counts of each rating of each feature of the guides

and the rating scores. These results suggest that the most popular features of the guides were the ‘stock status information’ and ‘stock status tables’ where the methods for assessments and the status by stock are described. Next most popular were ‘fisheries and research’ and ‘management and conservation’, ‘time series graphs’ and ‘introduction’ in that order . There was less interest in the buyers’ top tips and the references. However, from the counts of ratings, only buyers top tips, fisheries research and time series graphs received more than one rating of 5, and only introduction, buyers’ top tips and references received more than one rating of zero.

However, four out of the 16 respondents rated all of the sections equally, at 1 and two of them commented that they liked the concise nature of the document one particularly highlighting the reference section as indicting a good science base to the guides. Another comment was ‘would not like to lose anything; the management and conservation section is particularly helpful’.

Other features which could be included

The results of this question were coded into 7 categories and are shown in Table 30. There was also a comment from the restaurant sector that other publications should be used for communication with the trade (see below).

For fishing methods and the wider environment, it was suggested the information in ‘management and conservation’ should be built on, as this kind of information was difficult to find in one place. There was interest in information on biology and condition from the processing and restaurant sector. Four respondents suggested a ratings scheme, and all respondents were ask to comment on this aspect, the results of which are shown in Tables 41 and 42.

Three respondents suggested interaction with other sources of sustainability information; these ideas ranged from including the sustainability ratings from other sites, through creating a ‘desk top’ system which would allow the viewing of different sources of information through one window, to partnership with Sustainable Fisheries Partnership, operators of the Fishsource website.

Delivery of information

Figure 18 shows the count of scored ranks of the three delivery systems offered; online databases where specific stocks and fisheries could be looked up, fact sheets as in the responsible sourcing guides, and contact with specialist staff. Whilst these results show a clear preference for online database type information it was pointed out that they are not mutually exclusive, online databases can be linked to factsheets and *vice versa*.

Specific comments were as follows;

- Data bases are useful for rapid searching for information
- Fact sheets were useful for communication with colleagues
- There were those who valued the concise approach and self contained nature of the responsible sourcing guides' fact sheet approach; read this and this is all you need for a basic understanding
- Processors and retailers are not usually trained fisheries scientists, so advice and guidance from specialist staff is an important aspect of information exchange
- The restaurant sector was not likely to want to assimilate highly technical information; they would be more interested in observation and hands on experience. The style of literature they would be more likely to prefer is that of The Seafood Guide (Seafish 2009) and Seafood Choices Alliance's Good catch Manual (Seafood Choices Alliance, Marine Conservation Society et al. 2010) .

		Number of respondents by using each source by purpose			
Type	**Source of Information**	**Decision making**	**Information on consumer views**	**Informing customers**	**General education**
Science	Fishbase				1
Online info	Global fish.net				1
Science	ICES	1			
Science	IUCN Red list	1			
Seafish	Seafish staff	1			
Seafish	Seafish resp sourcing guide	1		2	1
Seafish	Seafish Industry Groups	1			1
Industry	Seafood Scotland				
Industry	Supplier	3			
NGO	MCS fishonline		1		

Table 24 Question 7; Sources of responsible sourcing information for processors of less than £m 60 turnover per annum by use (6 respondents)

Table 25 Question 7; Sources of responsible sourcing information for processors of more than £m 60 turnover per annum by use (9 respondents)

		Number of respondents by using each source by purpose			
Type	**Source**	**Decision making**	**Information on consumer views**	**Informing customers**	**General education**
Govt	Norwegian and Icelandic Governments	1			
Govt	Responsible Icelandic Fisheries	1			
Science	Fishbase				1
Science	ICES	1			
Science	CEFAS	1			
Science	IUCN Red list	1			
Seafish	Seafish general info	1			
Seafish	Seafish Responsible Sourcing Guides	3		1	3
Seafish	Seafish Industry Groups				1
Seafish	Seafish Staff	1			
	Seafood Scotland	1			
Industry	Supplier	3			
Industry	Supplier; fishermen	1			
Trade Association	Seafood Choices Alliance	1			1
NGO	Sustainable fisheries partnership	3			
NGO	MCS fishonline	3	2	1	1
NGO	Marine Stewardship Council	5			
NGO	Monterey bay aq	1			1
NGO	Blue ocean institute				1
NGO	WWF	1			1

Table 26 Question 7; Sources of responsible sourcing information for retailers by use (4 respondents)

		Number of respondents by using each source by purpose	
Type	**Source**	**Decision making**	**General education, interest**
Science	Fishbase	2	
Science	ICES	2	
Science	IUCN Red list	2	
Science	CITES	1	
Science	Icelandic Marine Research Institute	1	
Seafish	Seafish Responsible Sourcing Guides	3	
Industry	Supplier	1	
Trade Association	Seafood Choices Alliance	1	
NGO	Sustainable Fisheries Partnership	3	
NGO	MCS fishonline	2	1
NGO	Marine Stewardship Council	1	
NGO	WWF	1	
NGO	Greenpeace	1	
NGO	Royal Forest and Bird Protection Society of New Zealand	1	

Table 27 Question 7; Sources of responsible sourcing information for restaurants by use (3 respondents)

		Number of respondents by using each source by purpose		
Type	**Source**	**Decision making**	**Enquiries**	**General education, interest**
Seafish	Seafish general info		1	1
Seafish	Seafish; Ealerts			1
Seafish	Seafish; The Seafood Guide			1
Trade Association	National Federation of Fish Fryers			1
Trade Association	Seafood Choices Alliance			1
Trade Association	Seafood Choices Alliance; The Good catch Manual	1		
NGO	Greenpeace			1
NGO	Marine Stewardship Council	3		
NGO	MCS fishonline	1		1
NGO	MCS Pocket fish Guide	1		

Table 28 Question 8a; use of Seafish responsible sourcing guides Number of respondents

Sector	Background information	For customer information	For obtaining sustainability information relating to decisions	Not used at present but are aware	Not a source we would use
Processor	3	5	2	3	3
Restaurant					3
Retailer			3		

Figure 16 Responsible sourcing information flow for processors. Thickness of arrows approximately related to importancebut see text for discussion of qualitative differences between sources Note main sources only, and certifiers ommited for clarity

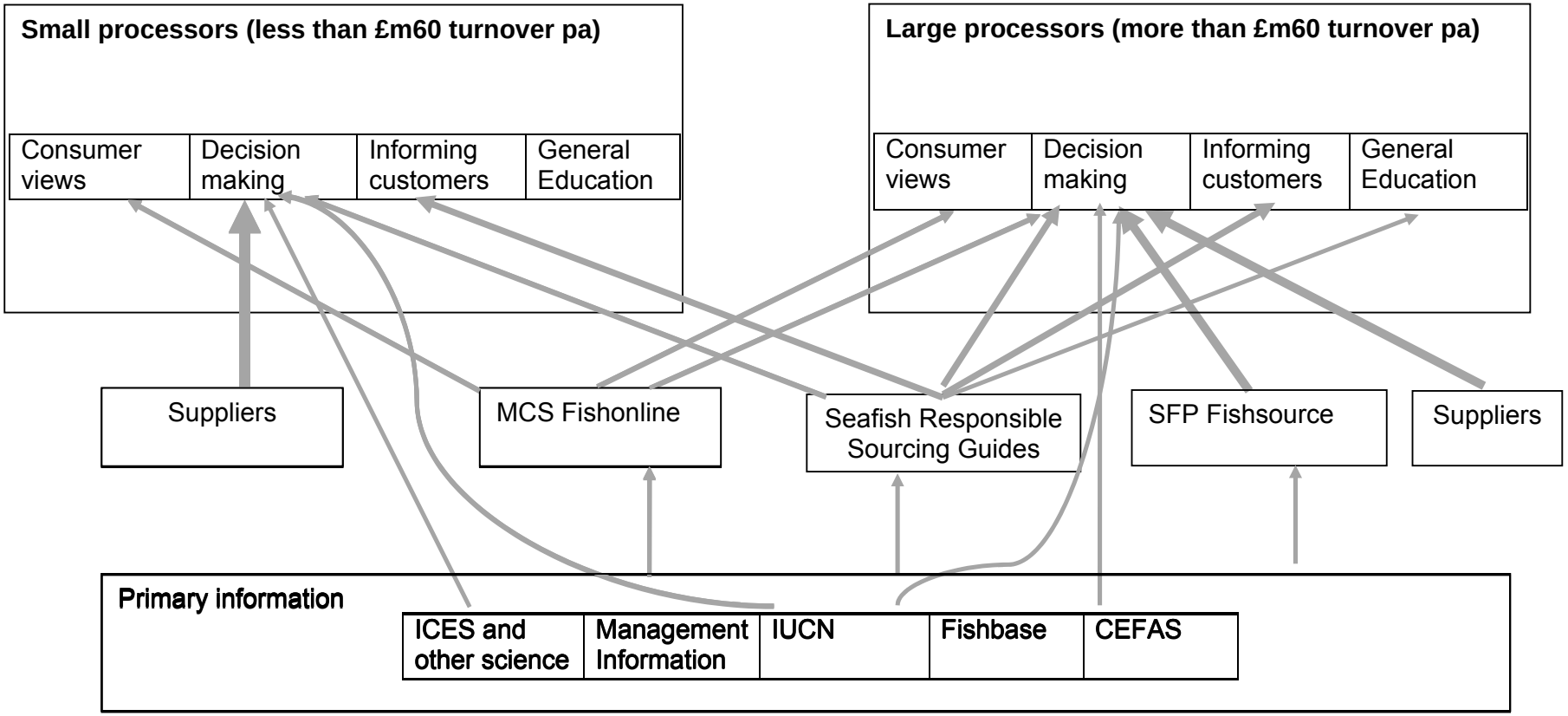


Figure 17 Responsible sourcing information flow for restaurents and retailers. Thickness of arrows approximately related to importancebut see text for discussion of qualitative differences between sources Note main sources only, and certifiers ommited for clarity

