Social, Economic and Cultural Overview and Assessment for Ocean Management

Review and Analysis of Global Practices

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Executive Summary

The approach taken by the Department of Fisheries and Oceans towards an integrated approach to oceans management, and the development of Integrated Management Plans for Large Ocean Management Areas (LOMAs), requires attention to both ecosystem aspects and social, economic and cultural considerations. In this context, "the goal of integration is to move beyond treating social, cultural and economic issues and concerns as additional or peripheral considerations toward a more proactive process that includes these objectives as drivers and integral parts". This report on Social, Economic and Cultural Overviews and Assessments (SECOA) for Ocean Management is one step in a project, led by the Department of Fisheries and Oceans, to address these objectives.

This report reviews international examples of frameworks and methodologies that have been, or are currently being, used to collect and assess socio-cultural and economic information relevant to marine management. In this report, an analysis is carried out of 16 case studies representing examples of (1) several analytical frameworks, as well as several one-time studies, (2) varying geographic scales, but with a focus on regional and/or ecosystem-based planning activities, and (2) a range of countries and contexts, but emphasizing examples that can most easily be transferred to a Canadian context.

Case studies were identified and selected using a combination of approaches that included (1) expert opinion, based on correspondence with national and international experts in this area of interest; (2) literature reviews and (3) assessments based on a set of characteristics of a Large Ocean Management Area (LOMA) as defined by Fisheries and Oceans Canada. The first tier of case studies (the most relevant LOMA-scale) includes the South East Marine Region, the Russian Arctic, the Great Barrier Reef, the Scottish Coast, the Northwest Forest Plan, the Cod Grounds, Port Stephens and the Channel Islands. The second tier includes two groupings: large-scale multi-country case studies (Baltic Sea, Benguela Current LME and Greater North Sea) and small-scale case studies (San Salvador, Tortugas, Montego Bay, US Virgin Islands, Vaavu Atoll). These second tier case studies represent a "step up" and a "step down" in spatial area, when compared

with a LOMA; however they were selected because they illustrated specific approaches or lessons learned that could be useful to a SECOA.

This report outlines the methodology used in the review and provides a summary and analysis of the main findings, as well as general observations and evaluations of the case studies. A companion document provides an in-depth review of each of the report's 16 case studies, with each case study portfolio presented using a uniform format.

Overall, the case studies may also be seen as falling into two main groups in terms of the approach taken. Some were nested within a larger analytical framework and/or planning process; in these cases, our analysis involved reviewing the framework first, to contextualize and describe how the case study fits into the "bigger picture", before examining the case study itself. For another set of case studies, socio-economic assessments were carried out, not necessarily as a component of a national integrated planning process, and based on their own unique framework or methodology. In all cases, the objectives, project duration, funding source (where applicable), data description and methodology used for data collection and analysis are examined.

Among the limitations faced by the review team was the diversity within and across the case studies (in terms of planning phase, location, objectives, etc.) which made comparisons, "measuring success" and identifying "best practices" difficult. The time factor also constrained a more in-depth analysis and inclusion of other case studies. Given that there were very few examples that the team could draw on as "a good example of a SECOA at a LOMA scale", the team spent some time defining the parameters and constraints of this review, in consultation with Fisheries & Oceans staff and a consultant, and drawing on information provided by a set of experts.

As a final point concerning the approach used in this report, we note that the analysis of the case studies (as described in the companion document) include discussions of potential strengths and limitations of each case study, which include assessments both by those involved in the case studies themselves, and as interpreted by the present authors

within the context of what might be applicable to a Canadian situation. Unless stated otherwise, the latter points as well as the overall observations given at the end of this report, are the views of the present authors.

Based on the case studies reviewed, the following trends are identified:

Data sources and methodologies: 84% of the case studies used only secondary data, with the main source being statistical agencies, government departments and previous studies. Questionnaire surveys, interviews with key experts, focus groups and meetings were the main mode for the collection of primary data. Economic evaluation models, combined with mapping and GIS analysis, were the main forms of data analysis used in the selected case studies.

Identification of commonly used variables: At the LOMA scale, all eight case studies included an overview of the broad economic situation, including information on employment, income and industry profiles. Cultural considerations appeared to be divided into information on indigenous populations and national historical sites. Social information included demography, education and training, health and resource use conflicts. Governance factors related to applicable legislation and institutions. At the multi-country scale, there were similar economic and social factors as in the LOMA-scale case studies, except that cultural considerations were rarely assessed, which may have been a reflection of the large areas covered in these specific case studies. Governance factors were mainly limited to international conventions, rather then national policies and legislations. Small-scale case studies had similar social and economic factors to the other case studies, but governance factors also included community management, participation and issues relating to access rights. Although culture was not a notable explicit feature at this small-scale level, that may have been because cultural aspects in these localized areas were already embedded in the assessments. Two general overall trends noted were: (1) social data in the form of demographic data was included in all the case studies and (2) the depth of information collected is generally inversely proportional to scale.

Core Elements of a SECOA: Based on the information gleaned from the case studies, a set of "core elements" were identified, reflecting the minimum level of information that seems to be required for conducting a SECOA. Under the social component, the core variables include demography, education and training, health and community services and coastal-ocean use patterns. Economic variables identified included employment, macro indicators such as GDP, available utilities, industry profiles (notably the fishing sector) and housing. Cultural variables included indigenous traditions and heritage. The principal governance variables included structure, traditional/Aboriginal governance and enforcement/security. Although these lists reflect the more commonly occurring of the variables, the sum of these should not be interpreted as indicating a "best way" to conduct a SECOA. In reality, the approaches used and the depth of data collection will depend on local conditions, human and financial capacity, time and political constraints, as well as the objectives of the assessment. A SECOA must be adapted and its process modified to reflect all of these *relevancy factors*, including both spatial and temporal considerations.

Attribute Analysis: The attributes of a SECOA were divided into process-related, content-related and data-form components. It was apparent that each socio-economic assessment possesses different characteristics depending on its objectives, phase, time, budgetary and operational limitations – as above, these *relevancy factors* are crucial to consider in terms of how applicable a given case study is to a LOMA context. In terms of specifics, economic data was usually more in-depth than social, cultural or governance information. Interestingly, approximately half of the case studies flagged current and/or emerging threats that could affect the management area; this aspect could be of particular importance to LOMAs, e.g., in the face of climate change and privatization of rural areas.

Overall observations: The main trends that appeared to emerge for *process-related* points were: (a) cross-scale vertical and horizontal linkages are important when undertaking a SECOA at the scale of a LOMA, (b) the agendas of the agencies leading a SECOA may influence the short-term and long-term success of the work, and future implementation aspects, and (c) community involvement, especially in decision making, can help with the success of a SECOA, and furthermore, the team leading the SECOA

also needs to establish a process where feedback to the community and stakeholders that have contributed to the process can be undertaken, if trust is to be built between the different partners and stakeholders.

The main points in terms of *content-related* factors were: (a) governance factors underpin many of the social-economic and cultural aspects that are contained in a SECOA, so these variables also need to be included when doing the assessment; (b) given the large spatial scale of a SECOA, having a number of representative characteristic sites could provide a way to balance assessment costs and address data deficiency issues, and (c) building on work that has already been undertaken by communities or other partners could be a less conflict-prone way towards meeting common objectives, while reducing expenses and building trust. However if this strategy is to be successful, the approach used to engage partners, share ownership of the project and integrate the different interests and components, should be done respectfully and not be rushed.

Data form trends that emerged included: (a) the diversity and complexity of LOMAs, including the jurisdictional complexity, imply that a "one size fits all" approach is not appropriate; while the creation of national standards would be useful, to ensure that broad categories of information (and key variables) are included and suitable methodologies are followed, it would not be helpful to specify at a national level too much detail in terms of the particular information (e.g., sub-variables) that must be collected in all LOMAs; (b) GIS mapping and maps are useful tools to analyze the information collected, both for government use as well as to produce and present back to the community meaningful results in a user-friendly forum, and (c) in the early phases of planning, long-term monitoring and evaluation processes need to be developed and budgeted, to support a SECOA program.

Finally, it is highly recommended that the SECOA team receive guidance and training in conducting a SECOA, in both the field (community and stakeholder approach, sensitivity and practicality) and analysis components (data storage, analysis, presentation) prior to the commencement of the assessment.

In conclusion, this report has sought to determine, based on reviewing a set of case studies, some of the key ingredients and minimum essentials that might be needed to conduct and support a SECOA. However, two points should be highlighted. First, locating or obtaining the information required to conduct a SECOA, at the scale of a LOMA, is bound to be challenging in practice. Second, undertaking a SECOA at the scale of a LOMA is rare globally, and could be considered "cutting edge" work. In this context, Canada may have the opportunity to be a leader in this area, at the same time taking on the responsibility of sharing the information and lessons learned both at home and with other countries and regions.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Glossary

Commonalities: Variables and sub-variables appearing in two or more case studies.

Framework: An umbrella term encompassing integrated planning processes and broad methodologies for conducting socio-economic assessments (or, more broadly, SECOA analyses).

One-off Case Studies: For the purposes of this report, one-off case studies are defined as overviews and/or assessments that have been conducted on an *ad hoc* basis, that do not follow a particular generic framework or methodology.

Participatory: Stakeholders, including outside researchers, community groups, resource users and other interest groups, are involved, and all learn from the process.

Process-Oriented: The focus is on the *process* of collecting information, so that the learning mechanisms may be as important as the information obtained.

Product-Oriented: The focus is on producing an information report for an agency or for one or more groups of stakeholders.

Socio-economic Assessment: A study of the social and economic, (and possibly also the cultural and policy) conditions of individuals, groups, communities and organizations. Assessments are generally conducted at the start of a project to help better understand the situation and to establish baseline conditions.

Socio-economic Monitoring: A regular process over time, usually at a set of intervals, and following an initial assessment, in order to measure changes and observe whether the project is meeting its objectives. Assessment results will help define the monitoring parameters, but because monitoring is repeated regularly, fewer parameters will be measured than the initial assessment, and these may change as the project continues.

Relevancy factors: The temporal, spatial and operational factors that may influence the success of the project or program; key relevancy factors include the objectives of the assessment, the phase of the assessment, human and financial capacity, political and operational realities, and time and budget for the assessment.

1.0 Introduction

The move of Fisheries and Oceans toward an integrated approach to oceans management, and the development of Integrated Management Plans for Large Ocean Management Areas (LOMAs), requires attention to both ecosystem aspects and social, cultural and economic considerations. DFO outlines the context for this report as follows:

> *"The past two years have seen the development of Ecosystem Overview and Assessment Reports, and ecosystem and conservation objectives. In order to successfully develop relevant objectives, however, it is also necessary to conduct social, cultural and economic overviews and assessments in the LOMAs. It must be noted that the goal of integration is to move beyond treating social, cultural and economic issues and concerns as additional or peripheral considerations toward a more proactive process that includes these objectives as drivers and integral parts. Social, cultural, economic and ecosystem objectives should be considered comprehensively as interconnected parts of a complete Integrated Ocean Management Plan."*

The aim of this report is to conduct an international review of existing case studies, frameworks and methodologies of social, cultural and economic data gathering, overviews, and assessments relevant to marine management. In doing so, this report (1) covers various geographic scales but maintains a particular focus on regional and/or ecosystem based planning activities (2) includes examples from a range of countries and contexts, but concentrates on examples that can most easily be transferred to a Canadian context and (3) includes some generic works in order to help frame the discussion, but attempts to keep the approach as practical as possible, focusing on insights into real examples.

The studies examined herein come from a range of situations and with a range of terminology. For example, a common term is that of a "socioeconomic assessment". According to the Socio-Economic Manual for Coral Reef Management (Bunce, et al., 2000), such an assessment is a way to learn about the social, cultural, economic, and political conditions of individuals, groups, communities, and organizations. Bunce et al. (2000) note that there is no fixed list of topics examined in a socioeconomic assessment, but the most commonly identified topics include: gender, resource use patterns, stakeholder characteristics and perceptions, market attributes for extractive and non-extractive uses, market and non-market use values.

As the conditions within each LOMA are vastly different relative to one another, the compilation of case studies herein is intended to be as diverse as possible so as to provide a "toolbox" of different perspectives and various options from which to pick and choose. It must be highlighted, however, that the relevance of each case study is dependent on various operational factors such as time, budget and capacity as well as contextual factors such as the enabling environment in which the assessment was conducted.

It is also worth noting that examples of social, economic and cultural assessments in large-scale marine management initiatives have been quite difficult to come by and it seems apparent that a study of this scale has not been undertaken before. While the concept of assessing social, cultural and economic dimensions is anything but new - there are plenty of studies telling us that they need managing and that the need is urgent – there are few legislative and administrative mechanisms that provide for demonstrably sustainable use and conservation of biodiversity in the same package and as co-equal objectives (Kenchington, *pers. comm*.).

1.1 Report Format and Presentation

This report presents the methodology, summary and analysis of the main findings and general conclusions from the study. A companion document (available on request) presents the portfolios and corresponding evaluation for each case study analysed.

