



Australian Government
Bureau of Rural Sciences

Socio-economic Impact Assessment Toolkit

A guide to assessing the socio-economic impacts of
Marine Protected Areas in Australia

Prepared for the Australian Government Department of the Environment and Heritage by:
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Australian Government
**Department of the
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Introduction and overview

Consistent with Australia's Oceans Policy 2000, the Australian Government, through the Department of the Environment and Heritage (DEH), is developing the National Representative System of Marine Protected Areas (NRSMPA).

The Australian Government released a policy statement on Marine Protected Areas (MPAs) and Displaced Fishing in January 2004. That policy recognises that the declaration of MPAs may have adverse social and economic impacts on sections of the community, and that in such circumstances there may be grounds for providing structural adjustment assistance. As stated in the policy, this is because the declaration of an MPA is a resource allocation process whereby marine resources are effectively reallocated from generating a private benefit such as fishing to a broader public good of biodiversity conservation.

Therefore, in developing MPA proposals it is important to assess social and economic implications. Social and economic assessment of the impacts of the introduction of an MPA can assist in planning and decision-making and guide structural adjustment issues. Such assessment ideally should be undertaken as part of the MPA development process so that measures to address socio-economic impacts, where deemed necessary, can be implemented as an integral part of the MPA declaration process.

This toolkit has been developed to provide policy makers and the fishing sector with a general background and introduction to methods for assessing the socio-economic impacts within a fisheries context of proposals to declare MPAs in Australia. In particular, the toolkit focuses on potential impacts on the fishing industry, including related businesses and communities associated with fishing activities.

The toolkit comprises a general guide to undertaking socio-economic impact assessment (SEIA), followed by specific guides to methods and sources of information which can be used in assessing the potential impacts of proposed MPAs on these selected sectors. It provides a range of options for assessing social and economic impacts, and advice on appropriate methods for particular situations. It covers methods for assessing direct and indirect impacts. Uses and limitations of each method are included, such as likely cost and time required to implement, and the type of information each method can provide. DEH will use the toolkit to identify the most appropriate approach for socio-economic assessment of the impacts of candidate MPAs, initially in the South-east marine region.

The toolkit draws on the wide range of methods for SEIA, and presents those most applicable in the MPA context. Their selection is based on a review of SEIA literature in general, and on lessons learned from previous social and economic impact assessments related to MPAs and marine-based activities in Australia and internationally. The methods discussed are all standard methods used in SEIA, which have been written about extensively elsewhere. As a result, each method is outlined but not detailed in-depth due to the ease of accessing methodological information elsewhere.

The toolkit represents an initial guide to 'best bet' methods likely to provide useful information in a cost-effective manner to support subsequent decision making processes related to proposed MPAs. It will be updated and expanded to reflect information gained through undertaking assessments on proposed MPAs and elsewhere.

1. What is socio-economic impact assessment?

Socio-economic impact assessment (SEIA) is a useful tool to help understand the potential range of impacts of a proposed change, and the likely responses of those impacted if the change occurs. It can be used to assess impacts of a wide range of types of change, from a proposal to build a new freeway to a proposal to change access to a natural resource such as a forest or the ocean. This understanding can help design impact mitigation strategies to minimise negative and maximise positive impacts of any change.

It is important to determine not only the full range of impacts, such as changes to levels of income and employment, access to services, quality of life, but also the implications of each particular change. Impacts of a certain proposal or policy are also distinct from, though influenced by, other activities which may be occurring. It is important therefore to identify the key source of impact and to separately identify impacts arising from other sources.

While social impact assessment and economic impact assessment are often undertaken separately and employ specific methods, they are complementary and sometimes overlap. For example, both types of assessment may examine demographic change; however an economic assessment may place emphasis on workforce information while a social assessment may also be interested in population change or youth migration. An integrated approach can provide a comprehensive and cost effective outcome, providing information on potential economic impacts as well as important social values attached to the activity which inform likely attitudes and responses to the proposed change. The toolkit emphasises the importance of both qualitative and quantitative data, however recognises the difficulty in data collection which can comprehensively cover the relevant issues.

Section 1 of the toolkit discusses the range of methods used to undertake SEIA within a fisheries or MPA context. Subsequent sections focus on particular tools and information sources relevant to commercial fishers, recreational fishers and fishing-associated businesses and communities.

A wide range of methods are used in SEIA, with their selection and application typically tailored to meet particular requirements. While the specific methods used in each SEIA may vary, they generally involve some or all of the following steps (Taylor, Bryan and Goodrick 1990):

- **scoping** the nature and boundaries of the impact assessment
- **profiling current impacts** of the activity being examined, including the historical context or current status to establish a baseline level and rate of change for relevant variables related to the activity of interest
- **formulating alternatives**, in which alternative ‘impact’ scenarios are developed
- **projecting and estimating effects** of different impact scenarios
- **monitoring** actual impacts
- **mitigation and management** of impacts
- **evaluation** of the impact assessment process.