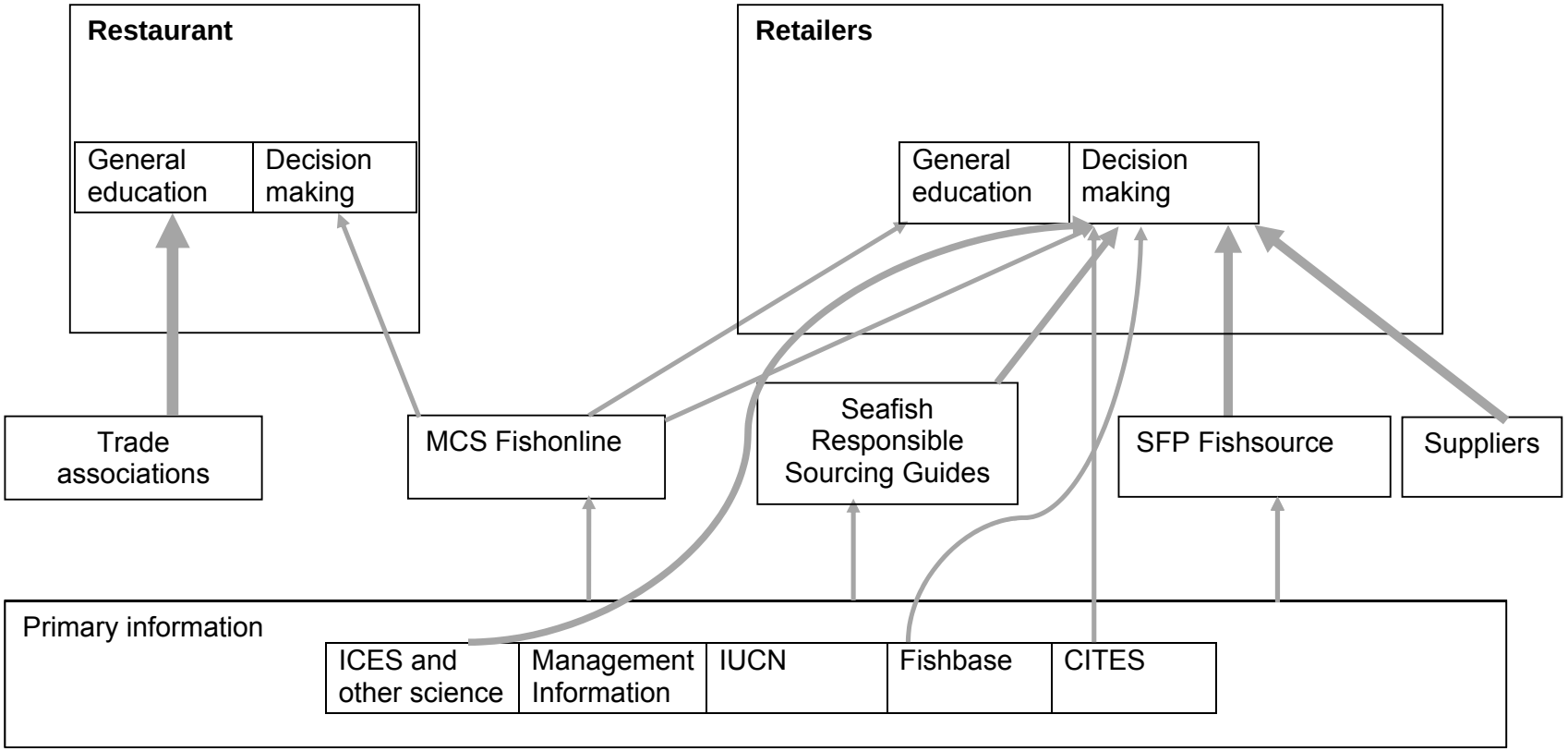


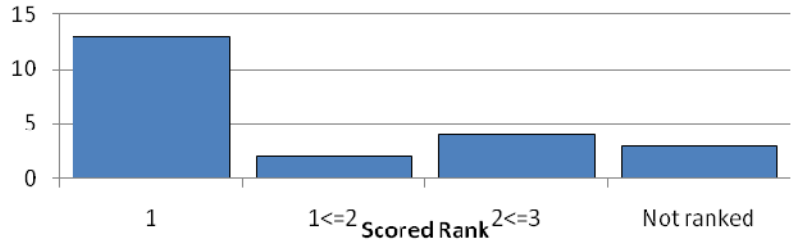
Table 29 Question 8b; Approval ratings of different features of Seafish responsible sourcing guides in the order they appear in the guides (16 respondents)

	Rating						
	1	2	3	4	5	0	
Feature	Counts of Ratings						
							Score out of 16
Introduction	7	5		2		2	10.00
Buyers' top tips	5	3	2		3	3	7.8
Stock status information	13	2	1				14.3
Stock status tables	13	2	1				14.3
Fisheries and Research	10	2		1	3		11.9
Time series graphs (not all guides)	8	2	1	1	3	1	10.20
Management and conservation	8	5	1	1	1		11.3
Product characteristics	7	2	2	3	1	1	9.6
References	6		3	2		5	7.5

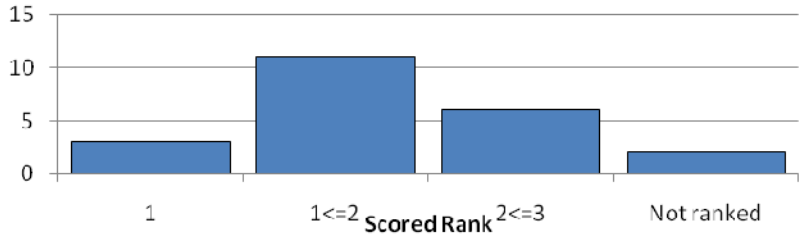
Table 30 Question 8c; other aspects which you think should be included (13 respondents)

Feature	Processor	Restaurant	Retail	Total
Fishing methods and the wider environment			2	2
More information on biology and condition	1	1		2
No more; avoid information overload	2			2
Other ratings; MCS and MSC certifications	1			1
Partnership with Sustainable Fisheries Partnership	1			1
Rating stocks; how to make an informed choice	3		1	4
Create a desk top system that allowed the views of different organisations to be available through one source			1	

Online searchable database



Fact sheet approach; as in Responsible Sourcing Guides



Direct contact with specialist staff

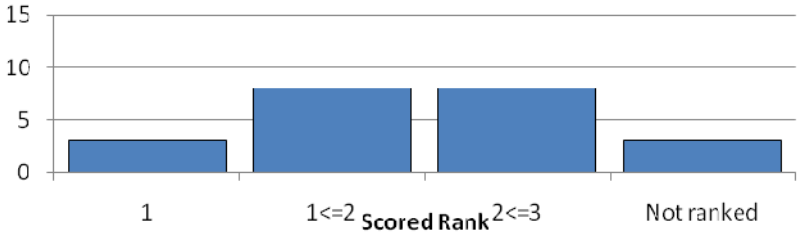


Figure 18 Question 9; Numbers of respondents (Y) vis scored rank (X) for delivery of information methods; 19 respondents

6.8. Responsible sourcing information for the consumer

A diversity of views was expressed on this subject which are reproduced in full in Table 31, 3Table **32**, and Table 34 for small and large processors, retailers and restaurants respectively. These are presented here by sector, for those with consumer communication expertise to consider.

Table 31 Question 8e; views on producing responsible sourcing information for the consumer ; processors less than £m 60 turnover per annum seafood product

Views on Seafish producing responsible sourcing information for consumer
Guides are a hidden secret; should be in supermarkets, let consumers know about it
Consumers only need to know it is sourced correctly. Certain people can afford to be concerned, it is up to us to make it safe
Generally Apathetic

Table 32 Question 8e; views on producing responsible sourcing information for the consumer ; processors with more than £m 60 turnover per annum seafood product

Views on Seafish producing responsible sourcing information for consumer
Restrict this to media friendly guides so the media can publish articles
Needs regular and more visible updates
Should be available, but very different to Business to business information
Yes, Seafish should produce responsible sourcing information in the form of 2 page guides. Would be useful for consumer. Posters with responsible sourcing information; how sustainable the fish is; where is the fish coming from
Would rather that customer dialogue is with us, the supplier
If a format could be found for the end consumer yes, conditional on finding format
Don't waste your time unless it is short and snappy
Consider that this is not required; however Seafish would do a better job than what we currently have. Consumers are concerned more about price and presentation

Table 33 Question 8e; views on producing responsible sourcing information for the consumer ; retailers

Views on Seafish producing responsible sourcing information for consumer
Fantastic if you could, how to deliver that information; 'Seafish good fish guide', pull all the guides under one banner, somebody would need to take a view on sword fish for example. Responsible sourcing guide plus recommendation, making them consumer friendly not perceived as to difficult
Would need a very simple communication with the customer; look after the people with half a story, but too much information is not a good thing Prepare information for journalists, and educate journalists
Fundamentally a good thing, as long as there is agreement on terminology and messaging; example meanings of the terms 'sustainable' and 'responsible'. More accurate info the better, needs to avoid dumbing down or being to complex, needs to resonate with consumer.
Have information made available to people in an easier way

Table 34 Question 8e; views on producing responsible sourcing information for the consumer ; restaurants

Views on Seafish producing responsible sourcing information for consumer
Guides which are fun and easy to understand but with a serious point of view; a poster for illustrating responsible sourcing for fish and chip shops and restaurants
Of course, more that goes to consumer the better, sustainability awareness is increasing. Fragmentation is to be avoided; see Good catch manual
Seafish should become involved in educating the sellers in the shops. Produce easy to understand leaflets to tell the story behind sustainability. The responsible sourcing guides are too technical.