2.0 Methodology used in this review

2.1 Data Collection

2.1.1 Expert Consultations

The first step of data collection involved the compilation of a list of expert contacts, people with rank, experience and knowledge who can provide extensive insight on socioeconomic issues and initiatives throughout the world. Over email, the contact persons were asked for their thoughts on examples of processes, assessment frameworks or case studies of spatial management that consider the human dimension in their planning and execution. It was emphasized that terrestrial examples as well as work of any scale (i.e. ranging from a

Large Marine Ecosystem to a typical MPA) would be of interest. This list is presented as Appendix A.

2.1.2 Literature Search

An Internet-focused literature search was undertaken in September 2007, drawing to a considerable extent on sources and feedback from the above-noted experts. Websites reviewed include but are not limited to:

- Government agencies and institutions (e.g. National Oceanic and Atmospheric Association; Canadian Department of Fisheries and Oceans)
- Non-governmental organizations (e.g. The Nature Conservancy; The World Wildlife Fund; Conservation International)
- International institutions (e.g. United Nations Environment Program; the Food and Agriculture Organization)
- Universities (e.g. University of Rhode Island; University of British Columbia)
- Major donors (e.g. the Global Environment Facility; the World Bank)

In conjunction with the electronic search, relevant hard copy materials (e.g. handbooks) either provided by the experts or found in libraries were also examined and reviewed.

2.2 Analytical Frameworks & Case Study Selection

In order to assess the suitability of case studies, an intensive process was undertaken. To ensure the information presented was relevant to a LOMA context, potential case studies were evaluated against seven LOMA characteristics (extracted from DFO background material - see Appendix B); based on this, eight case studies were selected as of highest relevance. While these case studies could be further sub-divided according to spatial scale, this was not done here, to keep the sample size higher during the analysis phase.

The remaining case studies, considered second-tier in terms of relevancy, were grouped according to spatial scale, with one group representing assessments involving multiple countries and the other focusing on reports based on local sites. These case studies can be considered a scale up and a scale down from LOMAs respectively. While they may not be as directly relevant to a LOMA context as the first-tier case studies, they still offer

important lessons that should not be overlooked. The groupings of case studies are depicted in Figure 1a and their geographical location is presented in Figure 1b. It should also be noted that where expert contacts referred us to particular case studies, every effort was made to include their recommendations (refer to Appendix B)

Some of the case studies appeared to be baseline assessments with the objective being to provide a general background and context for further developing a management plan (e.g., the Scottish Coast). Other case studies seem to be further along the planning timeline, leading towards the establishment of a management plan (e.g. the Cod Grounds and Channel Islands assessments) or the multi-scale large area management programs set within a boarder national bioregional planning framework (South-East Marine Region). The North West Forest and the Great Barrier Reef case studies are interesting examples of the process required for conducting evaluations and revising established management plans using social-economic indicators and approaches. The former study evaluates the success of a 10-year forest management plan whereas the latter example emphasizes the process undertaken for the revision of “use zones” within the marine park.

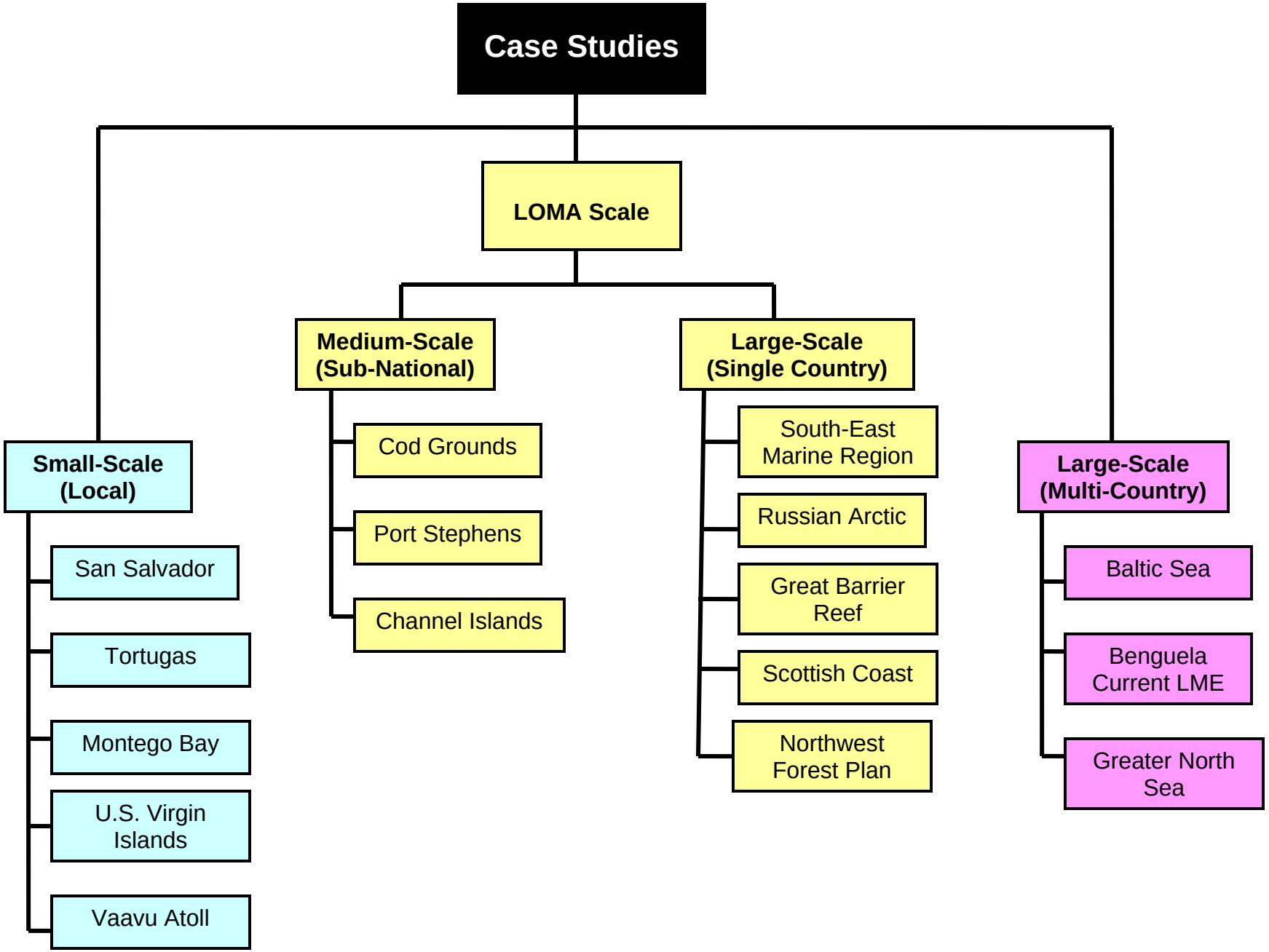

Figure 1a: Grouping of case studies according to relevance to a LOMA

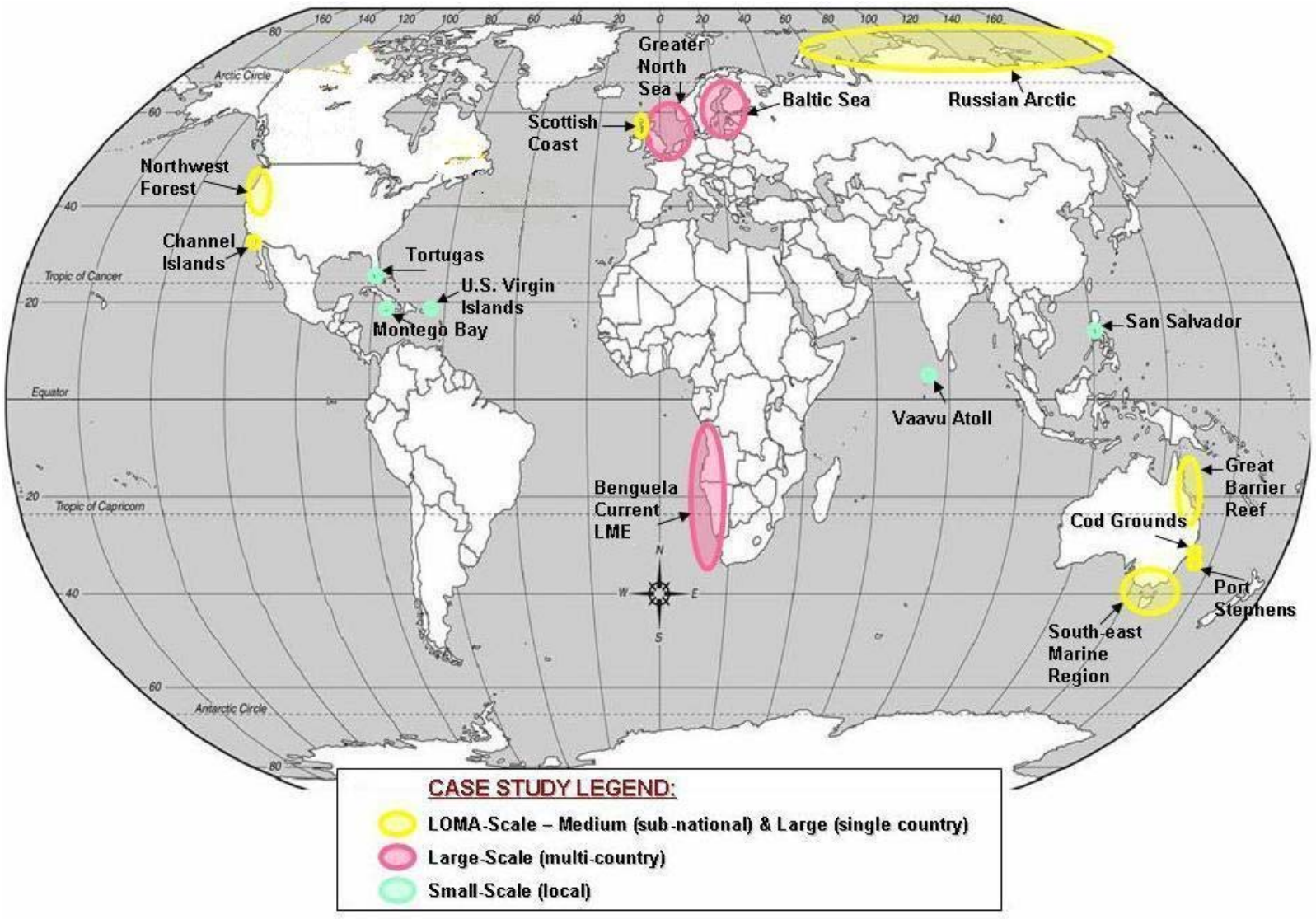

Figure 1b: Geographical location of the 16 case studies (source: http://chuma.cas.usf.edu/~juster/volc1/world%20map.gif)

2.3 Case Study Format

Each of the 16 selected case studies follows a uniform format, consisting of two sections.

1. Framework Overview

Certain case studies are nested within a larger planning process and this report attempts to contextualize and describe how these case studies fit into the "bigger picture". In this report, two integrated planning initiatives are reviewed:

- Australia's Bioregional Planning;
- Scotland's Integrated Coastal Zone Management Planning

Some socio-economic assessments are not necessarily a component of a national integrated planning process, but are conducted by NGOs or industry as part of a large-scale project. These assessments often follow established frameworks and/or methodologies. This section also attempts to explain the "raison d'etre" and clearly outline the assessment procedures of the following frameworks:

- Socio-economic Impact Analysis (SEIA)
- Global International Waters Assessment (GIWA)
- Socioeconomic Manual for Coral Reef Management (SocMon)
- OSPAR Quality Status Reports
- Large Marine Ecosystems (LME) 5 Module Approach
- U.S. Northwest Forest Plan

2. Practical Overview

This section provides in-depth examinations of real examples, i.e. already completed socio-economic overviews and/or assessments, and involves a particular focus on process in order to tease out the specific data types, sources and gathering methods used. The "areas for future consideration" component involves an evaluation of the study's strengths and limitations as related to a SECOA context, based primarily on our general impressions; however, where available, those listed in the report itself were also included. The case studies are drawn from examples of the integrated planning initiatives and frameworks listed above, as well as relevant one-off studies.

2.4 Challenges and assumptions for this review

The large scope of this undertaking, in terms of the wide breadth of variables that can be considered, combined with the diversity of case studies examined, created both an opportunity and a challenge for the project team in narrowing down a portfolio of potentially-useful components and considerations. In addition, trying to define "best practices" was difficult because of the variability and diversity of the case studies. For example the complexities involved in assessing successful or best practices in these case studies are demonstrated by the Port Stephens case study. Although primary data was noted as not being used in the particular report examined (thus being a limitation, because the process did not appear to have engaged the stakeholders), upon closer examination it became clear that the document in question was actually the third report in a series that drew on the baseline primary data that had been collected in an earlier report. However, this case study did note the difficulties in using the earlier report because it was a) done in adjacent areas similar but not identical to the Port Stephens area of interest, and b) done after a marine park and its boundaries had been established which differed from the Port Stephens case where boundaries had not yet been established.