The toolkit concentrates on the **scoping**, the **profiling current impacts** (often referred to as establishing a 'baseline' rate of change), and the **projecting and estimating impacts** phases. It does not cover formulating alternative impact scenarios as these will likely have been developed prior to the impact assessment. The monitoring, mitigation and management, and evaluation of impacts phases are also not discussed explicitly in the toolkit, but data gathered using the methods discussed here would provide a suitable basis for subsequently monitoring, mitigating and managing impacts of MPAs.

The following sections provide a guide to:

- scoping an impact assessment
- profiling the current context and identifying who is likely to be impacted
- assessing direct socio-economic impacts
- assessing indirect socio-economic impacts.

Figure 1 outlines a general flow chart to identify how these four phases of SEIA fit together in assessing impacts of the introduction of MPAs. Not all phases would necessarily be covered in each assessment. The actual methods employed for undertaking assessments would vary on a case-by-case basis from area to area. Factors which would determine the type of assessment to be undertaken include:

- likely level of perceived impact on fishing activities and community concern
- value of the fishing affected
- numbers of fishers potentially affected
- level of community dependence on the resource
- level of individuals' dependence on the resource
- availability of suitable existing data.

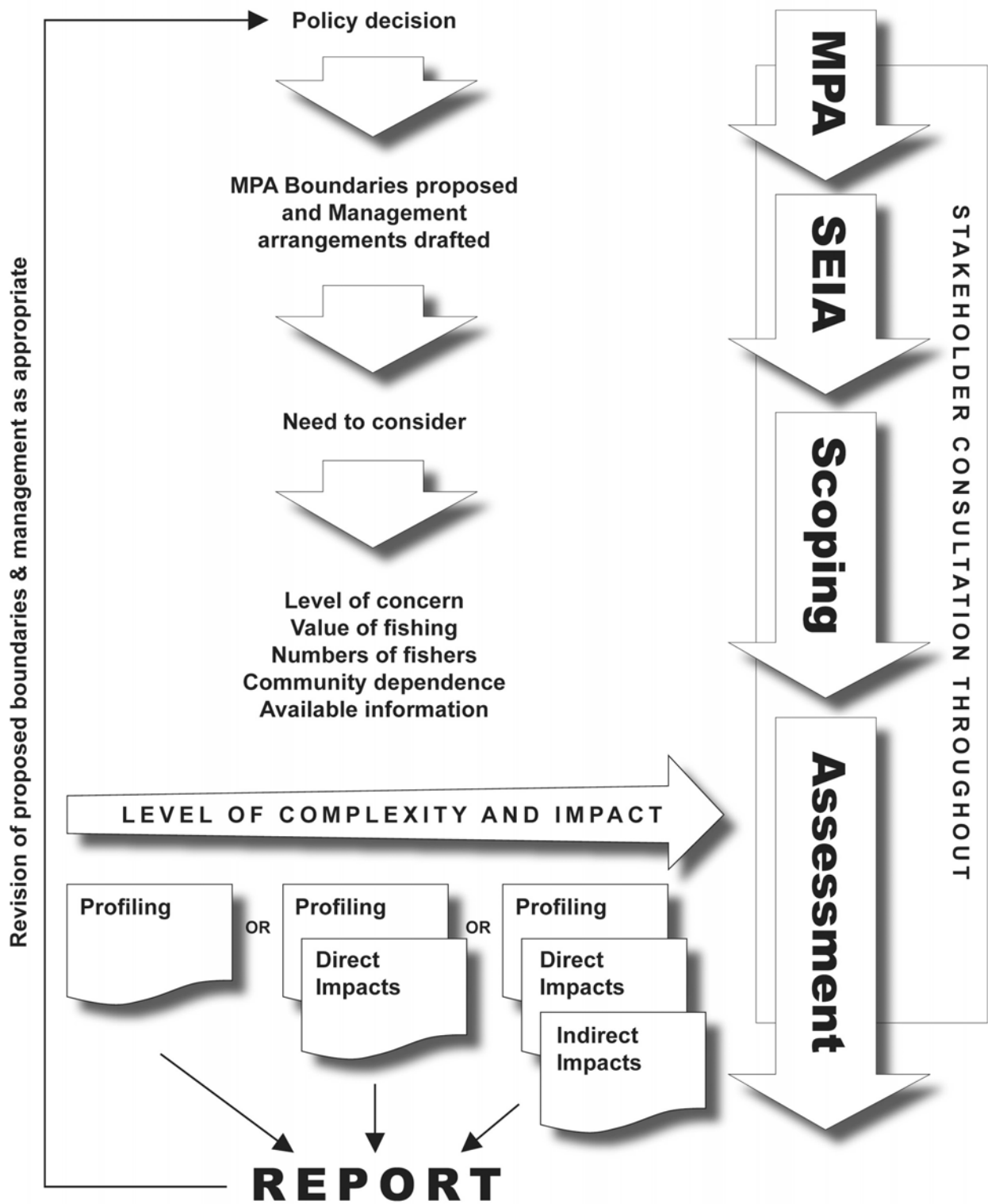


Figure 1: Socio-economic assessment for proposed Marine Protected Areas

1. Scoping

The ‘scoping’ phase establishes the goals and boundaries of the assessment and focuses the SEIA on key impacts. While the extent of the scoping phase may vary for different projects, scoping should aim to determine the:

- time and resources available for the SEIA
- nature of the proposal being assessed
- groups who are potentially impacted
- key impacts of interest
- extent of available information, its potential usefulness in terms of appropriate scale, timeframe, content etc and how data gaps can be addressed
- process and methods to be used for the SEIA.