6.9. Standards and scoring systems

The results of the question 10 outlining standards are shown in Table 35 and Table 36 for small and large processors Table 37and Table 38 for retailers and restaurants (wild caught seafood product only). This can only be the most basic analysis of the standards, based on discussions at the interview and references to the respondents' websites.

There is evidence of the approach to standards being more complex in the larger processors and retailers, which is as would be expected although respondents with their own written policies occurred in all sectors.

Smaller processors tended to concentrate on legal controls, although some had additional criteria they took into account. They are of course most likely to be driven by their customers although some were clearly taking a pro active approach and setting out their stall in terms of sourcing policy; at least one had a sourcing policy with criteria, and another had a "what we do statement".

Larger processors were found to be taking a more sophisticated approach with some developing standards with their retailers and some having standards behind their own brands. All retailers had a written policy, and these policies were mostly backed by a decision tree of varying levels of sophistication. These decision trees were structured so various risk assessment criteria were examined and supplies not meeting these criteria were not used. This enables information to be gathered from multiple sources. Taking each of the criteria in turn;

- In relation to safe biological limits it was recognised that there is not always standard information available, so evidence has to be gathered on other reference points and management regimes. However, retailers varied in their level of understanding of these aspects and at least one was asking their supplier to set standards.

- There was selection by gear type in the both the retailing and processing sectors some using risk assessment approaches. Some of this related to product quality. However, one of the restaurant respondents felt that clarity was lacking in the information available on gear effects and this made him reluctant to use gear type as a criterion for environmental sustainability.

- The use of scores from the Fishonline and Fishsource are more fully discussed in section 6.7. In the retail and processing sectors Fishonline was used to look at likely consumer and retailer sensitivity but not be a make or break decision maker on a source of supply and Fishsource was more likely to be used as a part of the risk assessment approach. However, not all retailers and processors knew about Fishsource (section 6.7). For the restaurant sector, Fishonline was more likely to be used, along with supplier knowledge.

An important message which came across from most of those which set sustainability standards was that these standards had an affect on sourcing and could result in supplies being turned down at economic cost to the business. Indeed, some commented that they sometimes found that opportunities had to be forgone because they did not meet sustainability standards. With businesses which supply many retail outlets with millions of pounds worth of branded product per week there are certain to be regular enquiries from the general public on aspects of sustainability which have to be answered. The use of standards plays an important role in suppliers being able to answer such questions.

Sustainability scoring systems

Question 11 of the questionnaire asked for open ended comment on sustainability scoring systems. A variety of views on sustainability ratings are expressed in these comments which are reproduced in Table 39, Table 40, Table 41, Table 42, some of which are diametrically opposed. Several concepts are evident;

- The need for transparency, consistency and simplicity to avoid confusion. One respondent phrased it; you need to imagine you are explaining the issues to the minister of fisheries.

- The main complaints concern complexity, inconsistency and lack of accountability. There was concern that this scientific information on stock status should be used a 'buyers guide'.

- Competition between sources is perceived as not a sensible outcome, but there was a suggestion by three of the respondents that there should be some relationship or collaboration with Sustainable Fisheries Partnerships (Fishsource), with one respondent suggesting that Fishsource's rating system should be used as an independent tool to drive other systems.

- There was concern for stocks where assessment information was not available.

- There was a need to ensuring that information was as up to date as possible.

Responsible fishing scheme

The comments on the responsible fishing scheme are reproduced in full in Table 43 to Table 46. There is more knowledge of the scheme from larger retailers and processors, some of whom are actively encouraging its use, although none have made it a condition of supply. There is concern from two respondents that it only indicates responsible behaviour on behalf of the vessel and not sustainable stocks. There was no knowledge of the scheme from the restaurant sector.

Table 35 Question 10; sourcing policy and outline criteria; processors

Of less than £m 60 turnover per annum; 6 respondents

Purchasing policy	Number responding yes
Do you have a written policy on purchase of Seafood relating to sustainability?	3
Other policies; has a "what we do" statement	1
If yes, is it publically available?	3
Criteria	
Do you specify that stocks should be inside safe biological limits?	2
Do you specify that fish should only be from certain gear types?	1
Do you specify that fish should only be from certain gear types?; relates to quality	2
Scores by MCS www.fishonline.org	0
Scores by www.fishsource.org	0
Other criteria; Fish to quota	2
Other Criteria; IUCN Red list	2
Other criteria; own selection system	1
Other criteria: ICES Assessments	2

Table 36 Question 10; sourcing policy and outline criteria; processors, importers distributors; turnover more than £m 60 per annum 8 respondents

Purchasing policy	**Number responding yes**
Do you have a written policy on purchase of Seafood relating to sustainability?	5
If yes, is it publically available?	4
Criteria	
Do you specify that stocks should be inside safe biological limits?	3
Do you specify that fish should only be from certain gear types?	1
Do you specify that fish should only be from certain gear types?; relates to product spec.	1
Do you specify that fish should only be from certain gear types?; relates to quality	1
Scores by MCS www.fishonline.org	3
Scores by www.fishsource.org	3
Other criteria; own selection system	2
Other criteria; Fish to quota	3
Other Criteria; IUCN Red list	4
Other criteria; Legal and IUU compliant	3
Others criteria MSC; certification	1

Table 37 Question 10; sourcing policy and outline criteria; retailers (4 respondents)

Purchasing policy	Number responding yes
Do you have a written policy on purchase of Seafood relating to sustainability?	4
If yes, is it publically available?	3*
Criteria	
Do you specify that stocks should be inside safe biological limits?	4
Do you specify that fish should only be from certain gear types?	4
Other criteria own selection system	4
Other criteria; IUCN Red list	4
Other criteria; own selection system	2
Others criteria; MSC certification	1
Scores by MCS www.fishonline.org	2
Scores by www.fishsource.org	2

*Note; one was in preparation at the time of response, and will be available

Table 38 Question 10; sourcing policy and outline criteria; restaurants (3 respondents)

Purchasing policy	**Number responding yes**
Do you have a written policy on purchase of Seafood relating to sustainability?	1
If yes, is it publically available?	1
Criteria	
Do you specify that stocks should be inside safe biological limits?	1
Do you specify that fish should only be from certain gear types?	1
IUCN Red list	0
Other Criteria; Seafood Choices Alliance Good catch manual	1
Scores by MCS www.fishonline.org	2
Scores by www.fishsource.org	0
Supplier knowledge	2

Table 39 Comments on sustainability scoring systems; processors, importers and distributors turnover less than £m 60 per annum in seafood products

Comment
Needs to be a simple method - understandable for the person in the street. Avoid scientific terms; think about describing the stock situation to the minister etc. Sit round the table and discuss it with stakeholders
Not come across these systems
Would find them interesting and of some use in decision making
Depends on what you find. Difficulties for data poor stocks, reliability is a problem
Need one set of rules, not confusion

Table 40 Comments on sustainability scoring systems; processors, importers and distributors; turnover larger than £m 60 million per annum in seafood product

Comment
We take a proactive approach to scoring fisheries; wants to know the best place to find data for Seafish to provide an analysis of the information, in collaboration with fishsource (Sustainable Fisheries Partnership). Best to avoid competition between sources, after all data is common
Sustainability Scoring systems; Seafish scoring scheme; YES but need to be impartial regarding existing schemes and give commentary on how and why. Possibly along SFP lines, an indexed metric of stock status etc and Biological Reference Points scores are derived; NOT A TRAFFIC LIGHT
Very useful but commercially dangerous currently; would welcome a Seafish system.
All a little vague and confused, concerned about inconsistency, and accuracy
Possibility of setting up system for Seafish; avoid anything other than sustainability situation in relation to the stock.
If you need a scoring system, you are not qualified to do your job-they [customers] want everyone to do it for them, who would be accountable for it? ICES data should not be used as a buyer' s guide

Table 41 Comments on sustainability scoring systems; retailers

Comment
Should have informed recommendation for buyer, rank stocks. How to make an informed choice. Fishing methods and wider endowment
Yes they are a good tool, not widely used; consider Sustainable Fisheries Partnership (www.fishsource.org) system brilliant. Discontinued using Marine Conservation Society (www.fishonline.org) because it was limited and had fallen behind with the updating.
Scoring systems are useful as long as they are up to date and consider all available evidence. The scoring system rationale must also be available and ideally available for stakeholder consultation and input. They also cannot be too generic in their approach to species, stocks or fisheries or they will be ineffective from a market perspective. I believe there needs to be a more streamlined approach to scoring, for example by looking towards the Sustainable Fisheries Partnership (www.fishsource.org) system as the model and perhaps using it as an independent tool to drive other ratings (such as Marine Conservation Society). Occasionally, MSC certified fisheries do not score well in systems as often the scores do not take account of conditions of certification and the fishery improvements that arise from conditions. This must be carefully considered as contradictory messages can then be sent to the consumer, who is already confused by the subject.
MCS-- scoring 1-5 = transparent but needs updating

Table 42 Comments on sustainability scoring systems; restaurants

Comment
More information should be on the packaging, for example a map of the world where the fish comes from and a website for further information
Good and bad, if you are well informed why have one? If scores are different what do we to do? Therefore we need guidance but not confusing scores
Can be very complex to understand and confusing. Would want a more translucent simplified system for laymen

Table 43 Comments on the responsible fishing scheme; processors less than £m 60 per annum turnover in seafood product

Not come across
Not come across
Large boats would be BRC audited (importer)
Have bought fish from vessels, no price premium, but consider it a good start. Only indicates responsible boat but not necessarily sustainable stocks.