Other noted challenges and assumptions that were made while doing this review included:

(1) Social-economic assessments, although framed in this manner, tended to be more economic in nature. Cultural components were seldom included explicitly; this may have been a reflection of either a) other reports having been done separately but contributing to this planning phase or b) the embedding of cultural considerations implicitly within the assessment, in situations where local indigenous people are the majority community.

(2) Within the 16 case studies, there was a vast array of project objectives, tailored specifically to the local conditions in which the assessment was conducted. In other words, "success" was difficult to define and gauge as it could be viewed either in terms of the assessment meeting its own objectives or in terms of the assessment including similar information to a SECOA, thereby making it more relevant and/or useful to the present study.

(3) Being a review of global practices, the case studies represent a wide geographic distribution; and there are significant differences in the enabling environments of each

setting which could act to either support or limit the particular study. Furthermore each case study employed different methodologies and, for the most part, collected different information variables. Consequently this made comparison of assessments across case studies both qualitative and subjective.

(4) Not all of the socioeconomic assessments used in the case studies were in the same phase of implementation. For example, some were baseline studies which acted as an initial scoping exercise; others seemed to be a phase ahead and included assessments and detailed analysis of the data collected (these tended to be part of a larger study that involved a series of reports and/or was set within a wider planning framework); a few studies (e.g. Great Barrier Reef and Northwest Forest Plan) were in a monitoring and evaluation phase and, consequently, were collecting different information. Both the type of information and what the information is used for differ from phase to phase, which again made comparison across all case studies subjective.

(5) The limited time available for this study constrained the range of cases that could be examined and the level of analysis that could be performed.

3.0 Results and Analysis

To assess and compare the case studies, all the data used (including the variables and sub-variables) were compiled into a master database, using Microsoft Excel (refer to Appendix C). The data for each group (i.e. small-scale, LOMA-scale and large-scale) was then filtered, extracted and aggregated into tables of common categories to facilitate comparison. Based on these tables the data were mined and subsequently analyzed.

3.1 Data Sources and Methodologies

Data collected is either as primary, secondary or a combination of both. Secondary data includes information from literature reviews of relevant published and grey material as well as other sources such as websites and databases. Primary data includes information collected from the field through approaches such as face-to-face interviews, telephone and postal surveys, expert and public focus groups and traditional oral documentation; for example, the South-East Marine Region used community workshops and focus groups to obtain primary data.

Figure 2 outlines the distribution of primary and secondary data used across the different case studies. The South-East Marine Region, Montego Bay, Tortugas Ecological Reserve and Vaavu Atoll were case studies that utilized a healthy combination of both primary and secondary data. Although all of the case studies used secondary data, some studies built on earlier primary data that had been collected from either the specific management area in question or similar/adjacent areas. This is particularly the case where the assessment was part of a larger series of studies (e.g. Port Stephens Marine Park). From the case studies reviewed, it was abundantly clear that secondary sources were more widely used for socio-economic assessments than primary sources (84% versus 16% respectively) as depicted in Figure 3 below.

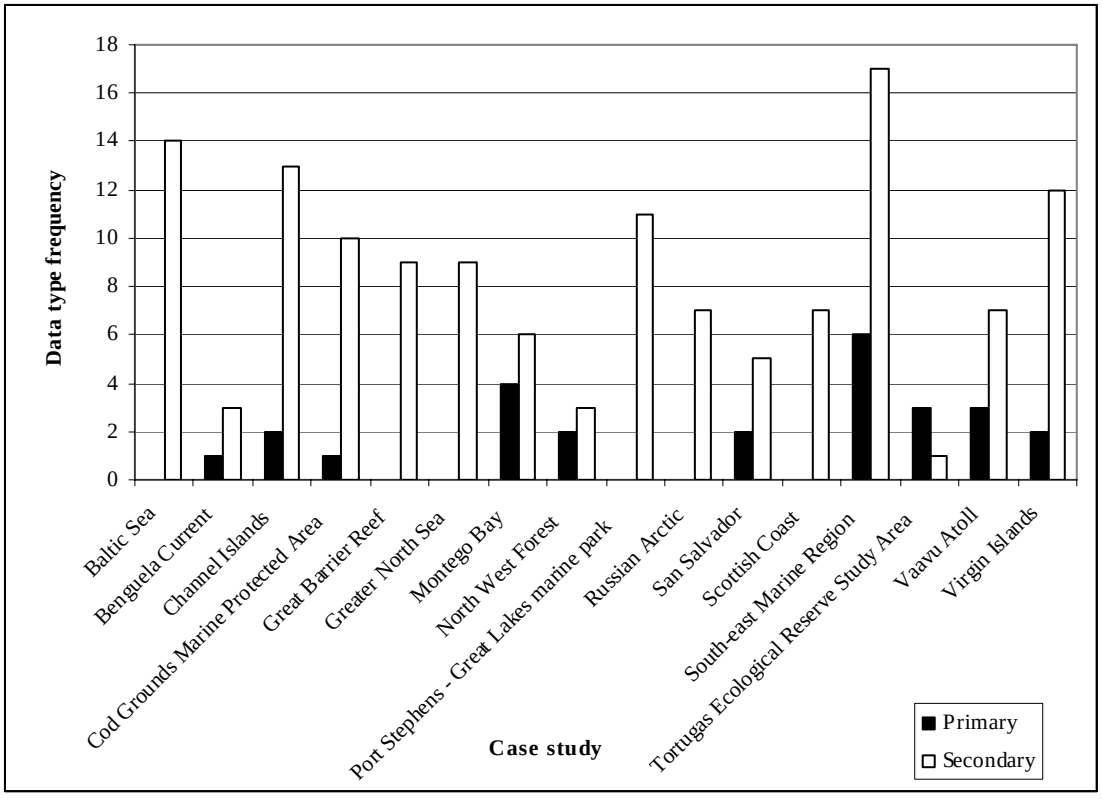

Figure 2: The distribution of primary and/or secondary data within the 16 case studies.

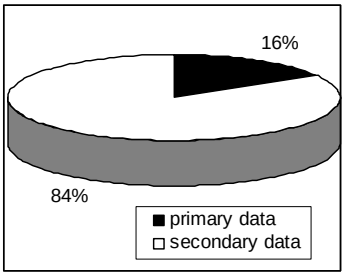

Figure 3: Percentage of primary and secondary data used in the 16 case studies.

3.1.2 Data Sources

From this fairly small sample size of case studies, it seems that socio-economic data is most commonly obtained from statistical agencies (i.e. U.S. Census Bureau etc.), with 13 of the 16 case studies using some form of census information (Figure 4). Census data potentially offers the greatest depth in time and consistency in methodology, and many other research reports and international agencies rely on these government sources for their data. The next most frequented sources included government departments (other than government statistical agencies) as well as previous research studies and review reports (11 of the 16 case studies). These assessments range from government commissioned studies for particular decision making processes to studies by industry, consultants, NGOs and academic researchers.

Although these data sources often provide greater detail regarding specific issues, human populations, or localities, they are often one-off studies with less than consistent methodologies (e.g. Montego Bay). Furthermore, as they are rarely repeated, they lack the consistency that can be provided by census data and similar information from statistical agencies for temporal comparisons. The down-side to census data is that it is seldom collected annually, hence the information may restrict short-term timeframe comparisons; however, this approach does provide a relatively cost effective way to obtain information for profiling social-economic components for the area or community of interest.

Another type of secondary data source is studies that bring together socioeconomic data from a variety of sources to produce a more multidimensional report on current socioeconomic conditions in a specified locality (e.g. Northern Sea and the Benguela Current case studies). Peer reviewed journal articles, industry reports, specialist working groups, research

institutions, and inter-governmental agencies such as the Food and Agriculture Organization (FAO) are examples of such sources that are used to compile these regional assessments. Other examples of secondary data sources include web-sites and maintained data bases, GIS information such as maps and satellite images and grey literature from NGOs and other civil society organizations.

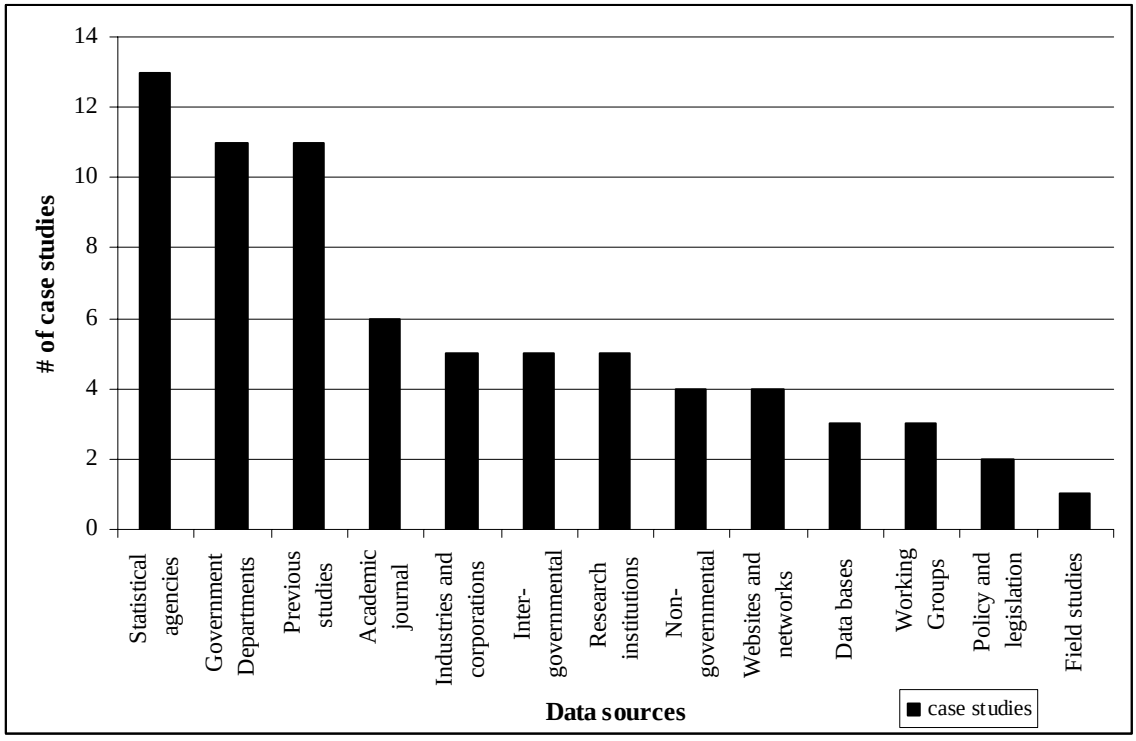

Figure 4: Secondary data sources used in the 16 case studies

3.1.3 Data Collection

The main form of collecting primary data in these case studies was through questionnaire surveys, interviews with key experts, focus groups, meetings and workshops. A summary of the approaches used is provided in Table 1. The recent IOC Manuals and Guides (2006) and monitoring guides by Pomeroy et al. (2004), Wahle et al. (2003) and Bunce et al. (2000) provide good examples of indicators and methodologies for collecting and analyzing social, economic, governance and cultural components in the context of both primary and secondary data.

3.1.4 Data Analysis

Within the case studies, several different analytical methods were utilized to evaluate the data, including but not limited to:

- Economic evaluation models that incorporate both boundary analysis and risk models to determine the impacts to communities and industries by the different alternatives and scenarios being proposed.
- Total economic valuation models and assessments (specific to Australia)
- Mapping and GIS analysis supporting the above analysis.
- Operational costs and the complexity of navigating jurisdictional frameworks. For example, Channel Island and Tortugas Ecological Reserve case studies noted the implications of complex jurisdictional frameworks associated with conducting a boundary analysis of the proposed marine park boundaries.
- The Port Stephens and Great Barrier Reef case studies discussed the costs to government for establishing the marine park and the implications of purchasing commercial fishing business buy-backs.

3.1.5 Observations on data sources and methodologies

Based on the case studies reviewed, the following points arose:

- Baseline studies used mainly secondary data to first scope out the context of the study (Great North Sea, Baltic Sea and Scottish Coast). Potential benefits of this approach are the reduced expenses and, in some cases, shorter research timeframes.
- Most assessment and evaluation studies used both primary and secondary data (e.g., South-East Marine Region, Cod Grounds and North West Forest). These studies also tended to be more complex and required longer timeframes, and perhaps involved additional human and financial resources.
- Multi-country and regional planning assessments were reliant on aggregated data from national sources, which required the collaboration and cooperation of the participating in-country offices. Potential issues associated with this approach include language and translation challenges, differences in methodologies, confidentiality and official clearance, incorporating “grey literature” (sourcing and incorporating un-published reports and papers) and intellectual property rights (indigenous communities). This

may be a common issue for large-scale multi-country regional planning and, in the context of a LOMA, these factors may also need to be considered.

