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An Evaluation of Sustainable Seafood Guides: Implications for Environmental Groups and the Seafood Industry

CATHY A. ROHEIM
University of Rhode Island

Introduction

The mid-1990s marks the inception of the sustainable seafood movement (McGovern 2005). The sustainable seafood movement is represented by several approaches toward creating demand for sustainable seafood, including boycotts, seafood guides, and ecolabeling (Roheim and Sutinen 2006). The first sustainable seafood guide was launched in 1998 in *Audubon* magazine with a ranked list of seafood, intended to provide consumers with information to make environmentally benign seafood purchasing decisions (Safina 1998). Seafood guides provide a ranking process, based on methodology and criteria that evaluate environmental and biological criteria of species, fisheries, or aquaculture practices. The rankings are summarized in a traffic light system of red (items to avoid), yellow (good alternatives), and green (best choices). Some of the criteria considered for ranking each species from capture fisheries include: how it responds to fishing pressure, abundance, gear impacts, by-catch, and management (EDF 2008). Issues upon which they determine rankings for aquaculture include: system design, feed content, water pollution, risk to other species, and ecosystem effects. A red list item is subject to one or more serious problems such as overfishing; high by-catch; serious habitat damage; poor management; or farming methods that have serious environmental impacts, such as widespread pollution, the spread of disease, chemical use, and escaped fish. Yellow list items have fewer problems, but may have problems with their management, how they are caught or farmed or the health of the habitat. Green list items are either wild fish from healthy, well-managed populations, caught using fishing gear that does little harm to sea life and marine habitats; or farmed fish raised in systems that control pollution, the spread of disease, chemical use, and escaped fish.

In recent years, the number of sustainable seafood guides internationally has grown to approximately 200 (Seaman 2009). The traffic light system remains, as has the primary function—to influence consumers' decisions toward purchasing seafood on the green list and away from purchasing from the red list to improve the sustainability of the ocean environment. The most well-known guide is perhaps that of the Monterey Bay Aquarium (MBA) under the Seafood Watch program (Kemmerly and Macfarlane 2008). One of

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Cathy A. Roheim is a professor in the Department of Environmental and Natural Resource Economics at the University of Rhode Island, Kingston, RI 02881 USA (email: crw@uri.edu). The author acknowledges funding from King's Seafood Company and Rhode Island Sea Grant and assistance from Michelle Armsby, graduate research assistant and URI Sustainable Seafood Fellow, in the completion of this research.

the formats of this guide and many of the others are a pocket guide (or wallet card). Wallet cards are a handy method of reaching and educating consumers, as they are easily distributed. Consumers may carry them in their wallets or purses and consult them as they make purchase decisions while at their supermarket or restaurant. MBA distributes its cards to visitors at its aquarium and through partnering with zoos, aquariums, and other institutions.

Approximately 20 million MBA wallet cards have been distributed since the program's inception, far more than any other cards (Kemmerly and Macfarlane 2008; CCIF 2009). In addition, of the 200 or so guides produced internationally, several are clones of the MBA guide, relying on the recommendations from MBA for their rankings. Thus, the reach of the MBA is quite large. There are, however, several guides that are independently researched. These include, but are not limited to, those by the Marine Conservation Society (MCS) in the U.K., the Blue Ocean Institute (BOI) and Greenpeace in the U.S.A., and Sea Choice in Canada.

Species ranking has not been without controversy. First, there is disagreement over its validity by the seafood industry. What is viewed as an unsustainable item by environmental groups often conflicts with views of sustainability by the industry, fisheries managers, or aquaculture producers. Secondly, different organizations may have differing scoring mechanisms by which to evaluate species, the environment, or fishing and aquaculture practices. This was especially true in the early years of the guides, resulting in many conflicting recommendations. The perception that these guides do more to confuse consumers than assist them is pervasive (Seaman 2009). A recent poll of readers of a major seafood industry web-based trade newsletter indicates that 72% of those who voted believe the guides confuse consumers (*IntraFish Media* 2009).