Table 44 Comments on the responsible fishing scheme; processors, more than £m60 per annum turnover in seafood product.

To be encouraged, however Responsible Fishing Scheme is not being used in our decision tree.
Would recommend joining but not a condition of supply as yet; agents are being pushed into it, will become important
Limited to UK and most of our supplies are imported
Yes, heard of commendable, good first step, however does not take sustainability into account therefore could be abused?
Wholly supportive, marketing publicity, sets a basic standard, charge is relatively low. Not a decision breaker but would want to fishermen to pursue it, put it on 'to do list'
No views; but some of our Retail multiple customers do

Table 45 Comments on the responsible fishing scheme; retailer

Comment
We are very keen to start addressing this, looking at more local produced fish, look at putting logo on labels
Have endorsed it and labeled up products from boats in South West. More of an industry tool helps me make decisions, as due diligence tool. However not make or break, having it makes the process smoother but would chose RFS all else being equal
I think this is a fundamentally sound system for initial vessel assessment on the basis of good practice but I do not believe that it delivers an ongoing measure of sustainability. From a good practice point of view, the absence of an ongoing audit framework compromises the scheme. *Note this is incorrect*
We do use

Table 46 Comments on the responsible fishing scheme; restaurant

Respondent	Comment
All	None of the restaurant respondents had heard of the responsible fishing scheme

7. Discussion

7.1. Design of the questionnaire

Likert attitudinal scales

The analysis of the Likert scales using factor analysis did not reveal consistent factors, which might have provided evidence for underlying constructs or patterns of thought. However, the results did reveal that certain statements elicited responses that were more consistent than others, and in there is some evidence of disagreement between the respondents. Further work with more refined statements might have revealed underlying constructs, but for the purpose of this survey the results from the attitudinal scales have probably yielded sufficient information (see section 7.4).

Ranking of entities and risks

There is a risk of bias arising from the order in which these items were listed on the page. Some market research questionnaires rotate the items on the list between questionnaires in an effort to eliminate this potential bias. However, this means that adjacent items remain associated until they reach the top of the list. A better approach would have been to randomise the order of presentation of items from between copies of the questionnaire.

In this case, two of the ranked lists, the entities responsible for fish stocks and the risks attached to sourcing wild caught seafood resulted in concordant ranking between the respondents. In the case of the risks attached to sourcing aquaculture produced seafood there was no concordance apparent. This suggests that the effect of the order of the items on the page was not of importance but should be a consideration in future.

7.2. Execution of the survey

This survey was carried out entirely by Seafish staff in on a subject that Seafish has been actively engaged in for several years. The principle interviewer, the author was known many of the participants as one of the authors of the Seafish

responsible sourcing guides. Potentially this may have altered the responses of to the questionnaire. However, there is no way of sensibly testing this since the other interviewer only carried out 3 interviews. Also, there were three methods of delivery of the questionnaire; face to face, on the INTERWISE with a shared copy of the file and by telephone with two copies of the file. There is no way of testing whether this produced altered responses; some strata were solely by one method or another.

One of the strengths of using Seafish staff is that they can engage at a high technical level with the respondents, whereas an independent market research organisation would only be able to ask the questions as written. In most cases there was a two way exchange of information and information sources.

Only the catering sector produced a seriously high rate of non response although the retailer non response number was at the same level. This was largely due to the length of time it took to deliver the questionnaire; potential respondents were always warned that it would take at least 'an hour plus'. Also for development chefs in catering establishments, even specialist fish restaurants there are many other aspects to consider than sourcing of fish, the rest of the respondents were very much fish specialists.

7.3. Validity of the sample

As described in section 5.3 this survey was aimed at those who potentially used sustainability information to make buying decisions concerned with buying seafood, or advised those making buying decisions concerned with buying seafood. This means that it not intended to be representative of the seafood industry as a whole since not all seafood processing businesses reported using sustainability information in the processor survey (Brown 2008). If information on the whole industry's approach was required, then a very different approach would be adopted with a much shorter questionnaire to a great many more businesses use a randomised sample of all businesses, stratified as appropriate. For the processor and retailer sectors, although the respondents may not have been fully representative of the UK industry as a whole, they probably represented a powerful sub set (as indicated by their gross turnover)

whose influence is likely to be felt in many other businesses even when those managing these businesses may not necessarily agree with their views.

The sample from the fish and chip shop sector was small and combined with the catering college lecturer to form the 'restaurant' sector when the sample where appropriate. This group could not be described as having as much power as the other two sectors. Nevertheless they can fairly be described as leaders in their field; the fish and chip shop stratum contained the finalists from 'The Good Catch Sustainability Award 2010'. As discussed above there were more problems with non response from the catering sector. Fortunately, the catering college lecturer in culinary arts, who was also familiar with the seafood industry including the catching sector, was a very useful source for this sector and likely to be a leader in the field.

7.4. Principles and objectives

To enable Seafish to successfully serve its clients it there is a need to understand their principles and objectives even if these are not explicitly formulated. The three facets of this questionnaire designed to elicit these aspects are the Likert attitudinal scales, (question 2) the ranking of entities responsible for fisheries management (question 3) and the open ended question on objectives (question 5).

Attitudinal scales

There was evidence of agreement on some statements; see Figure 6 page 59 and Figure 7 page 60, which should be referred to for a full picture. The following statements elicited majority agreement between the respondents;

- There is a need to take into account ecological effects when considering fisheries sustainability

- Responsible sourcing should include an element of assessment of sustainability as well as a assurance of a legal catch.

This statement elicited majority agreement but with minority disagreement;

- Even when stocks are low, fish may be responsibly sourced from a fishery if the managers and fishers behave in a way that will lead towards stock recovery

This statement elicited majority disagreement but with some who agreed or strongly agreed;

- If a catch is legal, then it may be responsibly sourced; assessments of sustainability need not be included

Care has to be taken in interpreting these results since they may be sensitive to nuances in the phrasing. Also, a wider survey of the seafood industry might reveal less consensus. As far as information provision is concerned, the results suggest that these are crucial aspects of responsible sourcing which information sources should address.

Ranking of responsibilities

In this section the respondents were asked to select from a list of entities (see Figure 10; page 71 and Figure 11; page 72 for list of entities and results) and select which ones, in their business view, should be responsible for avoiding overuse of fish stocks. They were then asked to add any further entities and rank and assign roles to all those which they had nominated. The results, which statistically show a high degree of concordance (page 66) placed primary responsibility on the fishing industry, governments and scientists, followed by fish processors and retailers in a supporting role. Perceived roles for the fishing industry and governments included acting responsibly within the legal framework and collaboration for best practice. Scientists were considered important sources of independent advice whilst processors and retailers were considered in a supporting role. One processor indicated that fisheries improvement partnerships, which involve a cross disciplinary approach to improving fisheries management should be an important.

Another commented;

"Sustainability is far too important to be left to the market"

Thus collaboration, the recognition of sustainability information as a common resource are likely to be shared values amongst the group. This has resonance for Seafish in providing objective information and standards to underpin these approaches.

Multi stakeholder working groups, certifying bodies and environmental nongovernmental organisations were all recognised as being in supporting roles. However, the majority of participants considered that consumers should not be responsible for avoiding over use of fish stocks. When asked their views on Seafish producing responsible sourcing information for the consumer the respondents gave a diverse set of responses all of which are reproduced in Table 31 to Table 34 for those with consumer communication expertise to consider.

Objectives

The respondents were allowed a free hand in expressing the goals for their businesses' in the sourcing of sustainable seafood. This elicited differing categories of objective from the different sectors. The smaller processors (less than £m 60 turnover pa) tended to be more likely to cite reliance on current management or improvements in fisheries management as evidence of sustainability. They are more likely to rely on their customers for guidance. The larger processors and retailers were more likely to make efforts to assure sustainability through structured assessments of fisheries and certification. Restaurants for the most part, had different goals, which involved communication with suppliers, customers and others in the trade concerning sustainability.

These results indicate that information provision on the fisheries management systems important to the smaller processors which they can use to communicate with their suppliers and customers. For the larger processors and

retailers information that will help structured decision making would be desirable.

For the restaurateur, information that will help to communicate with suppliers and customers basic ideas in relation to sustainability would be more likely to find resonance.

7.5. Risk perceptions and mitigation

There was statistically a high degree of concordance (page 79) in the ranking of perception of sustainability risks in relation to wild caught seafood; see Figure 12, Figure 13 (pages 83 and 84). For wild caught seafood risks the majority of respondents considered the highest risks were considered to be the perception by consumers that fish stocks were not sustainable and the actual risk of fish shortage due to stock depletion. Targeting by green campaigners was considered a high risk by some, but not a risk at all by a higher proportion than the above two risks. Public perception of ecological risks relating to gear types were considered by majority to be a medium risk, with loss of investor confidence also regarded as a similar level of risk. For aquaculture sourced seafood (Figure 14 and Figure 15) there was no clear consensus in terms of ranking order of risks, but risk of contamination was considered to be of importance.