- Implications of the different stages or objectives of specific case studies will also need to be considered within the availability of human and financial capacity and project timelines. For example the San Salvador and US Virgin Islands case studies, although not specifically at a LOMA scale, suggest approaches for rapidly assessing social-economic factors in coastal and marine-resource-dependent indigenous communities.
- As with all quantitative and qualitative socioeconomic data, the relevance, limitations and possible biases of the data and the objective of the study should be carefully considered. For example, economic measures such as GDP are known to omit important economic activities such as the underground economy and small-scale subsistence practices which are important elements in considering community well-being.
- Similarly, changes in crime statistics have been critiqued as being more a reflection of changes in statistical practices, police enforcement measures and the willingness of victims to report crimes than objective measurements of the number of crimes being committed.
- The limitations of socioeconomic data suggest that management decisions should not be made based solely on currently available data. Current data will provide an excellent background for meaningful consultation with communities living within LOMAs but potentially may only in general terms capture the effects of some management decisions.
- Although funding agencies were noted in the case studies, few if any reports documented the costs for undertaking these studies and the number, roles and expertise of the people involved. This could have been helpful for considering future planning, capacity and operational costs for LOMAs.

Table 1: Summary of primary data collection methods used in the case studies

Country	Case study	Description
Australia	Cod Grounds Marine Protected Area	Interviews (25) – with owner operators of fishing businesses, employees of fishing businesses who work on the boat, partners in fishing business who don't work on the boat, family members of owner operators or employees, fish cooperative managers, fish cooperative retail outlet lessee.
	South-East Marine Region	Community Assessment: Interviews with 250 marine-related, community-interest groups (non-commercial) and 1300 individuals from a stratified random sample of coastal community.
		Community Assessment: 30 key regional and national conservation organizations and government representatives were interviewed
		Community Assessment: Commonwealth and State managers were interviewed
		Indigenous Assessment: Indigenous Working Group were interviewed
		Indigenous Assessment: Personal communication
Jamaica	Montego Bay	Interviews (52) - with persons familiar with, and knowledgeable about, one of the three user groups
Maldives	Vaavu Atoll	Interviews with reef stakeholders
		Interviews with civil servants
Philippines	San Salvador	Surveys: random sample of 42 fishing households
		Interviews with village leaders, members of fishers associations and others who have worked at the site
South - Western Africa	Benguela Current	Interviews (6) - with officials familiar with marine industrial activities and issues in the Benguela Current region
United States	Channel Islands	Individual interviews using questionnaires
		Focus group (Fishermen Associations)
	Tortugas Ecological Reserve Study Area	Sea Web 1996. National Sample of 900 U.S. Households 10-15 May, 1996
		Environmental Opinion Study, Inc. National sample of 804 households conducted 18-26 May 1991.
		Telephone interviews
		Focus groups (2) – representatives of fishers (30) and water sports operators (5)
		Telephone surveys (8) – conducted of hoteliers for hotels that border the Park and/or who have expressed a particular interest in Park management
		Personal and staff observations and field notes
	North West Forest	Interviews with 223 members of 12 communities associated with the sample forests, and 82 agency employees working on the four forests were the source of these qualitative data.
		Interviews were the main source of data for evaluating progress in agency-citizen collaboration under the Plan, and evaluating how effective the Plan has been in protecting forest values and environmental qualities associated with older forest and aquatic ecosystems.
	Virgin Islands	Stakeholder surveys
		Personal communication with key informants

3.2 Identification of Commonly Used Variables

3.2.1 Methodology

Using the database of raw information from the case studies (refer to Appendix C), the first level of analysis involved data mining to identify *commonalities* in data used within each grouping of studies, based on frequency. This information was placed into tables, one for each case study grouping (small-scale, LOMA-scale and large-scale respectively). These tables (Tables 2-4 below) thus show those data variables and sub-variables that are most commonly used in the case studies, for each particular case study grouping. It must be noted that where cells in the sub-variable category appear empty, this does not imply that no information was collected; rather, it reflects a lack of commonalities across case studies, simply suggesting that different sub-variable information was chosen in the various cases to represent that particular variable.

3.2.2 Preliminary Analysis: Commonly Used Variables

LOMA-Scale

- Both the Port Stephens and Great Barrier Reef assessments included an economic valuation of Ecosystem Services, but also coupled this with an attempt to measure ecosystem values (i.e. how important the ecosystem services are to people). This approach is particularly useful in terms of justifying and setting priorities for decision-making and policy development.
- All 8 of the case studies included an overview of the broad economic situation (including information on employment, income, utilities etc.). This acts to establish a basic understanding of the enabling economic environment, which is often a major root cause of social problems and cultural degradation.
- The majority of the assessments involved individual profiles of all the major industries operating in the area such as oil & gas, tourism, marine transportation (e.g. Russian Arctic, Channel Islands, Great Barrier Reef, Scottish Coast and South-East Marine Region). However, more sector-based approaches (i.e. focused on a single major industry) were also used; in the case of the Cod Grounds and Port Stephens, the fishing industry (both commercial and recreational) was the primary focus, while forestry was the major industry considered in the Northwest Forest Plan.

- While the level of detail and types of data collected differs markedly in the various industrial profiles, there were several common sub-variables that seemed to surface including (1) the value of the industry to the economy; (2) the number of people employed in each industry and (3) the industry's annual total production.
- Cultural considerations appear in several case studies (e.g. South-East Marine Region, Great Barrier Reef, Russian Arctic and Northwest Forest Plan) but to varying extents. For example, in the South-East Marine Region, an extremely in-depth indigenous assessment was carried out, evaluating traditional relationships and rights, aspirations, impacts of colonisation etc.. On the other hand, in the Russian Arctic, cultural considerations included some demographic statistics for indigenous peoples accompanied by a basic overview of traditional activities.
- Aside from information on indigenous populations, the next most common form of cultural data relates to national historic sites such as shipwrecks and archaeological remains, national parks and protected areas and so on (Scottish Coast, South-East Marine Region, Great Barrier Reef).
- Governance data appeared intermittently throughout the case studies and, where it did, it generally involved listing applicable legislation and relevant institutions (government agencies, NGOs, community and environmental organizations, etc.).

Multi-Country

- The assessments at this level tend to be quite broad and usually attempt to paint a general picture of each of the countries involved. As such, macro-indicators such as GDP are heavily relied upon. These may not accurately portray what is happening at lower scales.
- At this scale, cultural variables are rarely considered in assessments. Given the enormous areas in question, there may be too many distinct populations to consider properly. Also, the area of interest in these assessments is vast and predominantly open-ocean; cultural ties to the marine environment often are coastal in nature (due to accessibility issues), so it is possible that cultural influences are not exerted as strongly at this level.
- Governance aspects considered in the large scale assessments tend to take on the form of listing relevant international conventions rather than national policies/legislation.

Small-Scale

- The lack of cultural variables in the table of small-scale studies does not indicate that culture was not considered in these studies, but rather that there were no explicit variables in common between the studies. Because several of these assessments were conducted in remote, localized areas (e.g. San Salvador fishing village, Montego Bay, Vaavu Atoll, U.S. Virgin Islands) the entire essence of the assessment was rooted in the local culture. Since at this level, cultural considerations are innate and permeate into every aspect of the human dimension, it thereby makes it difficult to extract "variables" for assessment.

- Being a table of *common* variables, the depth of information collected at this local scale is not accurately reflected. For example, in San Salvador, fishers were surveyed to ascertain, amongst other things their attitudes towards the distribution/sharing of responsibility for fisheries management and their willingness to support a similar project in the future - because this information is so tailored to the local context, it tends not to show up in a meta-analysis such as this. However, the specific information that was collected is outlined in detail in the case study summary tables provided in the companion document.

General Trends

- Social data primarily takes the form of demographic data, which is consistently included in the case studies, no matter the scale of analysis.
- The depth of information collected is generally inversely proportional to scale: as the scale increases, the level of detail decreases.

Table 2: Identification of commonly used variables for LOMA-scale case studies

Data Type	Variable	Sub-Variable (if any)
Social	Demography	Population
		Population Change
		Migration Rate
		Age Structure
		Gender Structure
	Education & Training	Attainment
	Resource Use Conflicts	*(no commonalities)*
	Health & Community Services	Poverty/Quality of Life
Economic	Employment	Unemployment Rate
	Income	Average Annual Income
	Housing	(no commonalities)
	Utilities	Power Generation
	Macro-Indicators	GDP/GVP
		Economic Diversification
		Total Economic Value
	Industry Profiles (Land-Based Activities, Mining, Oil & Gas, Marine Transportation, Tourism, Research)	Value to Economy
		# People Employed
		Total Production
	Commercial Fisheries & Aquaculture	Volume & Value of Catch
		Major Species Landed
		Methods
		# people employed
Cultural	Cultural Heritage	National Parks, Historic Sites, Shipwrecks etc.
	Traditional Rights	*(no commonalities)*
	Traditional Practices	Hunting
Governance	Structure	Applicable Legislation
		Institutions
	Enforcement & Security	*(no commonalities)*

Table 3: Identification of commonly used variables for large-scale multiple country assessments

Data Type	Variable	Sub-Variable(if any)
Social	Demography	Population
		Urbanization Rate
		Population Density
	Education & Training	*(no commonalities)*
	Health & Community Services	Poverty/Quality of Life
Economic	Macro-Indicators	GDP per capita
	Employment	Unemployment Rate
	Industry Profiles	Production Rates
		Value to Economy
Cultural	-	-
Governance	Structure	Applicable Legislation Institutions
	Enforcement & Security	Military

Table 4: Identification of commonly used variables for small-scale assessments

Data Type	Variable	Sub-Variable (if any)
Social	Demography	Total Population
		Age Structure
		Gender Structure
	Education & Training	*(no commonalities)*
	Resource Use Conflicts	*(no commonalities)*
Economic	Macro-Indicators	*(no commonalities)*
	Income	*(no commonalities)*
	Industrial Profiles	Value to Economy
		Level of Dependence
		Types of Equipment
	Employment	# of people employed
	Housing	Household Size
Cultural	-	-
Governance	Structure	Institutions
	Management	Stakeholder Perceptions
	Participation and Access Rights	*(no commonalities)*

3.2.3 Core elements of a SECOA

Table 5 presents the "core elements" of a SECOA – data which the results of this report's analysis indicates are most important to accurately and thoroughly carry out an overview and assessment. This provides an overall sense of how others have focused in terms of the human dimensions of ocean management. Selection of these elements was based entirely on the case studies, which involved reviewing Table 2-4, re-assessing the raw data (see Appendix C) and a data mining exercise to draw out commonalities between all of the case studies, regardless of their grouping in earlier analyses. As such, this table represents those data variables and sub-variables used in all spatial scales of social, economic and cultural assessments. This aggregated analysis, while to some extent seeming to compare "apples and oranges", enables the integration of the smaller and larger scale studies, as well as LOMA-scale studies, to draw overall lessons. In terms of process, sources of data and collection methods drawn from the case studies are listed alongside the core elements, as potentially suitable options for future studies.

It should be noted that while this list indicates commonly-occurring variables used in overview and assessment studies, there is no "best" way to conduct a socioeconomic assessment. The order of the steps and data collected will vary widely depending on local conditions, capacity, budgetary and time constraints as well as the objectives of the assessment (Bunce et al. 2000). Moreover, socioeconomic assessment should be adapted, and its process modified, to the particular situation and context.

Table 5: Core elements of a social, economic & cultural overview and assessment

	Variable	Sub-Variable	Potential Source	Collection Method
SOCIAL	*Demography*	Total Population	- Statistical Agencies - Government Departments and reports - Statistical Agencies	- Review of Secondary Data
		Age Structure		
		Gender Structure		
		Migration		
		Population Change		
	Education & Training	Attainment		
	Health & Community Services	Poverty/Quality of Life	- Government Departments and Reports - Statistical Agencies - Stakeholders	- Review of Secondary Data - Surveys - Interviews
		Water & Waste Disposal	- Government Departments and Reports - Statistical Agencies - Research Institutions - Non-governmental agencies and civil societies	- Review of Secondary Data
		Number of Health Care Facilities		
		Number of Health Care Workers (doctors, nurses etc.)		
		Common Diseases		
	Coastal/Ocean Use	Use Patterns	- Stakeholders (i.e. resource users, key informants)	- Surveys - Interviews - Observation - Workshops
		Current & Potential Use/User Conflicts		
ECONOMIC	*Employment*	Unemployment Rate	- Government Departments and Reports - Statistical Agencies	- Review of Secondary Data
		# of People in Labour Force		
	Macro-Indicators	GDP		
	Utilities	Power Generation		
	Industry Profiles (Tourism, Oil & gas etc.)	Economic Value	- Government/Statistical Agencies - Industry Reports - Non-governmental Agencies and Civil Societies	
		Total Production		
		# People Employed by Sector		
	Fishing Sector	Volume and Value of Catch	- Government/Statistical Agencies - Fisheries Councils - Catch Records - Industry Reports - International Institutions (FAO)	
		Major Species Landed		
		Methods		
		# People Employed in Sector		
	Housing	Low Income Housing	- Government Departments and Reports - Statistical Agencies	

Table 5: Core elements of a social, economic & cultural overview and assessment (cont'd.)