What have been the effects on the markets of these guides? Seafood sourcing by large corporations has been significantly altered based upon the rankings in the guides. As one example, Compass Group North America is a major foodservice company with revenues of over $9 billion in 2008 (Compass Group 2009a). It is one of several foodservice corporations globally which is now basing its seafood procurement policies upon the MBA Seafood Watch program (Compass Group 2009b). In 2009, Compass Group claimed that 70% of seafood procured was sustainable (non red-list items), and that it had distributed almost 1 million Seafood Watch cards to its customers (Compass Group 2009b). According to its press release, Compass Group said it had "decreased its unsustainable shrimp purchases by 835,000 pounds and decreased its unsustainable salmon purchases by 192,000 pounds, while increasing its purchasing of sustainable (wild) salmon by 49%. This was most challenging due to the popularity of both species with consumers and the lack of consensus among conservationists about what sustainably farmed seafood and salmon means" (see Compass Group 2009b). Clearly, MBA has had an impact on purchasing farmed shrimp and salmon, with significant implications for the economic viability of both industries if this behavior is to spread to other major foodservice operators globally, as well as other consumer-facing corporations.

Aside from the large distribution of cards to consumers, little is known about actual changes in consumer purchasing behavior. In one evaluation, Kemmerly and Macfarlane (2008) found, in a follow-up study of 400 visitors to the Monterey Bay Aquarium who received the guide and were surveyed four months later, that buying habits had changed. In particular, 76% reported that the pocket guide had made them more diligent when inquiring and choosing particular seafood, and/or that they no longer bought specific types of seafood because they were listed in the 'red' or 'yellow' columns. The participants also indicated that restaurateurs and retailers were not always able to answer questions that participants had about where seafood came from or the fishing or farming practices, making it difficult to follow the card's prescriptions.

A more fundamental question is whether the guides are having an environmental impact, as this is, after all, the purpose of their creation. According to Brownstein, Lee, and Safina (2003) the guides are changing fishing industry practices. For example, earlier

in the decade BOI ranked Alaska halibut green, in part because of regulations mandating longliners use albatross-deterrent techniques, something British Columbia regulations did not require. As a result, B.C. halibut had a lower, yellow, ranking. B.C. fishermen reportedly asked the government for regulations similar to Alaska's in order to raise their ranking, and after changes in regulations received a green ranking (Brownstein, Lee, and Safina 2003). The current guide does not explicitly distinguish clearly between Alaska and BC halibut, but appears to refer primarily to Alaska halibut.

Jacquet and Pauly (2007) reach what is likely a premature conclusion that the sustainable seafood movement as a whole (*i.e.*, seafood guides, boycotts, ecolabeling programs) have failed to achieve their environmental goals. One could perhaps argue that the movement is only a decade old, and it is difficult to move the international seafood market during that brief time toward those species defined by the environmental community as sustainable.

However, the purpose of this article is not to evaluate environmental effects of the seafood guides, but rather to analyze the consistency of these guides against one another. The results of such an analysis are presented. It should be clear from the discussion above that: *i)* the guides are having an impact on the market, at least at the corporate level; *ii)* there are those in industry who view the plethora of guides as creating confusion for consumers; and *iii)* the information provided in the guides has significant economic implications for the fishing and aquaculture industries. The results provide not only useful implications for the fisheries and aquaculture producers, who bear either the costs of being put on the red list or gain the benefits of being on the green list, but also provide suggestions for those in the seafood industry who are working directly with consumers struggling to make sense of the confusing messages they are receiving. Finally, recommendations for environmental groups are also provided for ways which might help reduce the economic burden on the seafood industry while still pursuing the market-based approach to improving the ocean environment.

Methodology

Using the Incofish "International Seafood Guide" (www.incofish.org/isfg.php) as an initial starting point, a list of the various seafood guides was compiled. From that list, those that focus primarily on health issues (PCBs and mercury levels in fish or some combination of health and sustainability) were eliminated, as well as guides that state that they were simply following the recommendations of the MBA.[1] As an international list, several guides focus on species native to their respective local waters, while including some highly migratory international fish. For ease of comparison, guides primarily from North America were selected such that a relatively similar list of species would be included. The exception was to include one guide from the U.K., as it includes many international fisheries pertinent to consumers and buyers in the U.S.A. and expands the breadth of methodology and criteria used in the analysis. The resulting list of seafood guides included in the analysis is: the Audubon Society, Blue Ocean Institute, Environmental Defense, Greenpeace, Marine Conservation Society (U.K.), Monterey Bay Aquarium, and Sea Choice Canada (see table 1 for descriptions).[2]

The primary focus of the analysis is on wallet cards, to reflect what a consumer might see if holding several wallet cards at a restaurant or retailer while trying to make a purchase decision. The exception to this is the Greenpeace guide, which is a red list of species to avoid, published on its website. It does not promote any species as sustainable;

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[1] The Incofish website is admittedly also a bit dated, but covers a good number of the international guides.