To mitigate these risks many respondents used formal risk management systems sometimes using external standards and communicated with consumers and investors where appropriate. Other concepts of importance were managing issues with environmental nongovernmental organisations and effective use of public relations.

Important types of information provision would be information that helps maintain the respondents' reputation, and which can feed into structured risk assessments. Seafish responsible sourcing guides clearly have a role in this aspect. The role of the Seafish common language group in its liaison with nongovernmental organisations is clearly of importance.

7.6. Traceability and stock status

For traceability, sourcing on the open market was a major barrier to obtaining traceability to stock level, although some can achieve it. Traceability systems are required by law for food safety reasons (EC 2002) . However, in market systems the traceability information is not normally held within one business so it is not always implemented routinely. Fish labelling regulations require labelling to FAO area (EC 2000), which for European stocks cover the whole Northeast Atlantic, within which there may be a number of stocks of a given species. Inevitably, the difficulty in maintaining traceability through market systems has implications for information provision to those sourcing seafood through markets because they may be unable to easily trace the fish to stock. Such information would need to be in general terms for that FAO area and not stock specific, which conflicts with the use of a stock as the central unit of sustainability assessment.

The main difficulties reported for stock status information were for information poor stocks. There are potentially so many information poor stocks that setting up systems for making relative assessments of sustainability for use when required are probably more important than producing more responsible sourcing guides. Recently, Seafish has been developing risk assesment methods for information poor stocks, based on Hobday, Smith et al. (2007).

7.7. Information types for different sectors

Processors used Seafish responsible sourcing guides mainly for informing customers and for background information, with some decision making. Retailers used these guides for decision making (particularly stocks which were not covered by Fishsource) and for background information relating to the environment fisheries management and consrvation.

Restaurants found the style of the guides not really suitable as information sources, but were very interested in visual material on responsible sourcing in the form of posters and leaflets to describe the concepts of fisheries assessment, management and responsible sourcing which could be used in fish and chip shops. Also ‘The Seafood Guide’ (Seafish 2009) and ‘The Good Catch

Manual' (Seafood Choices Alliance, Marine Conservation Society et al. 2010) style of publication appealed to this sector.

The Marine Conservation Society (MCS) website, Fishonline found most favour with the restaurant sector. However, the larger processors and retailers are likely to use it more for background and general information on what might be sensitive with retailers and consumers rather than for decision making.

Suppliers including fishermen were considered important sources of information. One processor was particularly interested in gaining knowledge of lesser known species which were routinely discarded because of the lack of a market for them.

7.8. Comparison between sources

Whilst most of the respondents were reluctant to rank their sources by purpose there was some discussion of the relative merits and uses for the three main sources used by the larger processors and retailers Seafish's responsible sourcing guides, Sustainable Fisheries Partnership's Fishsource and Marine Conservation Society's Fishonline. However, not all respondents knew of the Fishsource site. None of the smaller processors (below £m60 turnover in seafood products per annum) and three out of nine of the larger (above £m60 turnover in seafood per annum) and three out of four retailers knew about the Fishsource site.

In general, where there was information available on Fishsource, it was used as a primary source for decision making in the larger processors and retailers. This website uses a scoring system, which answers five questions quantitatively about each stock concerning stock health now and in future projections, on whether the management strategy is precautionary and whether scientific advice is followed. Seafish responsible sourcing guides will give the status of the stock in relation to reference points and the total allowable catch in relation to the scientific recommendation.

Seafish responsible sourcing guides tended to be used for background information. One processor put it;

'Seafish responsible sourcing guides present the information, whilst Fishsource process the same information and provide added value for decision makers'

Fishsource currently concentrates on assessed stocks for which it is much easier to provide these metrics. Seafish responsible sourcing guides are available for both assessed and non-assessed stocks, and are valued by both processors and retailers for their background information. They are also used by the smaller processors as information sources for customers. In this role the concise nature of the guides is valued.

MCS Fishonline gives an overall recommendation of fish to avoid or fish to eat, and a 5 point rating scheme. Currently it is more likely to be used in a supportive role to examine retailer or consumer sensitivity to a species or stock. Recently it has become less used because updating has been delayed over the recent year.

7.9. Standards and sustainability scores

These results can only give a limited overview of standards. There is clear use of both internal and external standards which go beyond the basic assurance of a legal catch by the larger processors and retailers in sourcing both wild caught and aquaculture seafood products, both in their descriptions of risk control measures and objectives. There was an objective to use more MSC certified product by one of the restaurants and at least one of the smaller processors was operating their own selection system. The Responsible Icelandic Fisheries (RIF) standard was mentioned as an information source by one processor, although it is not clear that it was being used as a standard. However, there is more difficulty in working to anything other than basic legal catch standards when trading in species for which there is less assessment information, such as exotic species from abroad.

An open ended question on sustainability scoring systems elicited a variety of views some in favour of the schemes and some opposed. It is clear that the larger processors and some of the retailers regard Sustainable Fisheries Partnership's Fishsource, which has a scoring system as a useful source for risk assessment for assessed stocks. However, MCS fishonline which also has

a scoring system is more often used as a supporting role particularly relating to consumer or retailer perception.

8. Conclusions

8.1. Main drivers

Reputation management was clearly a major driver for many of the respondents and therefore setting up internal risk management systems is an important method of countering this risk. However, in their ranking of responsibilities there was recognition of the need to work collaboratively through government and for processors and retailers to work in a supporting role to the in encouraging responsible behaviour in the fish industry. Responsible sourcing was, from the attitudinal scales, to many of the respondents more than just the minimum requirement of sourcing from a legal catch. The participants also took the view that consideration should be given to the ecological aspects of fisheries management.

The main relevance for Seafish of these results are that information on these attitudes, perceptions of responsibilities, objectives and risks are available to be drawn on when considering building a set of principles to work from when providing information and advice on responsible sourcing. It should be recognised that although this group surveyed was small, many were in powerful positions in the supply chain. More extensive survey might produce a diversity of views.

8.2. Information needs

Many, though not all, of the larger processors and retailers (more than £m60 - turover in seafood per annum) use risk management systems to control risks concerned with reputation and stock depletion. Those that were aware of the site used Sustainable Fisheries Partnership's Fishsource website as their primary source of information on assessed stocks. This is because it provided risk assessment information and scores for both stock status and fisheries management. The main needs not served by this site were environmental aspects and information on stocks which were not assessed. For aquaculture the main approach was the use of internal and external standards to control risks. This group percieved the Seafish responsible sourcing guides mostly as a

source of background information on assessed stocks and of information on non assessed species and environmental effects.

Smaller processors (less than £m60 turnover in seafood product per annum) tend to rely on current fisheries management systems to assure sustainability, rather than make their own risk assessments although some have developed their own approaches. The most important use they have for the Seafish responsible sourcing guides is for communication with other parts of the supply chain, not necessarily represented in this survey. Some of this group valued the concise self contained nature of the guides as an aid to communication with collegues.

The small sample from the restaurant sector were interested in communication with customers and suppliers, and would be more interested in material such as posters, leaflets and with a style which would be suitable for wider communications than the Seafish responsible sourcing guides. If they drew on information on sustainability it would be from the Marine Stewardship Council website on certified product, or Marine Conservation Society fishonline.

The survey produced several suggestions for collaboration with other sources such as Fishsource, and the setting up of a ‘desktop’ from which many sources of advice could be drawn on to assist decision making. Presenting information which can be readily assimilated into the risk management systems should be useful in assisting information flow up and down the supply chain

9. Recommendations

- This and other information should be used to inform on principles for responsible sourcing within Seafish and its advisory role

- Whilst there is the possibility of further responsible sourcing guides to cover species with assessments, for information poor stocks a more productive approach would be to develop generic methods for risk assessment for application to information poor stocks and ecosystems.

- The sectors interviewed differed in their use and preferred method of presentation of information.

    - Smaller processors (less than £m60 turnover per annum) relied on their suppliers and the Seafish responsible sourcing guides for information and decision making and used the guides to communicate with customers. They valued the self contained, concise nature of the guides for this purpose. It is recommended that the format of the guides remain substantially as it is for this group.

    - Larger processors (more than £m60 turnover in seafood pa) and retailers tended to use more structured decision making using methodology involving risk assessments and decision tree approaches. They used a diversity of sources and were interested in a countering a variety of stock depletion, fisheries management and environmental risks. It is recommended that the possibility of collaboration with other sources such as Sustainable Fisheries Partnership organisation be explored in order to examine the feasibility of making the guides a gateway to enabling access to other sources of information. This is a relatively long term task.

    - In the short term is recommended that the responsible sorcing guides provide a rigorous commentary on stock status, management and ecological risks possibly within a more

structured layout than at present to improved information for decision makers.

- The restaurant sector particularly fish and chips shops are more interested in visual media such as posters and leaflets to illustrate fisheries assessment, management and sustainability. They use trade associations and magazines as important sources of information. It is recommended that these approaches are used in preparing information for this sector.

- For consumers, there are a variety of opinions expressed on the viability of Seafish informing this group. It is recommended that these and the rest of the report is made available to those with expertise in this field.