Information obtained at the scoping stage will help determine what approach to use in the assessment. Factors such as the nature of the proposal, the level of perceived concern and the extent of available and appropriate existing data will guide decisions about the complexity and detail of the SEIA.

The scoping stage also considers the level of community participation or involvement in the SEIA. The term ‘community’ here refers to both place-based communities, which can be defined geographically, and interest-based communities defined by a common interest or activity, often referred to as a ‘stakeholder’ group. The scoping phase identifies and examines the types of communities and/ or number of individuals potentially impacted and their level and type of participation in the SEIA.

In practice, SEIAs range from ‘technical’ style assessments in which community involvement does not occur, through to fully participatory approaches in which information gathering occurs in partnership with the potentially impacted community. Community participation can assist in identifying the issues of real concern to potentially impacted communities, to enable more detailed information gathering and more meaningful analysis targeted to these key concerns, with outcomes more likely to be accepted and supported by these communities. Participatory approaches recognise a range of perspectives about the nature of impacts of particular activities, and allow these to be expressed and recorded as part of the assessment. A participatory approach also enables dialogue and conflict resolution processes on controversial issues related to the SEIA to be built into the process.

Scoping for community involvement can occur in a number of ways:

- (1) **Existing consultation processes** can be used as part of the SEIA process.

The advantages of using an existing process are that:

- key impacts of interest may already have been identified
- the consultation group can feed into a consultative committee to advise on the SEIA
- information already obtained can assist in determining the best processes for the SEIA
- information from the SEIA can input into the consultative process.

- (2) **A rapid assessment** where timeframes or other constraints restrict the level and scope of possible consultation.

Rapid assessment can provide basic information on the likely scope and nature of impacts, providing a useful guide to those who are considering different proposals. By their nature, rapid assessments are undertaken quickly, often in only 4 to 6 weeks, with limited ability to include consultation with affected communities. With rapid assessment a key aspect of scoping is:

- identifying the types of impact that can be assessed within the ‘rapid’ timeframe provided
- ensuring key stakeholders who have developed the proposal are aware of the scope and limitations of what can be achieved in a rapid assessment.

Rapid assessment generally involves limited consultation, but draws on those who developed the proposal to identify what impacts can be assessed in the short time frame. Other forms of limited consultation such as focus groups involving key stakeholders can be used to provide information on key impacts and concerns. Rapid assessments can form the basis of subsequent in-depth impact assessment and provide useful information to input into the scoping process of a longer impact assessment process that involves direct consultation with stakeholder groups.

- (3) **Establishing ongoing consultation.**

Where an in-depth impact assessment is proposed, and existing consultative processes cannot be tapped into, the scoping process should ideally establish a consultative committee of key stakeholders to advise on the project, and a plan for ongoing consultation with potentially impacted groups and communities. In this case, the scoping process will involve:

- identifying key stakeholder groups and holding discussions with each to determine the key impacts and issues of interest; and
- setting up a consultative committee to advise on the SEIA and developing a plan for ongoing consultation with potentially impacted groups and communities.

2. Baseline profiling and identifying who will be impacted

Before the nature of socio-economic impacts from any proposed change can be identified it is necessary to understand the current impacts or effects of the activity being examined, including the historical context and current status of operations, and to identify the groups and communities associated with the activity. Both qualitative and quantitative information are important to obtaining a thorough baseline profile. Some of these aspects may already have been gathered as part of the scoping phase.

The following information may be identified in a baseline profile:

- types of activities which may be affected, who undertakes these activities, when and where
- extent/scale of activity potentially affected and the range of values associated with these activities
- historical, regulatory and other factors impacting on these activities
- methods of contacting people who may be affected so they can provide data about potential impacts
- geographic location of members of groups who may potentially be impacted by the proposed change
- proportion of the group, or of their activity, likely to be affected.

The total effect of any activity comprises both its initial or direct effects and the resultant indirect or flow-on effects generated by it. For example, fishing activity has a range of effects or impacts on those individuals and firms directly engaged, such as providing income and employment, and it also results in flow-on community, regional and broader effects. Likewise, the impact of changes to restrict resource access will be felt directly by those engaged in the fishing industry and will also be felt indirectly by associated communities and firms.

A range of methods can be used to identify those who may be directly and indirectly impacted by a proposed change.

In identifying groups impacted by changes to resource access, it is important to examine the linkages between the resource activity and the communities and businesses that support and depend on them. In the case of marine resources, these social and economic linkages, and hence potential impacts, may not be restricted to adjacent land-based communities. Methods specific to identifying potentially affected commercial fishers, recreational fishers and fishing-associated businesses and communities are discussed in the following chapters.