[2] NMFS 'Fish Watch' is not included as: *i)* it does not produce a ranking of items but rather presents whether fisheries are 'overfished' and subject to 'overfishing', and *ii)* evaluates U.S. fisheries without providing information on imports.

thus it does not have a green or yellow list. It is as much a consumer guide as any of the others, as they market this red list to their membership and, similar to MBA, encourage retailers to remove any red list items from their store shelves. Greenpeace has become an increasingly dominant voice in sustainable seafood education and has produced several rankings of supermarket chains in various countries as to their credibility in sustainable seafood sourcing (Hunter and King 2008; Greenpeace 2009).

Table 1
Description of Seafood Guides Used as Basis for this Study*

Guide Author	Seafood Guide Descriptions and Websites
Audubon Society	The *Audubon Seafood Wallet Card* is produced by the Audubon Society's Living Oceans Program. The information used for this comparison was acquired from the 2004 edition of the wallet card, which at the time the research was done was found at: http://seafood.audubon.org/ This organization has since dropped this wallet card and has recommended its members follow the Monterey Bay recommendations.
Blue Ocean Institute	The Blue Ocean Institute has published the *Guide to Ocean Friendly Seafood* in a wallet size mini-guide. Information within the *Guide to Ocean Friendly Seafood* was updated in September, 2007. It can be found at: http://www.blueocean.org/seafood/
Environmental Defense Fund	The Environmental Defense Fund has created *Pocket Seafood Selector* to aid consumers in choosing seafood. Though this guide was produced in collaboration with the Monterey Bay Aquarium, some recommendations are slightly different than the Monterey Bay Guide. The version of this guide used in this comparison was copyrighted March 2008. It can be found online at: www.edf.org/seafood
Greenpeace	Greenpeace USA, publishes a red list of fish to avoid. This can be found at http://www.greenpeace.org/usa/campaigns/oceans/seafood/red-fish
Marine Conservation Society	The Marine Conservation Society (MCS) is a non-profit organization based in the United Kingdom. The MCS *Good Fish Guide* provides UK consumers with a guide to sustainable seafood, with some items applicable to the U.S. market. The pocket guide is an abbreviated version of *FishOnline*, a more comprehensive online guide to eco-friendly seafood. The version used for this study, The MCS *Good Fish Guide*, created in 2006, can be found online at: http://www.fishonline.org/advice/avoid/
Monterey Bay Aquarium	The Monterey Bay Aquarium through their Seafood Watch Program produces national and multiple regional guides. Information on mercury contamination of the seafood listed was provided as a result of collaboration with the Environmental Defense Fund, which is disclosed on each of the guides. This comparison utilizes all Seafood Watch Guides (regional and national). This version, updated in April 2008, is available online at: http://www.mbayaq.org/cr/cr_seafoodwatch/download.asp
SeaChoice-Canada	SeaChoice is an initiative of Sustainable Seafood Canada, a Canadian conservation organization providing information to consumers about sustainable seafood in the Canadian market. SeaChoice has produced a pocket guide entitled *Canada's Seafood Guide*. The version used in this comparison was last updated in April 2008 and can be found online at: www.seachoice.org

* pdf copies of the exact guides used in this study may be obtained from the author if otherwise not obtainable.

The analysis presented herein is based on the rankings of the guides available in summer 2008. Organizations continually update rankings; hence, the current 2009 rankings may now be different. However, the general results and implications from those results are not likely to be affected until significant changes occur in the way in which the items are specified. This will become more apparent below.

Both Audubon and BOI used a variant on the standard ranking system, in which there were shades of chartreuse (green turning to yellow) and orange (yellow turning to red). To simplify the analysis and keep it consistent with the other guides, whatever was ranked as chartreuse by the organization was categorized as green, and if it was ranked as orange, it was categorized as red.