	Variable	Sub-Variable	Potential Source	Collection Method
CULTURAL	*Indigenous Traditions*	Traditional Activities (e.g. hunting) Use of Aboriginal Language Use Patterns (seasonal & temporal)	- Historical records - Stakeholders (indigenous community members, elders & leaders) - Non-governmental Agencies and Civil Societies	- Review of Secondary Data - Surveys - Interviews - Observation
	Heritage	National Historic Sites, Shipwrecks, Parks etc.	- Government Agencies - Non-governmental Agencies and Civil Societies - Research Institutions	- Review of Secondary Data
GOVERNANCE	*Structure*	Applicable Legislation NGOs/Community Organisations Institutions	- Government Departments and Reports - Academic Journal Articles - Non-governmental Agencies and Civil Societies - Policy and Legislation Documents - Specialist Working Groups & Advisory Councils	- Review of Secondary Data
	Traditional/Aboriginal Governance	Traditional Relationships Ownership & Access Rights	- Historical records - Stakeholders (indigenous community members, elders & leaders) - Previous studies and reports - Academic journal articles - Non-governmental Agencies and Civil Societies - Policy and Legislation Documents	- Review of Secondary Data - Surveys - Interviews - Observation
	Enforcement & Security	Coast Guard/Naval Activity	- Government Departments and Reports	- Review of Secondary Data

3.3 Attribute Analysis

3.3.1 Methodology

Based on the "areas for future consideration" section within the assessment of each case study (in the companion document), a suite of characteristics or attributes of socio-economic assessments was formulated and these were then grouped as process-related, content-related and data-form related. Each case study was subsequently evaluated in terms of the presence or absence of each attribute; however, it is important to note that no judgment was made (i.e. the presence or absence of the attribute was not viewed as a strength or limitation, simply a characteristic).

3.3.2 Attribute patterns

Although there are potential general trends, this attribute analysis demonstrates the complexity of trying to assess different case studies firstly, in terms of their usefulness to the SECOA and, secondly, in the context of the limitations and gaps as defined in the actual reports. This is a key point: the absence of a certain attribute in a given case study (e.g. "lack of stakeholder participation") may appear to be a 'gap' from an external perspective, but not necessarily when assessed against the objectives of the case study. Including the attribute may not have been an original objective, and the case study may have indeed been successful in meeting its overall goal. Consequently, this analysis is distinct from but linked to the idea of a Gap Analysis. Figure 5 outlines some of the possible patterns across the case studies. These include:

- Each socio-economic assessment possesses different characteristics depending on its (1) objectives, (2) phase, (3) time, and (4) budgetary and operational limitations - these *relevancy factors* make some case studies more applicable to a LOMA context than others;
- The process-oriented case studies tended to be the most intensely and extensively participatory;
- Those socio-economic assessments at small scales tended to be the most participatory;
- Social and economic data were collected in all case studies, but the economic data was generally more detailed and comprehensive, while social data was largely relegated to demographic statistics.
- Only two case studies (Russian Arctic & Benguela Current) addressed potential human health issues. This is surprising given that human health plays an important role in shaping social well-being which, in turn, influences economic output.

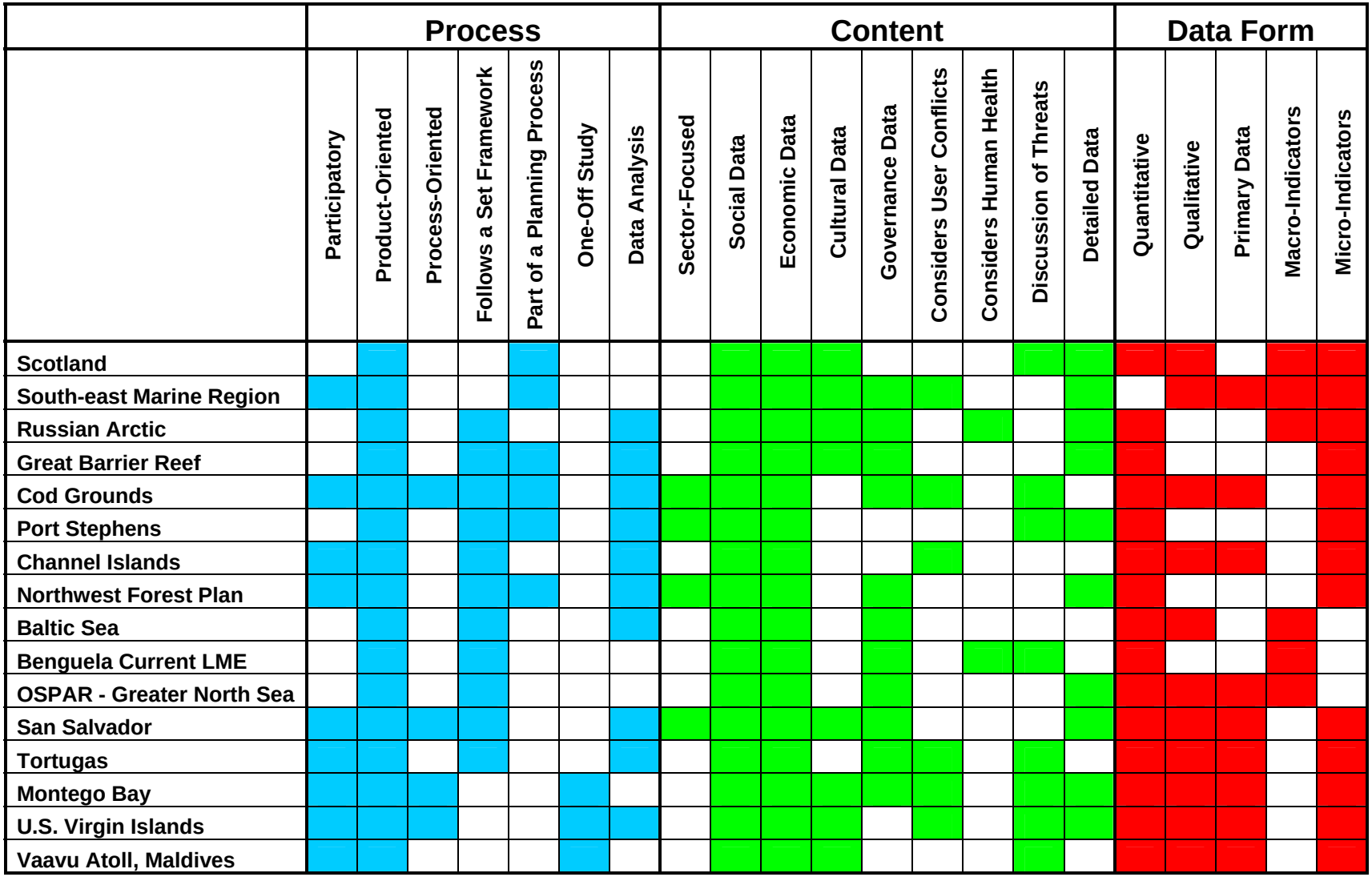

Figure 5: Analysis of Case Study Attributes

- 6 out of the 16 case studies discussed user conflicts in the management area. This is an important aspect to include, as an understanding of the reasons for conflict may have significant policy and management implications.
- Approximately half of the case studies flagged current and/or emerging threats that could potentially affect the management area. This is relevant to a LOMA context, particularly in the face of climate change and privatization of rural areas.

4.0 Overall Observations

This section provides a set of observations and opinions of the study team, representing the key messages arising out of the analysis of the case studies, as seem applicable to Canadian efforts to undertake overviews and assessments of LOMAs. Following on from the attributes section, the points noted here are also divided into process-related, content-related and data-form related sub-headings.

Process Related

- Stakeholder participation has the advantage of increasing support for the assessment and its findings, providing access to knowledge, resources and assistance and enabling the assessment team to better incorporate stakeholder concerns. A key assumption is that with stakeholder engagement and more importantly an accepted role in decision making, this approach could potentially reduce future costs for enforcement and surveillance, and support long-term monitoring programs.
- If the decision to collect primary data is made and the communities are consulted, it is essential that this information feeds back into the communities within an appropriate timeframe. Failure to do this discredits the project and personnel in the eyes of the community if they are not able to witness the outputs which they gave their time to help produce.
- It is recommended that horizontal and vertical cross-scale linkages be fostered with other government agencies and relevant institutions. These linkages may offer a venue to share the onerous task of collecting social, economic and cultural information (which can save valuable time) and also avoid overlap in data collected. This implies that in terms of

LOMAs, there is a need to recognize the jurisdictional authority of the provincial governments and work with them accordingly so as to avoid possible conflict.

- The information gathered through the SECOA process should be used to identify opportunities and threats within each LOMA. In this context long-term monitoring parameters need to be defined based on the assessment results (while noting these will be different in each Region).
- Agendas that drive these assessments also need to be considered – such as whether the initiative is being led by a Government Agency, donor, NGO or an alliance of multiple stakeholders. The collaboration and support by stakeholders and communities for such an undertaking may be influenced by the specific agenda of the lead agency and could either enhance long-term support and sustainability or foster short-tem success, which weakens once the funding or political support at the top-level, is withdrawn.

Content

- Information on governance should be included as part of a SECOA as it exerts a large influence on the surrounding enabling environment. An understanding of the underlying legislative/policy foundation is crucial to understanding how certain social, economic and cultural problems arise and what tools are available to fix them.
- Many of the case studies reviewed placed a heavy emphasis on the "economic" side of things, with much less attention paid to the social-cultural sphere. Attempts should be made to cover all aspects, maintaining as equal a distribution of attention as possible.
- Although most case studies present the social aspect entirely through demographic statistics, measuring quality of life is becoming more noticeable, especially within Australia.
- As LOMAs are massive spatial units, if primary data is collected it will be impossible to include all communities and stakeholders within the area considered, especially given a limited timeframe. From the outset, it is therefore important to identify representative or characteristic study sites that can be used as indicators for the entire region.

Data form

- The diversity across the LOMAs is a reality that should be embraced and, in doing so, a one-size-fits-all approach to conducting SECOAs should be avoided. The creation of national standards would be useful, to ensure that broad categories of information (and certain key variables) are included and that appropriate methodologies are followed, but it would not be appropriate to specify at a national level too much detail in terms of the particular information (e.g., sub-variables) that must be collected in all LOMAs.
- Ideally, a SECOA should involve the collection of both primary and secondary information (while noting that the balance between these relies on the enabling conditions within each LOMA). The secondary data complements the primary data in terms of (a) identifying gaps in existing knowledge in preparation for the field data collection, (b) ensuring the field data collection does not involve information that has already been collected, (c) providing a basis for cross-checking information collected during the field data collection and (d) providing supporting documentation for field data collection (e.g. maps of the study area).
- GIS Mapping could be an appropriate approach to utilize the information collected, both for government use as well as to bring something back to the communities. It also potentially reduces the costs of collecting primary data by incorporating socio-cultural factors within the broader economic and governance framework.
- Long-term monitoring and evaluation plans should be developed and built into the SECOA process in the early phases of planning. This can be accomplished within a short timeframe though training workshops. However, if these initiatives are to be sustainable, follow-up workshops and funding/support networks need to be planned and budgeted.
- Secondary data should be collected at different scales (i.e. national, sub-national and local), while recognizing the limitations and inaccuracies in each set of statistics.
- In the interests of time efficiency and to avoid redundancy, the SECOAs should, where possible, build on existing studies (such as those completed by industry or NGOs).

Capacity building for SECOA teams

- Any socioeconomic assessment will address a broad range of issues across different disciplines and technical fields, including the social sciences, natural sciences, and policy

analysis. Ideally the assessment team will reflect this range. If there are no team members to cover all these disciplines, it does not mean that the socioeconomic assessment cannot be carried out, but the team should be aware of these limitations and try to address them throughout the assessment.

- It is highly recommended that the SECOA team receive guidance and training. This is particularly critical when managers and team members may not feel comfortable with the processes described, do not feel they have the background and capacity to fully understand the methods and processes, and/or are unfamiliar with procedures for updating the community on the results of the studies.

5.0 Conclusions

As coastal and ocean management continues to be developed worldwide, there is an increasing need to understand both the ecological and the human context of such management initiatives. Specifically, in ocean areas designated for management, it is crucial to assess the various social, economic and cultural aspects that form the baseline within which management is to proceed. To that end, the present report has developed and implemented a new approach to enable systematic examination of overview and assessment studies relating to the human dimensions of ocean management areas, particularly at the scale of a Canadian 'large ocean management area' (LOMA). The aim is to better understand what has been and is currently being done worldwide, and ultimately to use this knowledge to initiate 'best practices' in a Canadian context.