3. Assessing direct impacts

Direct impacts of a change are felt by those individuals, groups and firms directly engaged in the activity being affected. In terms of this toolkit direct impacts has been taken to refer to impacts in relation to the fishing industry, for example on fishers and their families and on fish cooperatives and other directly associated businesses. Types of social and economic direct impacts may include changes to:

- production output
- employment – eg location, availability, and types of employment;
- personal and/or business income
- personal and/or business expenses – eg, changes to the cost of doing business;
- asset values - eg business capital items, housing;
- domestic or household food resources
- working conditions – eg hours worked, health and safety;
- psychological well-being – eg stress levels, happiness, security, family interactions, leisure activities
- social services – eg access to, level of provision
- social well-being – eg attachment to place, access to social networks (often called ‘social capital’).

To assess direct socio-economic impacts, information and data are gathered on:

- those identified as potentially affected by the activity, where possible over a period of time, to establish a baseline level and rate of change in key variables
- the level and nature of potential impacts of the activity on those affected
- the range of potential impacts of the proposed changes.

This can be done using a variety of methods. The most common methods are:

- (1) secondary data analysis,
- (2) primary data collection through surveys, interviews, focus groups etc

(1) Secondary data analysis of existing data sources

Analysis of existing data sources can identify the broad level and/or nature of potential impacts of a proposed change. Time series secondary data, where available, can identify trends in key variables over time and is useful in establishing baseline levels and rates of change occurring outside of the particular impacts being examined.

Advantages and limitations: This approach is very useful where secondary data of an appropriate nature exist. However, secondary data may have been collected for an unrelated purpose and hence not be at a scale suitable to identify specific detailed impacts, or else it may contain biases which would potentially misrepresent impacts if relied on. For example, secondary data on fishing employment collected outside of a fishing season may underestimate the true level of employment. ABS Census data may not contain information directly applicable or relevant to the impacts being assessed due to the type of information collected. Privacy considerations can also impact on data access.

Time required & costs involved: The time and cost involved in accessing and analysing secondary data depends on the amount and type of secondary data, and the extent of data manipulation and analysis required to the data sets. Procedures and requirements (including pricing policies) for accessing secondary data holdings vary among organisations.

(2) Primary data collection such as surveys and focus groups

Directly gathering data from an identified sample of a population allows questions to be targeted to relevant issues, such as the nature and extent of specific types of social or economic impacts. This allows a much wider and more detailed range of information to be examined than from secondary data.

Surveys, for example using percentage of identified recreational fishers fishing in a particular region, include face-to-face, mail or phone surveys or interviews approaches, with the selection of survey instrument dependent on the method most appropriate to the data required.

Both qualitative and quantitative information and data can be collected. The key difference between quantitative and qualitative methods is the types of data they can gather. Surveys with a more qualitative focus generally seek to obtain more descriptive information through a less structured approach, including the use of open-ended questions. This allows a much broader range of detail to be gathered than surveys where more structured questions are framed to allow numerical coding and description of responses. Quantitative surveys provide descriptive and analytical statistics to provide general background context and describe a particular situation, but usually little explanation of why the situation has occurred. Qualitative survey results identify key themes among the issues of concern, some of which are able to be quantified.

Advantages and limitations: Qualitative methods produce detailed, in-depth information that can draw out more meaning on complex issues and potential explanations about particular variables or outcomes of interest. For an example of qualitative and quantitative approaches in an Australian fishery context see Bradshaw, 2001. These methods allow stakeholders to raise their own issues and categories rather than these being predetermined by the researcher. Quantitative methods allow measurement of larger and possibly representative samples, simplifying comparison and aggregation of data. They can provide broad, potentially statistically generalisable sets of findings, depending on how the sample of respondents is selected. Sound quantitative surveys are typically based on initial qualitative research which has been used to identify and target key issues and topics.

Time required and likely cost: All types of survey can be time consuming and expensive. The actual cost and expense are dependent on the size of the sample population, the level of survey coverage and survey methods used.

Focus groups are a data gathering technique involving organised group discussions with selected individuals (usually six to 10) to gain information on their views and experiences of a particular topic.

Focus groups rely on interaction within the group based on topics supplied by the researcher. The main purpose of focus group research is to draw upon respondents' attitudes, feelings, beliefs, experiences and reactions in a way which would not be feasible using other methods, for example one-to-one interviewing or questionnaire surveys. Focus groups provide multiple views within a group context and can be

particularly useful in exploring the degree of consensus on a given topic or option. Focus groups can be used at various stages in the research process (for example, to develop questions or concepts for questionnaires or interviews), and can be used either as a method in their own right or as a complement to other methods, especially for triangulation and validity checking.

Advantages and limitations: They are particularly suited for obtaining several perspectives about the same topic and allow related but unanticipated topics to be explored as they arise in the discussion. They can be useful to identify themes and refine questions. Focus groups provide information on why an issue is important, as well as what is important about it. However, by their nature focus group research is open-ended and cannot be entirely pre-determined. The findings are limited in their generalisability to a whole population, mainly because of the small numbers of people participating and the likelihood that the participants will not be a representative sample. Likewise responses from a number of groups are not compared in a strict quantitative sense. Identifying the most appropriate participants for a focus group and recruiting participants can be time consuming. Where people with specific interests are sought, recruitment can be best done through word of mouth, key informants, existing social/industry networks or a social mapping exercise.