The species (items) listed were taken verbatim from the wallet cards themselves. Where there was clear consensus across groups of seafood rankings, these species were put into spreadsheets marked as consensus green, yellow, or red. There are also cases where there appears to be distinct non-consensus among the groups. Finally, another category was created to handle those cases in which consensus was too difficult to determine, due to the level of differentiation attributed to each item by the different groups according to catch area, country of origin, or gear type. These items were put into a separate list, entitled 'Too Tough to Call: Differentiation by Area, Gear Type or Other.'

Evaluation

The overall results indicate that there is perhaps more consensus among the lists than is commonly attributed to them. It may well be that memory of earlier differences among the lists persist in the minds of the industry, and given the length and number of the lists, few have taken the time to do an in-depth comparison, such as that reported upon in this study, to determine just how much consensus really exists. Where consensus is lacking, it may come from several possible sources. First, Greenpeace, as an organization, often takes a more stringent view compared to other environmental organizations, and in the case of these guides, the result is lack of consensus on some items with other environmental groups. Second, while most groups have similar methods and criteria, their interests in particular fishing methods, aquaculture practices, or countries of origin may be slightly different, leading to variety in gear types, catch areas, and/or countries of origin. Thus, the differentiations which make finding consensus between groups difficult may be the result of differing objectives of each organization. Finally, each group has its own membership, and as a result needs to differentiate themselves slightly to maintain their own identity to generate membership dues. It may not in their best interest to duplicate the rankings entirely, as then each may lose its identity or lose the loyalty of its membership.

To illustrate the results, table 2 shows a selected list of items on which the groups show consensus in their rankings. Table 2 simplifies the labeling of the items across the guides to conserve space. For example, while catfish achieves a green ranking, depending upon guide, catfish is alternately referred to as simply 'catfish' or as 'catfish, farmed;' 'catfish, U.S.;' and 'catfish, U.S. farmed.' Clearly, mandatory country-of-origin labeling (COOL), which requires retailers to provide information whether a product is farmed or wild and its country of origin, is critical in this instance if a consumer is to find 'sustainable' catfish. Without such labeling, consumers would be hard pressed to differentiate U.S. channel catfish from imported Chinese channel catfish, with its implied less favorable status.

With respect to the red list, it is interesting to note that only the Marine Conservation Society (MCS) in the U.K. provides support to the Marine Stewardship Council's (MSC) certification of the South Georgia Patagonian toothfish (Chilean sea bass) fishery. Its guide is the only one that indicates all toothfish, except that which is MSC certified, is on the red list. The North American guides make no such distinction.

Table 2
Selected List of Consensus Items

Green List	
Arctic char, farmed	Mussels, farmed
Catfish, U.S. farmed	Oysters, farmed
Caviar, U.S. farmed sturgeon	Salmon, wild Alaskan
Clams, farmed	Shrimp, pink Oregon
Cod, Pacific longline	Striped bass, wild and farmed
Crab, Dungeness	Tilapia, U.S. farmed
Yellow list	
Catfish, Vietnamese (basa/tra/swai) farmed	Sablefish
Cod, Pacific trawled	Shrimp, wild U.S.
Crab, blue	Shrimp, northern U.S. and Canada
Crab, snow	Sole, Pacific
Haddock, hook and line	Tuna, canned
Oysters, wild	
Red List	
Caviar, wild sturgeon	Orange roughy
Chilean seabass/toothfish	Salmon, Atlantic farmed
Cod, Atlantic	Shrimp, imported farmed and wild
Flounder, Atlantic	Skate
Grouper	Snapper
Haddock, trawled	Sole, Atlantic
Halibut, Atlantic	Tuna, bluefin

The list of items which show clear non-consensus is relatively short. It consists of Alaska pollock (even that which is MSC-certified from Alaska), monkfish, farmed shrimp from the U.S.A., and farmed rainbow trout. With respect to Alaska pollock from the MSC-certified fishery, most of the guides give it a green ranking; however, Greenpeace continues to place it on their red list due to concerns about overfishing and ecosystem impacts. BOI gives monkfish a solid yellow ranking, while the other environmental groups give monkfish a red ranking. EDF gave farmed shrimp from the U.S.A. a green ranking, while MBA lists it as yellow. While the criteria for ranking are generally the same across organizations, these differences in rankings are often a result of assignment of different scores in each of the criteria. In other words, different groups may weight various concerns more heavily, bringing down the score and hence the ranking.