As there has been little work carried out to date in examining the human dimensions at a LOMA scale, Canada can potentially play an important pioneering role. This includes the responsibility to disseminate the results, and particularly the lessons learned, widely enough that the LOMAs can learn from one another, and that these experiences can be shared with other countries, to foster learning on a national and global scale, and strengthen the various international networks that are seeking improved management of the various human uses of the world's oceans.

APPENDIX A: Experts Contact List

Name	Designation	Contact
Dr. Xiongzhi Xue	Professor	Marine Environmental Laboratory Ministry of Education, Environmental Science Research Center Xiamen University, Xiamen, P. R. China
Dr. Silvia Salas	Professor	CINVESTAV Km 6 Antigua Carretera a Progreso S/N Mérida Yucatán, P.C. 97310 México
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Mr. Mike Milloy	Strategic Analysis and Policy Division	Environment Canada 45 Alderney Drive Dartmouth, Nova Scotia B2Y 2N6
Dr. Marcus Haward	Associate Professor School of Government and Institute of Antarctic and Southern Ocean Studies	University of Tasmania Private Bag 22 Hobart 7001 Australia
Mr. Derek Fenton	Oceans and Coastal Management Division	Oceans and Habitat Bedford Institute of Oceanography Department of Fisheries and Oceans PO Box 1006, Dartmouth, Nova Scotia B2Y 4A2
Mr. Larry Hildebrand	Manager, Sustainable Communities & Ecosystems Integrated Ecosystems Division	Environment Canada – Atlantic 45 Alderney Drive Dartmouth, Nova Scotia Canada B2Y 2N6
Dr. Denis Bailly	Directeur Adjoint Centre de Droit et d'Economie de la Mer	Institut Universitaire Européen de la Mer Université de Bretagne Occidentale IFREMER Centre de Brest UBO-CEDEM, B.P. 70, 9280 Plouzané cedex France

Name	Designation and or Office	Contact
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Dr. Richard Kenchington	Maritime Policy Centre University of Wollongong NSW 2522 AUSTRALIA	RAC Marine Pty Ltd PO Box 588 Jamison,ACT Australia
Dr. Barbara Breen	Mauis Dolphin Education Coordinator	WWF-New Zealand PO Box 6237 Wellington 6141 New Zealand
Dr. Helen Fox	Senior Marine Conservation Biologist	U.S. Headquarters, World Wildlife Fund 1250 Twenty-Fourth Street, N.W. P.O. Box 97180, Washington, DC 20090-7180 USA
Dr. Mike Mascia	Senior Program Officer/ Social Scientist	U.S. Headquarters, World Wildlife Fund 1250 Twenty-Fourth Street, N.W. P.O. Box 97180, Washington, DC 20090-7180
Dr. Robin Mahon	Senior Lecturer	Centre for Resource Management and Environmental Studies Cave Hill Campus, The University of the West Indies University Drive Cave Hill, St. Michael, Barbados W.I.
Dr. Stephen Olsen	Director	Coastal Resources Center, University of Rhode Island 220 South Ferry Road, Narragansett, RI 02882 USA
Dr. Chua Thia-Eng	Regional Programme Director	GEF/UNDP/IMO Regional Programme on Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) P.O. Box 2502, Quezon City 1165, Philippines
Dr. Alan Pickaver	Head of Policy and Projects Coastal Union	EUCC - The Coastal Union Post box 11232, Leiden, Netherlands

Appendix B: Criteria used to guide case study selections

Case studies	LOMA Characteristics							Experts recommendations and case studies with frameworks		
	Cover an area that is sufficiently large enough to provide an appropriate context for management action in consideration of ecosystem characteristics +100,000 km2	Currently under pressure from human activities	Expected to be under pressure from human activities in the imminent future	A wide array of marine/terrestrial users competing for limited oceans/land space	Jurisdictional complexity	Unique ecosystems/ high biological productivity	Culturally distinct settlements.	Experts-case study	Experts -frameworks	Framework
Scottish Coast										
South-East Marine Region	2,000,000 km^2							Marcus Haward		Bioregional planning
Great Barrier Reef Marine Park	344,400 km^2							Richard Kenchington/ Marcus Haward		
Russian Arctic	6,000,000.80 km^2									GWIA
Channel Islands National Marine Sanctuary	4, 263.37 km^2								Larry Hildebrand	NOAA Coastal Services Center's "Applying Social Science to Coastal Management"
Port Stephens - Great Lakes Marine Park	972 km^2							Barbara Breen		National Representative System of Marine Protected Areas (NRSMPA)
Cod Grounds Marine Protected Area	3.1 km^2								Merle Showman DFO: SEIA	SEIA
North West Forest	90, 000.07 km^2									
Benguela Current	1, 456, 812 km^2								Robin Mahon- LMA/GEF	LMA
Baltic Sea	41 5,000 km^2							Denis Bailly		GWIA
Greater North Sea	574, 977.36 km2							Denis Bailly - OSPAR		OSPAR
Vaavu Atoll										
Montego Bay	15.3 km2									
Virgin Islands	346.36 km^2. (land)									
Tortugas Ecological Reserve, Florida	3, 498.50 km^2								Larry Hildebrand	NOAA Social Science Research
San Salvador	3.8 km^2								Robert Pomeroy Silvia Salas - SocMon	SocMon/How is your MPA doing

Note: Shading indicates the applicability of the statement in the column heading to the case study specified in the given row

APPENDIX C: Presence/Absence of Variables in Case Studies

Code	LOMA scale case studies
A	Channel Islands National Marine Sanctuary
B	Cod Grounds Marine Protected Area
C	Great Barrier Reef Marine Park
D	North West Forest
E	Port Stephens - Great Lakes
F	Russian Arctic
G	Scottish Coast
H	South-East Marine Region

LOMA scale case studies

Category	Data sub-categories	A	B	C	D	E	F	G	H
Cultural	Cultural and other differences within the Region								1
	Denial of rights & impact of this denial								1
	Misunderstanding of rights								1
	A voice in management/management rights								1
	Access								1
	Commonwealth legislation								1
	Contributing to planning outcomes								1
	Cultural and archaeological sites							1	
	Cultural and traditional relationships								1
	Cultural heritage								1
	Decision-making								1
	Different economies								1
	Discrimination								1
	Environmental degradation								1
	Environmental protection								1
	Food production						1		
	Governing legislation and institutions for cultural heritage								1
	Hunting and gathering								1
	Impacts of commercial activity								1
	Increasing involvement								1
	Indigenous issues and concerns about marine environmental and resource management								1
	Interactions and overlaps between Indigenous marine other uses								1
	International consideration of Indigenous marine issues-International								1
	Fisheries; Marine protected area- Cultural heritage management								1
	Issues of concern								1
	Legal and policy developments in New Zealand, Canada and USA								1
	Legal obligations and institutional structures								1
	Location of main marine cultural heritage sites in Region (mapped)								1
	National heritage value-Lighthouses			1					
	National heritage value-Ruins			1					
	National heritage value-Shipwrecks			1					

Category	Data sub-categories	A	B	C	D	E	F	G	H
Cultural	Native title								1
	Native title claims and Indigenous Land Use Agreements (mapped)								1
	Native title determinations and agreements relating to marine environment and resources								1
	Native Title Representative Bodies			1					
	Number of shipwrecks in Region								1
	Pre-colonial relationship between Indigenous people and the sea and elements continuing to present day								1
	Protection of cultural heritage								1
	Recent Commonwealth initiatives and policies (related to enhancing recognition of Indigenous interests in the sea)								1
	Recognizing rights								1
	Recreational resources						1		
	Relationships and Rights								1
	Relationships with the reef			1					
	Representation and negotiation								1
	Resource sharing through co-management								1
	Scope of cultural heritage								1
	Significant legal judgments								1
	Social practices (reef use)			1					
	State government initiatives to involve Indigenous people in ocean management								1
	State legislation								1
	Traditional activities (hunting, fishing, reindeer herding)						1		
	Traditional ownership rights			1					
	Traditional practices (i.e. hunting)			1					
	Types of vessels shipwrecked								1
Cultural Total				**8**			**3**	**1**	**42**

Category	Data sub-categories	A	B	C	D	E	F	G	H
Economics	# recreational fishing vessels			1					
	# visitors			1					
	% reliance on marine park					1			
	Proportion of those employed who work in commercial fishing		1						
	# farms						1		
	Agency jobs				1				
	Annual # of visitors							1	
	Average daily expenditure by visitors			1					
	Average size of farms						1		
	BLM Jobs in the Woods				1				
	Boat ramps			1					
	Business capital and running costs		1						
	Changes in number of fishing businesses over time					1			
	Charter & game fishing GVP			1					
	Charter/Party Boat or Guide Service – For Hire Operations	1							
	Classification and organization of enterprises by type						1		
	Cod Grounds catch as a proportion of overall catch		1						
	Commercial Fisheries and Aquaculture							6	
	Commercial Fishing and Kelp Harvesting	1							
	Community economic assistance				1				
	Demand for raw materials in domestic & world markets						1		
	Direct GVP			1					
	Direct non-use values			1					
	Distribution of Catch/Ex Vessel Value	1							
	Economic & resource diversification							1	
	Economic diversity		1						
	Economic importance of industries in the GBR Catchments and Lagoon-Total net present value			1					
	Ecosystem services			1					
	Employees					1			
	Employment (# people employed)			1					
	Employment (FTEs)			1					
	Estimated proportion of combined catch per estuary					1			
	Estimates of total economic value for other reef systems MPAs			1					
	Estimates of total economic value for other reef systems and marine parks-Annual value per hectare			1					
	Estimates of total economic value for other reef systems and marine parks-Net present value per hectare			1					
	Fishing history, current fishing and plans for future fishing		1						
	Fishing methods		1						
	Forecast growth in tourism GVP			1					
	Forecast GVP and value-added for GBR fisheries			1					
	Forestry, Fisheries & Aquaculture-Catch (tones)						1		
	FS Old-Growth Diversification Fund				1				
	FS Rural Community Assistance				1				
	GDP of region (% of Russia's total GDP)						1		
	GVP			1					

Category	Data sub-categories	A	B	C	D	E	F	G	H
Economics	Spatial representation of GBR tourist usage			1					
	Impacts to employment in commercial fisheries				1				
	Impacts to employment in natural resources				1				
	Impacts to employment in non-renewable resources				1				
	Impacts to employment in range fed cattle				1				
	Impacts to employment in recreation services				1				
	Impacts to forestry related industry				1				
	Impacts to timber harvesters				1				
	Impacts to timber industry				1				
	Impacts to timber industry employment				1				
	Impacts to timber related industry				1				
	Impacts to timber related industry employment				1				
	Income per capita						1		
	Indirect GVP			1					
	Industrial production by sector (%)						1		
	Licensed boat capacity (number of passengers)					1			
	Local economic development							1	
	Location and description of oil and gas activities in the Region								1
	Lump-sum equivalent for GBR tourist values			1					
	Lump-sum equivalent of future recreational fishing values			1					
	Lump-sum value of GBR fisheries			1					
	Major species landed (species, catch, primary method).					1			
	Marine and coastal tourism activities								1
	Medical resources/Bioprospecting			1					
	Multiplier			1					
	Natural resource potential (hydrocarbons, minerals)						1		
	Nature (type) of cargo handled							1	
	Nature of fishing		1						
	Northern deliveries overview						1		
	Number of commercial fisheries in the Region								1
	Number of fishing businesses (operators) & contact details					1			
	Number of offshore platforms built in the Region								1
	Number of operators					1			
	Number of visits to the coast per year								1
	Oil and Gas							1	
	Passengers					1			
	Payments in lieu of taxes				1				
	Payments to counties with legislative mitigations				1				
	Payments to counties without legislative mitigations				1				
	Payments to county governments				1				
	Per unit values of fish caught per fishery					1			
	Procurement contracting opportunities				1				
	Profile of fishing		1						
	Projections for growth in recreational fishing participation			1					
	Projections for recreational fishing vessels and total economic value			1					

Category	Data sub-categories	A	B	C	D	E	F	G	H
Economics	Proportion of those employed who work in commercial fishing, seafood processing and fish wholesaling		1						
	Quantity, unit price and unit cost; or					1			
	Quantity, unit price, % net revenue					1			
	Recreational fishing			1					
	Recreational Fishing and Consumptive Diving	1							
	Revenue and cost					1			
	Species commonly caught		1						
	Three industries with the highest employment		1						
	Total annual expenditure			1					
	Total employment in the Region								1
	Total employment in the tourism sector			1					
	Total expenditure by visitors (per annum)			1					
	Total number of people employed in marine-based tourism								1
	Total number of people employed in the oil and gas industry in the Region								1
	Total turnover of operators or total catch					1			
	Total value of commercial fisheries in the Region								1
	Total value of oil and gas deposits in the Region								1
	Tourism						1	4	
	Transport in the region (tones/year)-coastal, transit, export, import						1		
	Trips					1			
	Types of Fisheries					1			
	Value Added (% of GVP)			1					
	Value of Commonwealth fisheries								1
	Value of marine-based tourism								1
	Value of oil and gas deposits in the Region to the Australian economy								1
	Value of State fisheries								1
	Value of the sites to the economy							1	
	Volume and value of catch		1						
	Volume and value of exports through GBR ports			1					
	Volume of cargo handled (tonnes)							1	
	Willingness to pay (WTP) to visit islands or reefs in the GBRMP			1					
	Willingness to pay for recreational fishing experience ($)			1					
Economics Total		**4**	**12**	**34**	**21**	**16**	**12**	**17**	**14**