Time required and likely cost: Focus groups can gather a wide range of information in a relatively short space of time. Costs can include payment/incentives relating to participants' attendance, recruitment processes, venue hire and facilitation.

4. Assessing flow-on impacts

The indirect or flow-on impacts of a change are generated at a broader level as a result of the impacts felt by those individuals, groups and firms directly associated with the change. Sometimes it can be difficult to distinguish 'direct' from 'indirect' impacts, with some arguing for a continuum of more and less direct impacts rather than two categories. Impacts generally defined as indirect include:

- impacts on economic activity in a region as a result of changes to consumption and production spending/activity
- changes to employment and income in a region
- changes to population in a region including age, employment, length of residence and other demographic characteristics
- changes to levels of service provision and social capital in a community/region.

In this toolkit indirect impacts have been taken to refer to impacts on communities associated with the fishing industry and firms that receive income from the sale of goods and services to the fishing industry. Indirect impacts may include any direct impacts mentioned earlier, such as employment, personal and business income and expenses, asset values, etc. Indirect impacts may be measured using:

- (1) regional profiling
- (2) surveys
- (3) modelling approaches.

(1) Regional profiling

Regional profiling involves identifying the geographic communities likely to be impacted by the proposed change, and gathering secondary social and economic data about those communities. This provides a profile of relevant characteristics of the region/communities defined as potentially affected. Where secondary data for key variables are available as a time series, they can be used to suggest the counterfactual case, ie what would happen in the absence of the change, or whether any long-term trends may be magnified or constrained by the change.

Data collection method: Regional profiling uses available secondary data from a variety of government, industry and community sources. As well as descriptive and statistical social and economic information, environmental information may also be included for a comprehensive understanding of the region. Consider the ABS website (<http://www.abs.gov.au>) under Themes – Regional for more detailed information about statistics on a small area basis. Data should generally be collected down to the smallest spatial unit relevant for the study, which will depend on the nature of affected communities and the mode of analysis – typical small area data collection units include Census Collection District (CD), Local Government Area (LGA), Statistical Local Area (SLA) and Postcode (for more information about the geographic size of these different units, see the Australian Bureau of Statistics website at www.abs.gov.au).

Information typically gathered as part of a regional profile includes the following.

- population
- labour force
- education, skills and training

- industry structure and firm performance
- measures of social capital and social well-being.

Detail of possible measures and sources of different secondary data is set out in Appendix 1.

Advantages and limitations of regional profiling: Regional profile data identifies specific local conditions that may be influenced by the introduction of particular changes and their broad levels of significance. Regional profiling relies on availability of appropriate secondary data. This is often quite limited in scope, and may not provide the level of detail or type of information required to assess impacts. In some cases proxy indicators have been developed to assist in addressing data issues.

When regional profiling is supported by survey and other detailed information-gathering in the affected communities, there is a better understanding of possible community-wide impacts and dependence of communities on the changes being assessed.

Time required and likely cost: Depends on number of variables analysed and cost of access to data; usually low to medium.

(2) Surveys and focus groups

Qualitative or quantitative information collected via surveys and/or focus groups is useful to identify:

- the regional communities in which fishers live and undertake social and economic activities, which can support regional profiling
- the nature and scope of economic and social activities of those directly impacted in associated communities, allowing a detailed analysis of flow-on social impact and sometimes economic impact, although this approach may not allow impact as a proportion of total regional activity to be identified
- key changes occurring in relevant communities which may make them more or less vulnerable to changes due to altered access to and/or use of marine areas.

(3) Modelling approaches

Various modelling approaches attempt to understand the industry linkages within a region, to identify the economic impacts of a proposal not only in terms of the initial impact to a particular industry but also connected industries. For any external shock to a regional economy, there are a number of effects beyond the initial effect – eg, reduction in local area fishing may mean less income for boat repair or fuel supply firms, with possible further negative impacts on local economic activity.

The total economic impact of the introduction of a proposed change is the sum of direct effects and the flow-on effects to other sectors of the regional economy. Flow-on effects can be divided into two components:

- indirect (production) effects, resulting from re-spending by firms that receive income from the sale of goods and services to firms undertaking the primary activity
- induced (consumption) effects, resulting from re-spending by households that receive income from employment in the primary and indirect activities.

The flow-on effects from the initial impact can be quantified by deriving multipliers – which identify inter-industry relationships and show how the shock ripples through the rest of the regional economy. Flow-on

impacts will vary across regions given the nature of the local economy – eg. the level of industrial/economic diversification, existence of downstream activities, linkages to the national or international economy. Three more complex methods for assessing economic impact are:

- (1) regional input-output analysis
- (2) integrated modelling
- (3) computable general equilibrium modelling.