10. List of organisations and websites

All accessed September 2010

BRC British Retail Consortium www.brc.org.uk

CEFAS Centre for Environment, Fisheries and Aquaculture Science www.cefas.co.uk

CITES; Convention on Trade in Endangered Species of Wild Fauna and Flora www.cites.org

Council of Fisheries Ministers; European Union body which has the power to legislate on fisheries management in the European Union

European Union; http://europa.eu/

FAO; Food and Agriculture Organisation of the United Nations www.fao.org

Fishbase www.fishbase.org

Friends of the Sea www.friendofthesea.org

Global Aquaculture Alliance (GAA) www.gaalliance.org

Global Good Agricultural Practice (GAP) www.globalgap.org

Greenpeace International www.greenpeace.org

Icelandic Marine Research Institute www.hafro.is

ICES; International Council for the Exploration of the Sea. www.ices.dk

Icelandic Government http://www.fisheries.is/

IUCN red list of threatened and endangered species www.iucnredlist.org/

Marine Conservation Society (MCS) www.mcsuk.org

Marine Conservation Society Fishonline www.fishonline.org

Marine Stewardship Council www.msc.org

Monterey Bay Aquarium (MBA) www.montereybayaquarium.org

Norwegian Government www.fisheries.no/

Responsible Fishing Scheme (RFS) http://rfs.seafish.org/

Responsible Icelandic Fisheries www.responsiblefisheries.is

Royal Forest and Bird Protection Society of New Zealand www.forestandbird.org.nz

Sea Fish Industry Authority; Seafish. www.seafish.org, www.seafish.org/b2b

Seafood Choices Alliance www.seafoodchoices.com

Sustainable Fisheries Partnership www.sustainablefish.org

Sustainable Fisheries Partnership; Fishsource www.sustainablefish.org/main/fishsource

The Blue Ocean Institute www.blueocean.org/home

World Wide Fund for Nature www.wwf.org

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Sheffield Hallam University

Faculty of ACES

An investigation into the information requirements of businesses sourcing sustainable seafood;

Appendices

by

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September 2010

A dissertation submitted in partial fulfilment of the requirements of the Sheffield Hallam University for the degree of Master of Science in Applied Statistics

Appendix I; Example responsible sourcing guide

See www.seafish.org

Appendix II; First pilot

The first pilot questionnaire is shown below. In blue are the notes for the person administering the survey and in red are the respondents' answers.

Establish the respondents' role in the Seafood market

1. We would like to ask you your views on the Responsible Sourcing Guides (RSGs) and the Responsible Fishing Scheme (RFS). The Responsible Sourcing Guides are designed to provide information on fish stock sustainability and fisheries management and the Responsible Fishing Scheme is designed to ensure standards are met on board fishing vessels. Both the guides and the scheme have been around for three to four years and we (Seafish) would like to know more about how they are used.

a. Nature of business

Tick all which apply

1st buyer ✓
Importer ✓
Processer ✓
Foodservice Produce for
Retailer monger
Retailer multiple supermarket Produce for
Fish and Chips Produce for
Foodservice hotel and catering

……other

b. Turnover on Seafood products per annum

Tick box which apply

£0-£100,000
£100,000-£1 million
£1 million - £10 million ✓
£10 million - £100 million
£100 million - £1000 million

c. Wild caught species supplies

Percentage of turnover……100…….
Top five species ranked by value
1 …… Cod
2 …… haddock
3 …… Redfish
4 …… Saithe
5 ……

d. Aquaculture species

Percentage of turnover……0……..
Top five species ranked by value
1 ……..
2 ……..
3 ……..
4 ……..
5 ……..

e. Imported species

Percentage of turnover……100……..
Top five species ranked by value
1……
2……..
3 …….
4 …….
5 …….

f. Products

Product	**Percentage of Annual sales**
Whitefish	
Exotic fish	
Chilled unprocessed	
Frozen processed	100% whitefish frozen
Others (please specify?)	
Redfish (small amount)	

Principles

Elucidate the respondents' understanding of the main sustainability issues relating to fisheries and their degree of risk tolerence to fisheries and aquaculture sustainability.

2. Before going into detail, we would like to ask for your views on a number of topics concerning fisheries and aquaculture sustainability

a. **Wild caught seafood;** For each of the following statements please mark the rating category which most represents your views

	Strongly agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Favour of precaution**
1. Responsible sourcing requires only that product is sourced from a legal catch	✓					--
2. Even when stocks are low, fish may be responsibly sourced from a fishery if the managers and fishers behave in a way that will lead towards stock recovery	✓					--
3. Non-Governmental Organisations (NGOs) such as Marine Conservation Society (www.fishonline.org) have too great an influence over the market for fish	✓					--
4. The influence of NGOs is essential because they are independent of Government and industry				✓		+
5. The use of ratings such as fishonline's 1-5 scheme is a conveinient way of assessing fisheries sustainability				✓		+
6. The use of ratings can result in an over simplification of the situation of a fishery.	✓					--

Not attempted (missed page)	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Favour of precaution +
7. Third party Certified fisheries (such as MSC[1]) have the best chance of sustainability						+
8. Third party Certification is not necessary to ensure sustainability in fisheries; action by industry and Government should be enough						
9. There is always going to be a compromise in terms of sustainability of individual stocks in mixed fisheries, because different fish stocks are likely to be in different states of health						--
10. Responsible souring means sourcing from fisheries where all species are inside safe biological limits						+
11. As long as the gear used is legal we would source from vessels using it						--
12. We avoid certain gear types because we do not consider them environmentally friendly						+

[1] Marine Stewardship Council

b. Who should assume responsibility for ensuring fish Stocks are not overused?

Organisation	**Rank**
The fishing industry	1 Abide by sensible practices
Governments of countries	0; but they have power
Fish manufacturers and processors	2 Give correct information do not break rules
People who buy or eat fish	0 Point of sale should be no worries
Non-governmental organisations	0 use correct information
Cross disciplinary groups such as the Seafish Common Language group	1 Set ip core values
Retailers of fish products	2 Abide by rules
Others Scientists	1 Produce information

c. Aquaculture
First pilot did not source aquaculture products

Objectives

Enquire what factors are driving the respondents' need to take sustainability issues into account in their sourcing policies. This would include an understanding of the respondents' perceptions of market, investment and supply risks in relation to sustainability.

Construct; those who are targeting the sustainable market vis those who simply see sustainabilty issues as an irritation

3. We would like to know something of the factors which are behind your need to take sustainability information into account when trading in seafood.

	Strongly agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**+ sustainable market -- irritation**
1. We take sustainability issues into account because our customers trust us to source only sustainably sourced fish	✓					+
2. We are actively promoting ourselves as a source of sustainbly sourced fish		✓				+
3. We need sustainable sourcing information because our buyers demand it	✓					--
4. Sustainability issues are here to stay so we have invested time and energy in understanding these issues	✓					+
5. Sustainability issues have been forced on us in recent years, we do not think that they are important for our supplies					✓	--

4. Could you give us some indication of how you percieve the risks attached to not taking sustainability factors into account when trading in Seafood?

Please rank the risks and then indicate what level of risk tolerance you consider you can accept

Risk	**Rank**	**Risk tolerance**
Risk of adverse consumer perception	3	
Risk of resource depletion	1	
Risk of fish shortage	2	
Risk of loss of investor confidence		
Other risks		

Information sources/indicators

Enquire what expectations the respondents' have for information sources and how the various sources available fulfill these requirments. This would include a discussion of options for the use, format and possible development of the Responsible Sourcing Guides both to inform industry **and further guides to inform consumers.** Also 'points systems' approaches to sustainability information would be considered.

Construct, from good understanding and information on fisheries science and traceability to those with no skills and no traceability information

5. We would like to know your views on the information which you already use for responsible sourcing and how you think Seafish should develop its approach to information on responsible sourcing

    a. For each of the following statements please mark the rating category which most indicates your veiws

	Strongly agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Well informed+ Not well informed -**
1. I have enough information on stock status and traceability to make good judgements on sustainability issues				✓		+
2. I do not have enough traceability information from my suppliers to be able to obtain sustainability information on a stock by stock basis					✓	-
3. There are some species I would like to trade in but do not have enough sustainablity information to trade in confidently			✓			-
4. I would like to obtain more information about the ecosystem effects of the fisheries from which I source my fish			✓			+
5. I would like more information on the socail and economic factors affecting the fisheries from which I source my fish			✓			+

List the specific fisheries, species and stocks which you would like more information on

6. We would like information on the tools, mechanisms and information sources which you used to help you source responsibly
    a. Rank (put 0 if not used) your use of information sources for responsible sourcing

Other use could include –

1. Information in house
2. Informing customers
3. Public relations
4. Other

Organisation	Rank	Other use and comments
Scientific organisations such as ICES www.ices.dk	1	
Seafish; Responsible Sourcing Guides www.seafish.org/b2b/rss	2	
Seafish; Direct contact with Seafish staff	2	
Seafish; other information www.seafish.org		Not a lot
Greenpeace International		Get information about Greenpeace on news
World Wide Fund for Nature (WWF); International		Not in my current job
Marine Conservation Society; www.fishonline.org/		Only looked once; to look for new species
Monterey Bay Aquarium www.montereybayaquarium.org/cr/seafoodwatch.aspx	No	
Sustainable Fisheries Partnership (Fishsource) www.sustainablefish.org/		Only when shown by Bill

Organisation	**Rank**	**Other use and comments**
NOAA Fisheries FishWatch www.nmfs.noaa.gov/fishwatch/		
Others; from web		
Others; direct contact with organisation's staff		

Comments

7. Seafish would like to develop the Responsible Sourcing Guides to make them more useful to industry, we would like your views on the various parts of the guides, and on features on other guides which we could potentially incorporate.

    a. Rate information parts of guides; which features of the Responsible Sourcing Guides are most important to you? (Please rate the information – 1 = info is not useful, 5 = info is very useful)

Feature	**Rate**
Introduction	All useful
Buyers' top tips	All useful
Stock status tables	All useful
Fisheries and Research	All useful
Management and conservation	All useful
Product characteristics	All useful
References	All useful

    b. Please list any other aspects which you think should be included in the guides

Ask Director of the firm; he wanted forward projections for catches

_____

_____

_____

    c. Please list new species and groups of species you would like to see guides on (Information will include a list of the guides)

No extras_____

_____

_____

_____

    d. Please list any other topics useful to responsible sourcing which you would like covered (information will include a list of fact sheets) No
    e. General comment; found the Responsible Sourcing Guide a very informative document, short enough not to spend hours looking through

8. Currently the main target of the Responsible Sourcing Guides and other responsible sourcing information is to inform businesses in the supply chain. One option for Seafish would be to develop its Responsible Sourcing information to make it more useful for consumers.

   a. Would you use such guides if they existed?_____No_____

      _____
      __

   b. Do you use the current Responsible sourcing guides to inform consumers?_____No_____

   c. If you do use the guides to inform consumers, what are your experiences?