In combination, the above highlights a particularly interesting outcome regarding shrimp. Shrimp, in some form, appears as a green, yellow, red, and non-consensus list item (see table 2). Generally speaking, farmed shrimp imported from outside the U.S.A. is on the red list for all groups, together with tropical wild shrimp. Wild U.S. shrimp tends to appear on the yellow lists, while certain wild shrimp in North America are on the green list, including pink shrimp from Oregon and northern shrimp. The non-consensus shrimp is the U.S. farmed shrimp. Again, a consumer or seafood buyer would rely heavily on COOL, which not only requires labeling of country of origin but also production method (farmed or wild), in order to sort through the morass of potential green, yellow, or red rankings above.

As noted in the methodology section, there were a number of items for which it was simply too difficult to determine if consensus existed due to differential descriptions of

similar items. For example, table 3 illustrates a capture fishery item, swordfish, in which its rankings fall into every color—dependent upon gear type, catch area, and country of origin.[3] Each group differentiates the various fisheries quite differently. Some groups believe U.S. fisheries are well managed, while others do not. The list seems to indicate that the environmental groups believe many fisheries outside the U.S.A. are not well managed. Preferred gear types include targeted gear such as harpoon and longline. While these fisheries' attributes are those to which consumers can be educated, if they are to look for seafood with these attributes in supermarkets and restaurants, it may be difficult to find.

Table 3
Example of a 'Too Tough to Call' Capture Fishery Item

Item	Ranking	Guide
Swordfish	yellow	BOI
Swordfish (Canada)	green	MBA
Swordfish (Canada, harpoon)	green	SeaChoice Canada
Swordfish (U.S.)	yellow	EDF
Swordfish (U.S. harpoon)	green	MBA
Swordfish (U.S. longline)	yellow	MBA, SeaChoice Canada
Swordfish (imported)	red	EDF, MBA
Swordfish (Canada, SE Atlantic Mediterranean, longline)	red	SeaChoice Canada
Swordfish (North and South American)	red	Greenpeace
Swordfish (except from U.S. managed fisheries)	red	MCS

Implications

Which species is determined by the environmental community to be on the green, yellow, or red list is a controversial issue, and generates significant costs to the seafood industry if one happens to be placed on the red list. For example, should farmed shrimp and salmon be on the red list? Certainly, some farmers' practices are more environmentally benign than others, yet all are painted with the same brush of being on the red list; thus, all producers bear economic costs, regardless of their practices, and the responsible producers are not rewarded for their extra investment in sustainable production practices.

For the moment, the latter disagreement is set aside, and the implications will focus on to what extent this analysis benefits the consumer or not, taking the current rankings as given. Moving from that point, a number of interesting implications stem from the above analysis for the environmental community and the seafood industry.

Implications for the Environmental Community

With increased propensity on the part of the environmental community to become more specific—focus on catch site, production method, gear type, and sub-species on the various wallet cards—it can create an appearance of non-consensus amongst the organizations making seafood recommendations, and thus the cards. This can certainly be detrimental to the efforts of organizations, as it perpetuates the belief that the environmental community cannot come to an agreement and undermines their efforts to work with the seafood industry.

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[3] For a comprehensive list all items analyzed, the reader is encouraged to see Armsby and Roheim (2008).

One purpose of the cards is consumer education regarding the environmental issues surrounding the seafood they purchase. However, implementation of the advice may be a frustrating exercise for the consumer. As the examples above illustrate, unless consumers are extremely well informed and aided by: *i)* rigorously enforced country-of-origin labeling (which is only required in certain retail establishments and at most specifies farmed versus wild and country of origin) and *ii)* well-informed seafood counter personnel or wait staff, it is almost impossible for them to follow the advice of the guides. Generally, consumers are not well informed, nor are seafood counter personnel or wait staff well trained enough to be able to counsel on attributes of the product such as the gear type used to catch it, catch location, or even whether it was farmed versus wild. This is only exacerbated by intentional or unintentional mislabeling and fraud (U.S. GAO 2009). As a result, not only can consumers become confused (as highlighted by the recent poll by IntraFish [2009]), but also frustrated in their purchasing decisions and hence, frustrated with the seafood guides.