Input-output analysis is the most commonly used technique in Australia of estimating economic impact through considering direct and flow-on effects. The other two methods are very sophisticated and require significant economic expertise to construct and use – they are briefly described to indicate the future potential of assessing the economic impact of MPAs with more detailed and flexible models.

(1) Regional input-output (I-O) analysis is based on a set of tables that quantify the linkages and transactions between different sectors of the regional economy and used to prepare multipliers for measures of impact including both indirect and induced effects. Typical economic impact measures in input-output include:

- output (sales/gross revenue)
- value added (the payments to local primary inputs of production)
- household income (wages and salaries, earnings or income)
- employment (number of persons employed).

Data Collection Method: The direct effect of a proposed MPA should generally be measured through surveying and interviews, combined with secondary data such as fisheries licence data. If secondary data for flow-on effects is not available (common for very small areas), surveys of input suppliers can provide estimates, but this is resource intensive and does not capture all successive rounds of re-spending.

Ideally, multipliers should be calculated from input-output tables for the relevant region. Regional economies generally have a higher degree of specialisation, and rely more heavily on external suppliers in most industries, than national economies. As such, regional multipliers are often lower than national multipliers. However, in most cases regional input-output tables are not readily available, and must be developed for specific economic impact studies (rather than using less appropriate state or national tables). If available, extant tables from earlier studies of the region can be a quick and inexpensive short-cut, however elements of the table may change over time (particularly in smaller regions or regions with dominating firms) which could lead to significant inaccuracy if not updated with more recent data.

Flow-on effects of an activity can be estimated using industry-wide multipliers or multipliers prepared for similar industries, however, the preferred and most rigorous approach in practice is to calculate multipliers using input-output tables that incorporate a specific row and column for the activity being analysed – eg. fishing. Estimation of the specific row and column requires detailed information of income and expenditure patterns. This information is usually collected through a survey of firms undertaking the activity, supplemented with additional data.

Prerequisite information: Input-output analysis is a detailed technical task that requires specialist economists to rigorously construct and interpret.

Limitations and Assumptions: Like all economic models, the various assumptions in I-O analysis are important factors in interpreting the quantitative results. It is a static analysis that does not create price responses to changes in quantity. There is an assumed homogeneous input structure for each defined industry, with constant returns to scale and fixed input proportions. There are no external economies or

diseconomies, changes in technology, or supply-side constraints such as labour shortages. Therefore, I-O analysis only predicts impacts in terms of the existing situation in the region – it does not account for potential changes in behaviour by economic agents. It should therefore be combined with qualitative fieldwork to understand potential reactions to the change.

Time Required/ Likely Cost: Medium; varies based on whether extant input-output tables exist.

(2) **Integrated modelling** combines input-output and econometric techniques, and has been particularly used to analyse activities such as tourism and the environment. These models retain the detailed sectoral disaggregation of the input-output system, and are closed using a system of endogenous non-linear econometric relationships. This closure captures the response through time as the economy is subjected to shocks.

Limitations and Assumptions: Construction of an integrated model requires substantial data, resources and expertise, which significantly exceed those of input-output modelling and, in the Australian context, are probably limited to a small number of academics. Integrated models are not restricted by assumptions of constant returns to scale and fixed input proportions such as in I-O analysis. They can capture marginal changes over time resulting from price changes, technological progress and changing returns to scale.

Time Required and Likely Cost: Medium timeframe; varies based on whether extant input-output tables exist. Costs - medium-high.

(3) **Computable General Equilibrium (CGE) models** are models of the entire economy of a nation or region, taking into account all sectors. They can model a broader range of economic variables than I-O analysis, and incorporate dynamic responses such as factor substitution and changes in relative prices. CGE models are incredibly complex, data-intensive and require substantial resources and expertise – not only for their development but also for analysis.

Only very recently have Australian models been developed that consider sub-national or sub-state regions. Models developed by the Centre of Policy Studies (CoPS) at Monash University have been limited in their regional applications, particularly for region-specific shocks. However, there is significant development in CGE models for smaller regional aggregations. The new TERM (The Enormous Regional Model) model allows consideration of 57 regional economies in Australia, defined by (ABS) statistical divisions, and 144 industry sectors. To get to this level of regional detail, various assumptions (such as concerning the composition of investment and government demand) are made, which limit the model's accuracy – however this model is the best CGE model for analysis if supply-side shocks will differ between regions with a State.

Limitations and Assumptions: It has been suggested that, due to the relative openness of regional economies, it is less likely that the conditions of (local) general equilibrium will hold. Whilst not currently likely to be the best model for understanding the economic impact of MPAs, future developments in regional CGE models may increase usefulness.

2. Commercial fishing

The commercial sector of the fishing industry includes wild-catch, aquaculture, processing, storing, transporting, marketing and selling activities. The sector supports many people's livelihoods and lifestyles. The sector is diverse and comprises many types of fishing methods and species. This chapter details specific methods for:

1. Scoping an assessment examining impacts on the commercial fishing sector of a proposal to declare or change an MPA
2. Profiling current commercial fishing operations and identifying commercial fishers, fishing families, and related businesses that may be impacted
3. Assessing direct socio-economic impacts of a proposal on commercial fishing.