      _____N/A_____

      _____

      _____

      _____

   d. Any other comments_____Consumers only need to know that the fish is sourced correctly. Certain people can afford to be concerned, up to us to make it safe

      _____

      _____

   e. Would you support a transparent scoring system, based on standards for these consumer guides?

Need one set of rules not confusion_____

_____
_____

8. Various methods are available for delivery of information for responsible sourcing. We would like to be able to set priorities for Seafish. Please rank the following methods;

Delivery	Rank	Comment
Online searchable database type information; look up species stock and gear	2	Is information up to date
Fact sheet approach; as in Reasponsible Sourcing guides	1	
Direct contact with specialist staff	1	
Voicover powerpoint presentations	Pass	
Other		

9. Please rank the relative relative utility of the different features of the various guides. Indicate those which you would not like to see in the Seafish Responsible Sourcing Guides Not responded to

Feature	**As in**	**Rank**	**Would like to see in RSGs**	**Would not like to see in RSGs**	**Comments**
Attractive print out; prints out information by species	Seafish Responsible Sourcing Guides				
Authortitive background information	Seafish Responsible Sourcing Guides				
Stocks are rated by assessment information only; no other scoring system used	Seafish Responsible Sourcing Guides				
Filter scheme; easy to find the stock you require	www.Fishonline.org www.fishsource.org				
Filter scheme; can find information by stock, fishery and gear	www.fishsource.org				
Scoring system based on organisation's own criteria	www.Fishonline.org				
Scoring system based on criteria explained alongside the scores	www.fishsource.org				
Fish to avoid lists	www.Fishonline.org/ www.montereybayaquarium.org				
Fish to eat lists	www.Fishonline.org/ www.montereybayaquarium.org				
Graphical representation of time series trends	www.fishsource.org				
Tabed page information	Seafood scotland				

Standards

10. Gain an understanding of the respondents' sourcing policy and the role of information sources and standards such as the responsible fishing scheme in relation to sustainability

    a. Do you have a written policy on purchase of Seafood relating to sustainablity
    Yes
    No ✓ however we do abide by the rules, see below
    If yes is it publically available?
    Yes
    No

List the criteria used;

Criteria	
Do you specify that stocks should be inside Safe biological limits?	
Other limits	
Fish to quota	Fishing Greenland stock- query; is the science good on this stock
Scores by www.fishonline.org	No; too much information
Scores by www.fishsource.org	No
IUCN red list	No
Others	
ICES recommendation	Fishing Greenland stock- query; is the science good on this stock
Do you specify that fish should only be from certain gear types?	Only that they should be legal
Other criteria Specify	

b. How much of your product conforms with the following standards?

Eco-labelling schemes

Scheme	**Percentage use**
Marine Stewardship Council	None at present
Friends of the Sea	
Global Aquaculture Alliance (GAA) and Global GAP	
Responsible Fishing Scheme	No because origin of fish is not UK
Other; please list	

Responsible fishing scheme

11. The Responsible Fishing Scheme (commonly referred to as RFS) is designed to show that skippers are ensuring that all operations of their vessel conform to industry good practice and working within the management regime.

    a. Are you aware of RFS?

Yes – heard of it and think it's a good idea	
Yes – heard of it but don't think it's a good idea.	
No – I've never heard of it.	

    b. Do you purchase raw materials from RFS certified vessels for processing in your business?

Yes	
No	
Don't know	

Why?

    c. If yes do you know what proportion of your product originates from RFS certified vessels?

We use BRC (British Retail Consortium) Standards

d. Which are the most important features of the RFS to your business? Please rank the following in terms of importance (1=Not very important, 5=Very important)?

Feature	**Importance**
All vessels are Independently audited (e.g. by Moody Marine and not Seafish)	
The fact that it's based on a Publicly Available Specification from British Standards	
Chain of custody	
Communication on pack	
The backing of Seafish	

Comment:

c. What difference does sourcing materials from RFS vessels make to your business? (Prompts: does it...give confidence to your customers, allow you to secure contracts wouldn't otherwise get, guarantees quality, allows you to charge a premium price, etc?)

d. In your opinion, what differences do you think RFS brings to the catching sector? (Prompts: does it...make vessels stand out amongst suppliers…. Improve quality...develop a good reputation...build trust...allows them to achieve a higher sales price etc?)

e. What could be done to improve the RFS?

(prepared prompts e.g. internationalisation of scheme, improved chain of custody, raising awareness with retailers, raising awareness within foodservice sector, raising awareness with consumers, link with other schemes, etc*)*

f. Should RFS become more specialised for vessels working in specific fisheries, particularly where environmental issues are of importance?

Other comments

Send information on Responsible Sourcing Guides on ealert as they happen

Appendix II Second Pilot

Establish the respondents' role in the Seafood market

1. We would like to ask you your views on the Responsible Sourcing Guides (RSGs) and the Responsible Fishing Scheme (RFS). The Responsible Sourcing Guides are designed to provide information on fish stock sustainability and fisheries management . The guides and the scheme have been around for three to four years and we (Seafish) would like to know more about how they are used.

a. Nature of business

Tick all which apply

Role	Buy	Sell to
1st buyer	✓	
Importer	✓	
Processor	✓	
Foodservice	✓	
Retailer monger		✓
Retail multiple supermarket		✓
Fish and chips		✓
Retail hotel and catering		
Other 2		
Other 2		

_____Other

b. Turnover on Seafood products per annum

Tick box which apply

Turnover	
£0-£100,000	
£100,000-£1 million	
£1million-£10million	✓
£10 million - £20 million	
£20 million - £ 30 million	
£30 million - £40 million	
£ 40 million - £50 million	
£ 50 million - £100 million	
£ 100 million - £ 200 million	
£ 200 million +	

c. Wild caught species supplies

Percentage of turnover…….90
Top five species ranked by value
1 ……Haddock
2 …… Plaice
3 ……Halibut
4 …… Dover sole
5 ……Cod

d. Aquaculture species

Percentage of turnover……..10
Top five species ranked by value
1 ……..Salmon
2 ……..Sea bass
3 ……..Gilt bream
4 ……..Trout
5 ……..

e. Imported species

Percentage of turnover……..50
Top five species ranked by value
1……Halibut
2……..Cod
3 …….Plaice
4 …….Lemons sole
5 …….

f. Products (look at list)

Product	**Percentage of Annual sales**
Whitefish	95
Exotic fish	
Chilled unprocessed	
Frozen processed	

2. Have you used or been involved in any of the following activities in the last 3 years?

Activity	Comment
Seafish Common language group or its derivitives (UK scallop group, skates and rays group, Discard action group)	✓
Responsible fishing scheme	✓
Responsible sourcing guides	✓
Contact with Seafish staff via enquiries	✓
Responsible sourcing guides	✓
Contact with Seafish account managers	✓
Seafish website www.seafish.org	✓
Seafood Information network http://sin.seafish.org/	✓
Seafish business to www.seafish.org/b2b	✓
Fish and Chip shop of the year	
The good catch Sustainability Awards (Fish and Chips)	
Other (please specify) Processors and importers forum	✓

Principles

Elucidate the respondents' understanding of the main sustainability issues relating to fisheries and their degree of risk tolerence to fisheries and aquaculture sustainability.

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3. Before going into detail, we would like to ask for your views on a number of topics concerning fisheries and aquaculture sustainability

d. **Wild caught seafood;** For each of the following statements please mark the rating category which most represents your views

	Strongly agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Favour of precaution**
1. Responsible sourcing requires only that product is sourced from a legal catch	✓					--
2. Even when stocks are low, fish may be responsibly sourced from a fishery if the managers and fishers behave in a way that will lead towards stock recovery		✓				--
3. Non-Governmental Organisations (NGOs) such as Marine Conservation Society (www.fishonline.org) have too great an influence over the market for fish	✓					--
4. The influence of NGOs is essential because they are independent of Government and industry				✓		+
5. The use of ratings such as fishonline's 1-5 scheme is a conveinient way of assessing fisheries sustainability				✓		+
6. The use of ratings can result in an over simplification of the situation of a fishery.		✓				--

	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	
7. Third party Certified fisheries (such as MSC[2]) have the best chance of sustainability		✓				
8. Third party Certification is not necessary to ensure sustainability in fisheries; action by industry and Government should be enough				✓		
9. There is always going to be a compromise in terms of sustainability of individual stocks in mixed fisheries, because different fish stocks are likely to be in different states of health		✓				
10. Responsible sourcing from mixed species fisheries means sourcing from fisheries where all species are inside safe biological limits		✓				
11. There is a need to take into account ecological effects when considering fisheries sustainability	✓					
12. Fisheries sustainability should include social and economic effects	✓					

[2] Marine Stewardship Council

e. Who should assume responsibility for ensuring fish stocks are not overused? Please rank the organisations 1 – is most important, ties permitted. And what role should they have?