Category	Data sub-categories	A	B	C	D	E	F	G	H
Governance	Agreements & Laws						1		
	Annual budget for Reef Cooperative Research Centre			1					
	Annual GBR related expenditure by Commonwealth Agencies			1					
	Annual GBR related expenditure by Queensland Agencies			1					
	Applicable legislation-International conventions			1					
	Applicable legislation-National strategies			1					
	Barriers to collaboration				1				
	Benefits of collaboration				1				
	Budget allocations to Plan-area forests				1				
	Changes affecting fishers in the region		1						
	Contract awards to rural communities and affected counties				1				
	Councils						1		
	Existing literature that describes the management and effectiveness of AMAs and PACs.				1				
	Future threats							1	
	GBRMP annual budget			1					
	Legislation relevant to GBRMP which include reference to cultural heritage values			1					
	Level of engagement between communities and agencies				1				
	Location of contractors				1				
	Naval Activity							3	
	Number and value of contracts				1				
	Number of agency offices containing line officers (agency decision makers)				1				
	Number of local government areas in the coastal margin								1
	Number of permanent and other (part-time, temporary) FS and BLM full-time-equivalent (FTE) positions				1				
	Power Generation							3	
	Procurement spending by work type				1				
	Purpose of collaborations and partnerships				1				
	Regulations		1						
	Shoreline Coastal Protection			1					
	Total procurement spending				1				
	Types of collaborative forest stewardship activities				1				
	Volunteerism				1				
Governance Total			**2**	**8**	**15**		**2**	**7**	**1**

Category	Data sub-categories	A	B	C	D	E	F	G	H
Social	# minority groups						1		
	Low income households & high income households		1						
	20 year population projections			1					
	ABS Index of Relative Disadvantage			1					
	Aesthetic value			1					
	Alcoholism (%)						1		
	Aspiration – what would your group like to see in the Region's management plan?								1
	Average age per community								1
	Average annual household income per community in coastal margin								1
	Average annual increase in population			1					
	Average annual non-metropolitan household income per year								1
	Average weekly household income per community of the Region								1
	Capacity building								1
	Catch currently landed at different cooperatives		1						
	Census indicators relating to population, employment, education				1				
	Child & Elderly dependency ratios		1						
	Common diseases						1		
	Diet (changes in nutritional patterns)						1		
	Education			1					
	Employment, training and education								1
	Environmental and scarcity values of bioregions			1					
	Environmental and scarcity values of protected areas			1					
	Fertility and mortality rates						1		
	Gender and age structure						1		
	Higher education (%)						1		
	Historic value-Non-indigenous uses, places & values			1					
	Historic value-Register of Shipwrecks			1					
	How can the South-east Marine Plan meet the needs of Indigenous people?								1
	Importance of eight specified areas for spending tax money in the Region								1
	Infant mortality rate						1		
	Issues that should be reflected in the development of the Regional Marine Plan								1
	Knowledge of current management arrangements								1
	Knowledge of Macquarie Island								1
	Knowledge of marine-conservation-related terms -Ecosystem								1
	Knowledge of marine-conservation-related terms-Australia's Oceans Policy								1
	Knowledge of marine-conservation-related terms-Biodiversity								1
	Knowledge of marine-conservation-related terms-Ecosystem-based management								1
	Knowledge of marine-conservation-related terms-Habitat								1
	Knowledge of marine-conservation-related terms-Indigenous rights and values								1
	Knowledge of marine-conservation-related terms-Multi-use management								1

Category	Data sub-categories	A	B	C	D	E	F	G	H
	Knowledge of marine-conservation-related terms-National Oceans Office								1
	Knowledge of marine-conservation-related terms-Precautionary principle								1
	Knowledge of marine-conservation-related terms-South-east Marine Region								1
	Knowledge of uses in the Region								1
	Level of acceptance for specified uses in the Region: Australian commercial fishing								1
	Level of acceptance for specified uses in the Region: Commercial shipping								1
	Level of acceptance for specified uses in the Region: Conservation								1
	Level of acceptance for specified uses in the Region: Indigenous use								1
	Level of acceptance for specified uses in the Region: International commercial fishing								1
	Level of acceptance for specified uses in the Region: Marine cultural heritage								1
	Level of acceptance for specified uses in the Region: Mining								1
	Level of acceptance for specified uses in the Region: Petroleum/gas exploration								1
Social	Level of acceptance for specified uses in the Region: Recreation								1
	Level of acceptance for specified uses in the Region: Recreational fishing								1
	Level of acceptance for specified uses in the Region: Tourism								1
	Level of education of employed population						1		
	Main Funding source								1
	Marine-focused festivals								1
	Marine-related training								1
	Marital status of men						1		
	Markets for fish from the Cod Grounds		1						
	Mean income			1					
	Measures to achieve these aspirations								1
	Median population age		1						
	Medical care						1		
	Membership numbers								1
	Migration							1	
	Migration rate (% change in population)						1		
	Morbidity structure						1		
	Most heavily populated areas of coast			1					
	National Average annual household income per year								1
	National average of people who left school at age 16								1
	Opinion about Government spending on looking after the deeper ocean in the Region								1

Category	Data sub-categories	A	B	C	D	E	F	G	H
Social	Percentage of people in the Region who left school at age 16								1
	Percentage of population with higher education qualifications per community								1
	Population			1			1		
	Population change							1	
	Population per community								1
	Potential Direct Impacts of Proposed MPA on Commercial Fishers-Demographic characteristics of fishers and their families		1						
	Potential Direct Impacts of Proposed MPA on Commercial Fishers-Education level		1						
	Potential Direct Impacts of Proposed MPA on Commercial Fishers-Family income		1						
	Potential Direct Impacts of Proposed MPA on Commercial Fishers-Gender of fisher operating boat		1						
	Potential Direct Impacts of Proposed MPA on Commercial Fishers-Likely impacts on fishing businesses currently fishing		1						
	Potential Direct Impacts of Proposed MPA on Commercial Fishers-Likely impacts on fishing businesses not currently fishing		1						
	Potential Direct Impacts of Proposed MPA on Commercial Fishers-Type of family unit		1						
	Potential Direct Impacts of Proposed MPA on Commercial Fishers-Years working in commercial fishing		1						
	Potential impacts of proposed MPA on fish cooperative sales outlets & other markets		1						
	Potential Socio-economic Impacts on Fish Cooperatives-Current business structure and history of the cooperatives		1						
	Prices and costs of selling product to different markets		1						
	Primary education (%)						1		
	Prioritize values for the Region								1
	Private Household Boat Use Estimation	1							
	Proportion of 16 year olds in full time education		1						
	Proportion of families receiving government pensions		1						
	Research Institutions			1					
	Residents vs. Nonresidents	1							
	Scientific and Education Values	1							
	Secondary and special education (%)						1		
	Self-employed					1			
	Self-reported levels of knowledge about the Region								1
	Sex ratio (# males/100 females)		1						
	Social and economic conditions change in % of poverty				1				
	Social and economic conditions change in % of unemployment				1				
	Social and economic conditions change in age				1				
	Social and economic conditions change in educational attainment				1				
	Social and economic conditions change in employment by industry				1				
	Social and economic conditions change in income distribution				1				

Category	Data sub-categories	A	B	C	D	E	F	G	H
Social	Social and economic conditions change in educational attainment				1				
	Social and economic conditions change in employment by industry				1				
	Social and economic conditions change in income distribution				1				
	Social and economic conditions change in median household income				1				
	Social and economic conditions change in population change				1				
	Social and economic conditions change in population density				1				
	Social and economic conditions change in race				1				
	Social and economic conditions change in school enrolment				1				
	Social and economic conditions change in socioeconomic well-being				1				
	Social and economic conditions change in total population				1				
	Social disadvantage (poverty, available job opportunities, low cost housing etc.)							1	
	Socio-economic Index for Areas (SEIFA Index)								1
	Socio-economic Profile of Potentially Impacted Communities-Annual population growth		1						
	Socio-economic Profile of Potentially Impacted Communities-Total dependency ratio		1						
	Socio-economic Profile of Potentially Impacted Communities-Total population		1						
	Socioeconomic well-being scores				1				
	Total indigenous population			1					
	Total population			1			1		
	Total population of coastal margin								1
	Unemployment (%)						1		
	Unemployment Rate			1					
	Unemployment rate & change in unemployment rate		1						
	Unemployment rates								1
	Value - What in the Region is important to your community group now?								1
	Value to Australians-Coral reefs			1					
	Value to Queenslanders-species			1					
	Values and Aspirations for the Region								1
Social Total		3	23	18	15	1	18	3	52
Grand Total		7	37	68	51	17	35	28	109

Large scale multi-country case studies

Category	Data sub-categories	Baltic Sea	Benguela Current	Greater North Sea
Economics	% Market share of container transfers - in main ports			1
	% of Greater North Sea region fished more than once per year			1
	Agriculture: Land use structure (2001-2002)	1		
	Aquaculture: Aquaculture production for human consumption	1		
	By catch biomass per year for each fishery			1
	Catches by private fishing firms		1	
	Catches by state-owned companies		1	
	Categories of increase in fleet capacity			1
	Combined landings of species per country			1
	Commercial activity		1	
	Domestic consumption of fish (kg/person/annum)		1	
	Economic importance of the industry (compared to other industries in the nation)		1	
	Export products – % of each of the total revenue from the fishery sector		1	
	Fish processing industry outputs (by product type) – e.g. salt fish, crabs,		1	
	Fishing effort per year for different gear types			1
	Fishing: Landings (1963-2000)	1		
	Forestry	1		
	Formal enterprise		1	
	Gas production – per country			1
	GDP (in 2001)	1		
	GDP by sector	1		
	GDP growth (annual % change)	1		
	GDP per capita	1	1	
	Gear types			1
	Government's total potential revenue from alluvial diamonds		1	
	Growth in number of small private fishing firms (% of catch)		1	
	Industry; Industrial production growth rate	1		
	Inflation rate		1	
	International shipping traffic measures in main ports			1
	Investment capital (overview)		1	
	Key export markets		1	
	Landings for main species in Greater North Sea region			1
	Landings from industrial fisheries			1
	Livestock farming		1	
	Location		1	
	Locations of largest ports			1
	Main industries along coasts of Greater North Sea			1
	Number of artisanal fishermen		1	
	Number of berths in marinas			1
	Number of boats		1	
	Number of controlled landing places		1	
	Number of one day visitors			1

Category	Data sub-categories	Baltic Sea	Benguela Current	Greater North Sea
Economics	Number of overnight stays (and % in specified seasons)			1
	Number of platforms - per country			1
	Oil and gas field locations (mapped)			1
	Oil and gas pipeline information (total length, locations, etc.)			1
	Oil production - per country			1
	Output as a percent of the country's GDP		1	
	Percentage of GDP		1	
	Petroleum discoveries (mapped)			1
	Power generation activities from natural sources (tidal, wave, wind)			1
	Production average (barrels/day)		1	
	Quantity of container transfers - in main ports			1
	Revenue from fish and fish products from exports (USD)		1	
	Shipping accidents in Greater North Sea			1
	Shipping activities in Greater North Sea			1
	Species caught for human consumption			1
	Stock biomass per year			1
	Total allowable catches per stock per year			1
	Total cargo shipments in main ports			1
	Total combined landings of species			1
	Total discharges of oil (tonnes) from offshore installations in the Greater North Sea area			1
	Total estimated proven recoverable reserves of crude petroleum (barrels)		1	
	Total fishing effort in Greater North Sea region			1
	Total national catch (tonnes)		1	
	Total number of ships in top 50 ports			1
	Total number of ships passing and crossing specific straits and canals			1
	Total number of workers in fisheries sector		1	
	Total output per annum		1	
	Total reported foreign catch (tonnes)		1	
	Tourism: Value of annual foreign income	1		
	Tourist potential (existence of Beaches)		1	
	Tourist potential (existence of Hot springs)		1	
	Tourist potential (existence of Hotel facilities)		1	
	Tourist potential (existence of National parks)		1	
	Tourist potential (existence of Tour operators)		1	
	Trade in commodity goods		1	
	Transport: share of transport in GDP	1		
	Trawling total area (km2)			1
	UNDP Human Development Index		1	
	Volume of shipments in main ports per year			1
Economics Total		**11**	**35**	**36**