Assessing flow-on impacts on associated businesses and communities is discussed in Chapter 4.

1. Scoping

Fishing and related activities may be impacted by MPAs in very different ways, depending on:

- the geographic area covered by the MPA
- the nature and intensity of fishing and fishing related activities in that region
- the kind of fishing activities that are restricted in a particular MPA.

Generally, previous studies and consultation with fishing industry stakeholders (see Appendix 2), suggest MPAs may reduce the level of fishing activity within its boundaries, with resultant possible changes in:

- levels of income;
- type and level of employment;
- mental and physical well being;
- operating costs;
- business value;
- service provision; and
- community well-being.

These changes can/may impact on fishers, their families, fish receivers and downstream processors, suppliers of fishers and fish receivers, and/or fishing-associated communities.

The scoping phase examines the available information on the MPA proposal, the key impacts anticipated and the key groups potentially affected, as well as the extent of available appropriate information for undertaking the assessment. Information obtained at this phase is also then used to inform decisions about the appropriate approach to undertaking the SEIA, including the available resources and timeframe and the level of information able to be accessed from various phases of the SEIA process.

2. Baseline profiling and identifying who will be impacted

This phase gathers information on:

- current impacts of commercial fishing within the area
- historical context of the fishery including current management arrangements
- current status of operations
- who may be impacted by the proposed MPA.

Sources of information on baseline conditions (i.e., current impacts, historical context and current status) may include previous studies undertaken or information contained in industry-related journals or publications. Other relevant sources are regular *Fisheries Status reports* by Bureau of Rural Sciences (BRS) and *Fisheries Surveys* by Australian Bureau of Agriculture and Resource Economics (ABARE).

To identify all groups likely to be affected, the first step is to identify potentially impacted commercial fishers, and from there to assess potentially impacted fishing families, fishing associated businesses, and subsequently fishing associated communities (discussed in Chapter 4). The approach taken depends on the level of available data and the extent and complexity of the assessment being undertaken. For example, where available data is at a scale similar to the proposed MPA and has an appropriate level of confidence, sufficient information may be available from secondary data to provide a broad assessment of impacts.

Commercial fishers

There are a range of methods available to identify commercial fishers who may be impacted by fishing restrictions imposed by the proposed MPA. Table 2 summarises the data issues associated with each:

- (1) fisheries licence data
- (2) catch data
- (3) survey of licence holders.

(1) Fisheries licence data

Fisheries licence data is useful in estimating the total population of fishers in a region/fishery potentially affected by a proposed MPA, and may be able to be used to identify individual fishers potentially affected. This is a starting point for further work (eg surveys) to identify what proportion of this overall group may be impacted and the nature of potential impacts, accessing catch data to provide more detailed information on potentially impacted fishers, and identifying other groups likely to be impacted. Where addresses of fishers can be accessed, contact can be made to collect primary data, eg via a survey.

(2) Catch data

Catch data collected by State or Australian Government fisheries agencies provides the total volume of catch recorded as coming from an area within which the proposed MPA sits. Where this data is available to the required level of detail, it is possible to determine (a) which licence holders are likely to be affected, and (b) the proportion of catch volume from different fisheries likely to be affected by the proposal. From this the proportion of overall fishing activity potentially affected can be estimated. This estimate can be compared with fisher's estimates of potentially affected catch.

(3) Survey of licence holders

Where the numbers of fishers operating in the vicinity of a proposed MPA are small and catch data does not assist in identifying proportion of catch affected (eg collection is at too coarse a level of detail), a survey can identify the proportion of catch occurring in the area of the proposed MPA. Data obtained from the survey can be used to interpret and adjust catch data provided from fisheries agencies. A survey of license holders can also be used to identify other fishers potentially affected such as employees.

	Fisheries licence data	Catch volume data	Survey of licence holders
Data collection method	<p>Secondary data analysis</p> <p>Liaison with State/Cwlth licensing agencies re level of information held and able to be accessed</p>	<p>Secondary data analysis</p> <p>Liaison with State/Cwlth data collection agencies to identify the nature & scale of data holdings and how it relates spatially to the proposed MPA area.</p>	<p>Primary data collection/ analysis</p> <p>Methods used depend on the type/ level of information sought and size of population eg face-to-face (individually or in groups), phone, mail.</p>
Prerequisite information	Proposed zoning and management arrangements to identify subset of license data	Proposed zoning and management arrangements to identify subset of catch data	Licence data or data from a consultation process identifying fishers who may have part/all of their catch affected by the proposed MPA
Advantages	<p>Identifies numbers of fishers with licence to operate within an area covered by proposed MPA</p> <p>Provides contact details and place of residence (homeport) in some instances</p> <p>Can also provide details by licence type</p> <p>Enables more detailed primary data collection from this group eg survey, interview.</p>	<p>Identifies total volume of catch recorded from an area covered by proposed MPA</p> <p>Identifies port of landing for catch (where data available)</p> <p>Identifies proportion of catch affected and whether the impacts are across all licence-holders or only some.</p> <p>Enables more detailed primary data collection from this group eg survey, interview.</p>	<p>Builds on fishing licence and catch data to identify those actually currently operating within the proposed MPA area</p> <p>Provides detail of other potentially affected fishers eg employees, business partners</p> <p>Provides detail at scale not obtainable from secondary sources, especially on proportion of catch affected.</p> <p>Face to face data collection often encourages higher participation rates. Phone and mail surveys are useful for larger numbers</p>