Organisation	Yes/No	Rank	Role
The fishing industry	Y	1	Information gathering
Governments of countries	Y	1	Sensible legislation
Fish manufacturers and processors	Y	2	Engagement; to pass on information
People who buy or eat fish	N	0	
Environmental Non-governmental organisations	Y	3	Guidance
Cross disciplinary groups such as the Seafish Common Language group	Y	1	Bring commonsense and decision making process to table
Retailers of fish products	Y	2	Engagement and co-operation of with all parties
Scientists	Y	1	Funded accurate assessments
Certifying bodies such as MSC	Y	1	Accurate accreditation
Other			

Objectives

Enquire what are the objectives which respondents are aiming at when taking sustainability issues into account in their sourcing policies. This would include an understanding of the respondents' perceptions of market, investment and supply risks in relation to sustainability.

4. We would like to know something of the factors which are behind your need to take sustainability information into account when trading in seafood.

	Strongly agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**+ sustainable market -- irritation**
1. We take sustainability issues into account because our customers trust us to source only sustainably sourced fish		✓				+
2. We are actively promoting ourselves as a source of sustainbly sourced fish		✓				+
3. We need sustainable sourcing information only because our buyers demand it		✓				--
~~4.~~ Sustainability information is important to us because it enables us to take an active part in the conservation of fisheries resources	✓					+
5. Sustainability issues have been forced on us in recent years, we do not think that they are important for our supplies				✓		--
6. We need an understanding of sustainability issues because there is so much misinformation on sustainability in the public domain	✓					+

5. Could you give us some indication of how you percieve the risks attached to not taking sustainability factors into account when trading in Seafood?

Please rank the risks (1 is most important, ties are allowed; 0 if not important) and then comment if you consider it appropiate.

Wild capture Risks	**Risk Y/N**	**Rank**	**Comment**
Risk of adverse consumer perception	Y	1	
Risk of resource (stock) depletion	Y	2	
Risk of fish shortage (before stock depletion)	Y	2	
Risk of loss of investor confidence	Y	2	
Risk of wasting time and opportunity because of poor information on sustainability issues	Y	1	
Risk of becoming a target for green campagners	Y	1	
Other risks			

Aquaculture risks	**Risk Y/N**	**Rank**	**Comment**
Risk of damage to reputation through adverse ecological effects of aquaculture	N	O	
Risk of poor quality product	N	0	
Risk of contaminated product	Y	1	
Risk of damage to reputation through adverse social and economic effects of aquaculture	N	0	
Other risks (please specify)			

Information sources/indicators

Enquire what expectations the respondents' have for information sources and how the various sources available fulfill these requirments. This would include a discussion of options for the use, format and possible development of the Responsible Sourcing Guides both to inform industry **and further guides to inform consumers.** Also 'points systems' approaches to sustainability information would be considered.

6. We would like to know your views on the information which you already use for responsible sourcing and how you think Seafish should develop its approach to information on responsible sourcing

   b. For each of the following statements please mark the rating category which most indicates your views

	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Well informed+ Not well informed -
1. I have enough information on stock status and traceability to make good judgements on sustainability issues for the fish I source	✓					+
2. Although I know that some of the stocks from which I obtain my fish from are sustainably fished, I do not have enough traceability information from my suppliers to be able to obtain sustainability information on a stock by stock basis	✓					-
3. There are some species and/or stocks which I could trade in with adequate traceability, but I do not have enough sustainablity information to trade in confidently			✓			-
4. I am able to use my traceability systems and knowledge of stock status to trade in species and stocks which others cannot	✓					+
5. There is a serious lack of sustainability information on species and stocks that I trade in				✓		+

List the specific fisheries, species and stocks which you would like more information on

6. Who should assume responsibility for communication with the consumer concerning fisheries sustainability? Please rank the organisations 1 is most important ties allowed. And what role should they have?

Organisation	Yes/No	Rank	Role
The fishing industry			
Governments of countries			
Fish manufacturers and processors			
Seafish			
Environmental Non-governmental organisations			
Cross disciplinary groups such as the Seafish Common Language group			
Retailers of fish products			
Scientists			
Certifying bodies such as MSC			
Other			You have asked me this one! All parties should assume responsibility as custodians of the industry

7. We would like information on the tools, mechanisms and information sources which you used to help you source responsibly. Please list your information sources in ranked order of importance 1 is most important with any comments you may have

Organisation	Rank	Comments
Seafish	1	
Fishonline	3	
Source of product (suppliers)	2	

Comments

8. Seafish would like to develop the Responsible Sourcing Guides to make them more useful to industry, we would like your views on the various parts of the guides, and on features on other guides which we could potentially incorporate.

   a. When did you last use the Responsible Sourcing Guides?

   b. Which one(s)……Dover Sole, skates and rays, haddock, cod
   c. For what purpose…Passing information on to customers……

   d. Rate information parts of guides; which features of the Responsible Sourcing Guides are most important to you? (Please rate the information – 1 = very useful, 5 = info is not very useful; ties allowed)

Feature	**Rate**	**Comment**
Introduction	1	
Buyers' top tips	1	
Stock status information	1	
Stock status tables	1	
Fisheries and Research	1	
Time series graphs (not all guides)	1	
Management and conservation	1	
Product characteristics	1	
References	1	Particularly good, shows that information is well founded

   a. Please list any other aspects which you think should be included in the guides

_____

_____

_____

b. Please list new species and groups of species you would like to see further information on

_____

c. Please list any other topics useful to responsible sourcing which you would like covered (information will include a list of fact sheets)

_____

_____

_____

9. Various methods are available for delivery of information for responsible sourcing. We would like to be able to set priorities for Seafish. Please rank the following methods 1 most important ;

Delivery	Rank	Comment
Online searchable database type information; look up species, stock and gear	3	Difficult to trawl
Fact sheet approach; as in Reasponsible Sourcing Guides	1	Excellent for getting to the crux of the issues
Direct contact with specialist staff	1	First class and engaging
Other		

Standards

10. Gain an understanding of the respondents' sourcing policy and the role of information sources and standards such as the responsible fishing scheme in relation to sustainability

    g. Do you have a written policy on purchase of Seafood relating to sustainablity
    Yes ✓
    No
    If yes is it publically available?
    Yes ✓ but under review
    No

List the criteria used;

Criteria	
Do you specify that stocks should be inside Safe biological limits?	Y
Other limits	Chain of custody required
Scores by www.fishonline.org	N
Scores by www.fishsource.org	N
IUCN red list	N
Others	
Do you specify that fish should only be from certain gear types?	For certain species; example not beam trawl Dover Sole
Other criteria Specify	

11. How important for do you consider sustainability scores as used by

Organisation	**For sourcing**		**For consumer information**	
	Yes/No	Comment	Yes/No	Comment
MCS (www.fishonline.org)	N	But we do track	No	
Fish source www.sustainablefish.org/		Not Familiar	No	
Other				

12. **Please indicate the proportion of your sources conforming to the following standards**

Scheme	**Percentage use**
Marine Stewardship Council	
Responsible Fishing Scheme	80-90 because it is UK fish (guessed at)
Others please specify	

13. **Any other comments**

_____

_____

_____

_____

_____

Appendix IV Coefficient of concordance for vague data

This coefficient was calculated from Grzegorzewski (2006). Each ranked item for each respondent is scored with two scores, numbers of items worse and numbers of items scored better. Those not ranked are scored as 0,0. Thus the set of ranks below from each respondent Ai would be scored in the following way:

Organisation	Rank	Better than bAj	Worse than wAj
Governments of countries	1	0	8
The fishing industry	2	1	7
Scientists	3	2	6
Certifying bodies such as MSC	4	3	5
Fish manufacturers and processors	5	4	4
People who buy or eat fish; consumers	6	5	3
Environmental NGOs	7	7	2
Multi stakeholder working groups	8	8	1
Retailers of fish products	9	9	0

Scored ranks resulting from ties and missing values were scored as follows;

Organisation	Scored Rank	Better than bAj	Worse than wAj
Governments of countries	2.5	0	4
The fishing industry	2.5	0	4
Scientists	2.5	0	4
Certifying bodies such as MSC	2.5	0	4
Fish manufacturers and processors	6	4	1
People who buy or eat fish; consumers	6	4	1
Environmental N	6	4	1
Multi stakeholder working groups	8	7	0
Retailers of fish products		0	0

For each respondent A the functions

$$\mu Ai\,(xj) = \frac{wAi\,(xj)}{n-1} \quad \text{and} \quad vAi\,(xj) = \frac{bAj(xj)}{n-1}$$ were calculated

Where bAj and wAj were calculated as above and n is the number of elements ranked. Both μAi (xj) and vAi (xj) were summed over all of the observers and then divided by k the number of observers ;

$$\mu A\,(xj) = 1/k \sum_{i}^{k} \mu A\,(xj) \text{ and } vA(xj) = 1/k \sum_{i}^{k} v(xj)$$

The coefficient of concordance is calculated

$$W(Ai\ldots\ldots Ak) = \frac{6(n-1)}{n(n+1)} \sum_{j=1}^{n} [\,(\mu A\,(xj)-1/2)^2 + (\mu A\,(xj)-1/2)^2\,]$$

Reference

Grzegorzewski, P. (2006). "The coefficient of concordance for vague data." Computational Statistics & Data Analysis **51**: 314 - 322.