Category	Data sub-categories	Baltic Sea	Benguela Current	Greater North Sea
Governance	Action taken by Greater North Sea states to reduce inputs			1
	Activities			1
	Advisory bodies			1
	Coastal defence activities - per country			1
	Coastal land use		1	
	Distribution of main coastal industries			1
	Governing and Advisory Bodies	1		
	Instruments for protecting the marine coastal environment			1
	International Co-operation and regional directives	1		
	Key legislation governing the marine fisheries		1	
	Key research institutes (name, department, HQ location & funding)		1	
	Land reclamation projects - per country			1
	Legislated areas for conservation and man-made estuaries			1
	Legislation and Policies			1
	Legislation for protecting marine archaeological relics			1
	Level of crime (overview)		1	
	List of conventions and specific laws that affect water use in the region	1		
	Location and types of munitions dumped at sea since WWI			1
	Location of most industrialized areas			1
	Military training areas (mapped)			1
	Number of provinces on coastline		1	
	Percentage of agriculture land - per country			1
	Principles			1
	Regulating bodies			1
	Relevant International agreements			1
	Tools/measures-National			1
	Tools/measures-Regional			1
	Trends in the use of pesticides in agriculture from North Sea countries			1
Governance Total		**3**	**5**	**20**

Category	Data sub-categories	Baltic Sea	Benguela Current	Greater North Sea
Social	Adult literacy rate		1	
	Annual population increase		1	
	Employment rate		1	
	Infant mortality rate		1	
	In-Migration			1
	Life expectancy		1	
	Life expectancy at birth	1		
	Maintenance of infrastructure or social services (overview)		1	
	Number of doctors		1	
	Number of hospital beds per 1000 inhabitants		1	
	Number of hospitals		1	
	Number of inhabitants per doctor		1	
	Number of nurses		1	
	Percentage of labour force employed in the armed forces		1	
	Percentage of population in each of the major coastal urban centers		1	
	Percentage of the population living in urban centers		1	
	Population		1	
	Population density (maps)	1		
	Population density per country (persons/km2)			1
	Population in catchments area	1		
	Population per country in the Greater North Sea area			1
	Poverty rate (% population living below poverty line)	1		
	Pupil/teacher ratios by city		1	
	Rail network (overview)		1	
	Rate of urbanization		1	
	Road network (overview)		1	
	Total population in catchments area			1
	Under five mortality rate		1	
	Unemployment rates	1		
	Urbanization rate	1		
	Water resources (overview)		1	
Social Total		**6**	**21**	**4**
Grand Total		**20**	**61**	**60**

Small-scale case studies

Category	Data sub-categories	Montego Bay	San Salvador	Tortugas Ecological Reserve	Vaavu Atoll	Virgin Islands
Culture	Attitudes towards association leadership and decision-making		1			
	Attitudes towards collective action		1			
	Attitudes towards the distribution/sharing of responsibility for fisheries management, willingness to support a similar project in the future		1			
	Concerns about MPA status					1
	Current membership in village organization		1			
	Decision-making arrangements: municipal and provincial levels		1			
	Importance to the user group community	1				
	Job satisfaction		1			
	Perceived socio-cultural and economic impacts					1
	Specific resources of the user group to benefit reef management	1				
	Stakeholder understanding of a MPA					1
Culture Total		**2**	**6**			**3**

Category	Data sub-categories	Montego Bay	San Salvador	Tortugas Ecological Reserve	Vaavu Atoll	Virgin Islands
Economics	Scale of dependency					1
	Size and frequency of activity (e.g. number of guests/week, total trips/week, occupied hotel rooms/week)	1				
	Aquarium fish		1			
	Average price per pound					1
	Benefits of the proposed TERSA to recreational users			1		
	Boating					1
	Boating-Frequency/seasonality					1
	Boating-Scale of dependency					1
	Capital outlay	1				
	Catch (lobster, reef fish, mackerel, shrimp)			1		
	Changes in numbers and types for the activity	1				
	Commercial boating-Frequency/seasonality					1
	Commercial boating-Locations of stakeholder-identified boating use					1
	Commercial boating-Scale of dependency					1
	Consumer' surplus			1		
	Dates/times check traps	1				
	Depth of fishing	1				
	Direct monetary value					1
	Distance from shore of fishing	1				
	Diving & water sports					1
	Diving-Frequency/seasonality					1
	Diving-Locations of stakeholder-identified diving					1
	Diving-Scale of dependency					1
	Education level	1				
	Existence of favourite buyer & length of relationship,		1			
	Expenditure patterns					1
	Fishing days per week	1				
	Fishing ground		1			
	Frequency/seasonality					2
	Goods	1				
	Harvest revenue			1		
	How has changed over time	1				
	Income level	1				
	Landing beaches	1				
	Location/activities for majority of time when not fishing	1				
	Locations of fishing activity					1
	Locations of stakeholder-identified boating use					1
	Locations of stakeholder-identified educational/research/ ecotourism uses					1

Category	Data sub-categories	Montego Bay	San Salvador	Tortugas Ecological Reserve	Vaavu Atoll	Virgin Islands
Economics	Locations of stakeholder-identified recreational fishing activity					1
	Locations of stakeholder-identified uses					1
	Long term benefits from replenishment effects			1		
	Major economic activities of the 5 island communities				1	
	Making a profit?	1				
	Market and non-market economic values			1		
	Market orientation		2			
	Market outlets		1			
	Market structure		1			
	Method of fishing (absolute and percentage of total fishers at beach)	1				
	Number of boats	1				
	Number of family members supported			1		
	Number of fishers that rely on fishing as primary or sole source of income	1				
	Number of individuals involved	1				
	Number of recreational fishers					1
	Number of registered & reporting commercial fishers					1
	Number of registered fishers	1				
	Number of trades,		1			
	Number of traps set per boat	1				
	Numbers and types of clients	1				
	Occupation and dependence on commercial fishing			1		
	Operators in the study area			1		
	Other	1				
	Per capita income ($)					1
	Per month (to measures seasonality)	1				
	Percentage of fishers living in communities adjacent to launching site	1				
	Place sold		1			
	Pounds					1
	Preference of fishing method	1				
	Presence of a share arrangement	1				
	Primary hauling port and fish house usage			1		
	Primary output			1		
	Producers surplus/Economic rent			1		
	Proportion of revenues that is profit	1				

Category	Data sub-categories	Montego Bay	San Salvador	Tortugas Ecological Reserve	Vaavu Atoll	Virgin Islands
Economics	Range of services or operations (e.g. number of operations)	1				
	Quantity caught per type of target fish (absolute and percentage of total fishers at beach)	1				
	Rec Fishing-Frequency/seasonality					1
	Rec-fishing Scale of dependency					1
	Reef related economic activities and their population distribution				1	
	Repairs and depreciation	1				
	Scale of dependency					1
	Services	1				
	Size and nature of revenues	1				
	Size, location and frequency of activities	1				
	Subsistence or market oriented		1			
	Substitution			1		
	Swimming, camping etc. Frequency/seasonality					1
	Swimming, camping etc-Scale of dependency					1
	Taxes	1				
	Technical: fishing gear, information sources on gear types, fish harvest sharing system		1			
	Time involved	1				
	Time to travel to the trap locations, haul and reset the traps	1				
	Total biomass (lb) caught per fishing method per boat per week	1				
	Total catch (pounds)					1
	Total economic value					1
	Total number of fishers by time worked in fishing and fishing beach (Full, P/T or No-time)	1				
	Total output			1		
	Total reported trips					1
	Tourism					1
	Type of bait	1				
	Type of equipment	1				
	Type of fish targeted	1				
	Type of operation	1				
	Types of catch	1				
	Types of equipment used	1				
	Value of fishery products		1			
	Value of product		1			
	Water sports-Locations of stakeholder-identified water sports use					1
	Water sports-Scale of dependency					1
	What has contributed to this change	1				
	What is involved	1				
Economics Total		**46**	**13**	**14**	**2**	**36**

Category	Data sub-categories	Montego Bay	San Salvador	Tortugas Ecological Reserve	Vaavu Atoll	Virgin Islands
Governance	Agricultural & animal wastes and run-off					1
	Attitudes towards rules		1			
	Automobile & boat related pollution					1
	Boating vs. the natural environment					1
	Choice of rule		1			
	Ciguatera					1
	Collective choice rules		1			
	Commercial fishers vs. other user groups					1
	Concerns for management of the Montego Bay Marine Park	1				
	Constitutional rules		1			
	Coral diseases & coral bleaching					1
	Crowding			1		
	Current perceptions of rule enforcement and violations		1			
	Decision-making at the village level		1			
	Definition of study area and alternatives			1		
	Degradation of water quality					1
	Development vs. the natural environment					1
	Earthquakes & tsunamis					1
	Extent that user group become actively involved in marine environmental management	1				
	General attitude and outlook toward activity (of management, staff, and/or users)	1				
	GIS database			1		
	Habitat degradation					1
	Household chemicals and wastes/septic wastes					1
	How do the other groups affect the user's use	1				
	Industrial/commercial discharges					1
	Informal and formal operational rules		1			
	Initiatives to reduce conflict					1
	Inter/intra government conflicts					1
	Involvement with the Park	1				
	Jet skis vs. fishers and swimmers					1
	Kind of formal or informal structure	1				
	Kinds of formal and informal organizations that exist for the user group (including social and professional)	1				
	Kinds of relations with government officials	1				

Category	Data sub-categories	Montego Bay	San Salvador	Tortugas Ecological Reserve	Vaavu Atoll	Virgin Islands
Governance	Level of trust in political institutions	1				
	Measurement of non-market economic values			1		
	Need for marker buoys		1			
	Needed Park actions	1				
	Non-extractive user groups and coral reef health					1
	Oil/waste oil					1
	Over-fishing					1
	Perception of reef conditions	1				
	Perceptions of impacts from water sports operations, hotel operations, fishing, farming, cruise ships, manufacturing littering, city sewage, others	1				
	Perceptions of the Park	1				
	Physical: customary, political, legal and technical boundaries		1			
	Pressure on traditional uses, dislocation and relocation					1
	Private property rights, public access and natural resource protection					1
	Projected Demand for Marine Resources					1
	Property rights		1			
	Public policy, rules and regulations vs. user groups					1
	Recorded violations		1			
	Recreation related threats					1
	Relations and interactions with other user groups (including fishing, water sports, hotel operations, farming, cruise ships, and manufacturing)	1				
	Relocation			1		
	Sedimentation& run-off					1
	Services from external organization		1			
	Sewage					1
	Stakeholder identified stresses & threats					1
	Storms/hurricanes					1
	The role that fishermen/operators/hoteliers can play in Park management	1				
	Top three concerns for the Park	1				
	Top three impacts on the reef	1				
	Tourism vs. the natural environment					1
	Trash					1
	Types of rules		1			
	Watershed degradation					1
Governance Total		**17**	**13**	**5**		**30**

Category	Data sub-categories	Montego Bay	San Salvador	Tortugas Ecological Reserve	Vaavu Atoll	Virgin Islands
Social	% males & % females				1	
	Age	2	1			
	Age and experience			1		
	Age composition of the household members		1			
	Annual average gross pay ($)					1
	Areas for solid waste disposal				1	
	Biological: live coral cover, fish catch and fish species, fishing grounds, perceived trends in the condition of fishery resources, perceived importance of the Marine Sanctuary		1			
	Civilian employment					1
	Civilian labour force					1
	Community sanitary status				1	
	Drinking water storage capacity				1	
	Economic sector					1
	Economic status	1				
	Education	1	1			
	Educational Attainment				1	
	Electric power generation and availability				1	
	Ethnic background	1				
	Ethnic diversity					1
	Extent of environmental awareness and concerns	1				
	Fisher community		1			
	Gender	1				
	High school graduates					1
	Household assets		1			
	Household size		1		1	
	Importance to particular groups of people	1				
	Importance to the larger community	1				
	Labour	1				
	Literacy Rate				1	
	Memberships in organizations			1		
	Nature (Independence level)	1				
	Number of family health workers				1	
	Number of health centers				1	
	Number of health posts				1	
	Number of households				1	
	Number of local practitioners				1	
	Number of midwives				1	
	Number of persons who perform circumcision				1	
	Number of regional hospitals				1	
	Number of schools				1	
	Number of traditional healers				1	
	Occupational multiplicity and dependence on fishery resources		1			
	Population					1

Category	Data sub-categories	Montego Bay	San Salvador	Tortugas Ecological Reserve	Vaavu Atoll	Virgin Islands
Social	Race/ethnicity			1		
	Sex	1				
	Social and recreational clubs-Number				1	
	Social and recreational clubs-Number of members				1	
	Social and recreational clubs-Period of operation				1	
	Social and recreational clubs-Purpose				1	
	Total income and number of jobs			1		
	Total population				1	
	Types of jobs	1				
	Unemployment rate					1
	University graduates					1
	What would use group like to see for better management of the Park?	1				
Social Total		**14**	**8**	**4**	**23**	**9**
Grand Total		**79**	**40**	**23**	**25**	**78**