Thus, there may be merit to the consideration of simplifying the cards to remove too much differentiation with regard to catch area, gear type, and country of origin, leaving that differentiation to eco-labeling through the MSC or aquaculture certification programs as appropriate, such as the Global Aquaculture Alliance (GAA). Indeed, the extent of differentiation that is evolving in the rankings is beginning to mimic to some extent MSC certification, without the rigor of the assessment process, stakeholder involvement, and the ability for an objections process (Roheim 2008). Consumers who see the MSC-label on packages of seafood available at their markets and in restaurants do not need to inquire about catch area or gear types, but only need to look for the label. The benefits of the eco-labeling program are both a transparent approach to assessment, if properly applied, and an ease of use by consumers in that all they need to do is look for the label.

Provision of data-rich information is better provided in programs, such as that in place for Compass Group and other seafood buyers, who understand the nuances of the seafood market and are able to act on behalf of their customers. These buyers are also able to make educated decisions about whether or not to follow the advice of the guides, and may perhaps ignore the advice on some 'red' list items, such as farmed salmon and shrimp, or Atlantic cod, in favor of purchasing from select producers whom they believe are producing in a sustainable manner.

Implications for the Seafood Industry

Seafood buyers range in size from buyers for a single restaurant or market to the very large, such as Compass Group. Many of these seafood buyers wish to purchase sustainable seafood, yet do not know whose definition of 'sustainable' to follow because they believe that different environmental groups have different definitions. To buyers, it may be preferable to purchase seafood defined as 'sustainable' by the majority of the environmental groups. This allows seafood buyers to claim that a business' buying practices satisfy the generally accepted sustainability criteria. The analysis from this study gives some indication of which seafood items fall into that category.

However, it is also clear from this analysis that each group considers a wide variety of factors in their determinations of rankings. Thus, it is likely too simplistic for a business to base their purchasing decisions upon a wallet card meant for consumers' purchase decisions. Seafood buyers, in particular buyers for wholesalers and distributors, have access to far more information about the seafood they buy. That said, seafood buyers then have an obligation to maintain traceability and ensure that their customers have access to the same information, such that ultimately the final consumer may verify the information if there is to be a benefit from these guides.

It is equally clear that retailers and the restaurant industry must do a better job of training their staff to provide this information to consumers who have questions regarding

the sources of the seafood they may wish to purchase. More often than not, staff cannot answer questions; or worse yet, staff provide inaccurate or false answers. Reduction of fraud, whether intentional or inadvertent, is another necessity.

Conclusions

This study has compared sustainable seafood guides of several environmental groups to determine if there is a consensus among the rankings. While there is some level of consensus, the analysis found other unexpected and interesting results. In particular, differentiation of items according to catch area, gear type, and country of origin increases the probability of a frustrating shopping experience for the consumer who does not have access to such information.

This analysis is based on a particular edition of each of the environmental organizations' guides (see table 1); each of those guides changes over time. However, unless the guides discontinue their practice of differentiation of seafood items or choose to harmonize across all guides in future editions, the results and implications of this analysis will continue to hold.

The guides have imposed a variety of costs on society, while evidence of environmental and consumer benefits (not easy to measure) have not been as readily apparent to date. Entire fishing industries, aquaculture industries, and even nations have had their products put on the 'red' list, and have thus had to expend resources to combat negative publicity. Unmeasured, lost sales revenues have undoubtedly resulted. As a market-based incentive, this, of course, is the goal of the environmental community—to alter the production processes of those on the red list and reward producers when their practices become suitable for the green or yellow lists. However, for those segments of the red-listed items that have already invested in better production practices and yet bear the cost of both the investment and lost sales from being on the red list, the guides are draconian. To that end, those in the environmental community who continue to work toward other approaches than the guides, such as ecolabeling or purchasing practices that reward sustainable production practices regardless onto which list one falls, may well find that positive economic incentives reap more rewards than confusing consumers.

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