Table 2: Approaches to identifying affected commercial fishers

(cont)	Fisheries licence data	Catch volume data	Survey of licence holders
Limitations	<p>Direct usefulness of data dependent on the match between the MPA area and the data collection grid eg data may not be detailed enough to identify proportion of fishers affected</p> <p>Does not identify all affected fishers, eg employees, business partners</p> <p>Level of detail may vary across agencies covering the one proposed MPA.</p> <p>Accessibility of data may vary depending on the agency and privacy provisions in place</p>	<p>Direct usefulness of data dependent on the match between the MPA area and the data collection grid eg proposed MPA may be smaller in size than the smallest data collection grid, or MPA boundaries may cross through parts of several data grids</p> <p>Level of detail may vary across agencies covering the one proposed MPA.</p> <p>Accessibility of data may vary depending on the agency and privacy provisions in place</p>	<p>Relies on accurate reporting of affected catch by those consulted, which may be difficult where MPA areas are a small part of the total area fished.</p> <p>Self-reporting is used in combination with data from secondary data sources</p> <p>Face-to-face surveys only feasible where numbers of licence holders are fairly low.</p>
Time required	Depends on ease of access to licence data. Can be up to 6 weeks for large data sets	Depends on ease of access to licence data	<p>Depends on number of licence holders, the difficulty contacting them and approach applied</p> <p>Larger scale surveys are time consuming</p>
Likely cost	Low	Low	<p>Medium, requires travel to area to conduct consultation</p> <p>Larger scale surveys can be costly</p>

Table 2 (cont): Approaches to identifying affected commercial fishers

Employees, fishing business partners and fishing families

The fisheries licence and catch data discussed above focuses on identifying licence holders who may be impacted. Surveys of licenced fishers (outlined above) can be used to identify others directly involved in fishing operations.

To comprehensively identify potentially impacted fishing families, it is necessary to also identify any employees or business partners of licence holders. This can be done through surveys.

Fishing related businesses

These can be identified through an approach based on (i) linking fishing activity to home ports and port of landing via existing fisheries data, or through (ii) a survey approach. Table 3 summarises data issues associated with these approaches.

(i) Port of landing and homeport data, ie, information on locations of homeports (where fishers may purchase supplies etc) and port of landing (from which fish is transported to be processed/sold) is used to identify geographic locations of fishing related businesses which may be affected by the MPA. Local directories are then used to identify potentially affected businesses.

(ii) Surveys of fishers (licence holders and employees) can be used to examine likely effects on fishing associated businesses, such as where affected fishers purchase supplies, service gear, and where their landed catch is sold. This allows those businesses to be identified which are likely to be affected by changes to levels of fishing, and the level of impact in terms of value.

	<u>Homeport/Port of landing data</u>	<u>Survey data</u>
Data collection method	Secondary data analysis. Uses data held by fisheries agencies on homeport and landed catch at particular ports, and local directories to identify potentially affected businesses.	Primary data collection via survey to obtain quantitative data.
Prerequisite information	Information on commercial fishers affected, so that their catch data can be used to identify homeport and/or port of landing.	Identification of affected fishers.
Advantages	Rapid method of identifying likely affected businesses	Detailed information gathered on economic flows. Can be combined with surveying on social and economic impacts of proposed changes, and used to estimate direct economic impact on businesses as well as identify them.
Limitations	Homeport and port of landing data not always available, or available at the level of detail required. Assumes that businesses located in close proximity to homeports or ports of landing are most likely to be impacted, which may not always hold true. Does not identify the full chain of businesses affected.	High cost and time involved
Time required and Cost	Low	High

Table 3: Approaches to identifying fishing-related businesses

3. Assessing direct impacts on commercial fishing

Direct social and economic impacts on commercial fishing can be identified using:

- (1) Catch and catch value data
- (2) various forms of survey;

Very little secondary data is available to assist in identifying direct impacts, except in a limited number of cases where previous detailed surveys of particular fisheries have identified some data useful for assessing potential impacts. Elsewhere, catch value and volume data is the major source of secondary data, along with fisheries status and baseline information. Where catch data is sufficiently specific in linking catch to the geographic area covered by the proposed MPA, it can be used to determine the overall level of direct economic impact. Otherwise, primary data collection using methods such as interviews and surveys, may be necessary to obtain this information.

While impacts of displaced fishing are covered in the section on indirect impacts, their relevance in examining impacts on fishers suggests that they need also to be considered at this point.

(1) Catch and value data

Catch data collected by State or Commonwealth fisheries agencies is used to identify the reported volume of catch landed from the area affected by the proposed MPA, and this is combined with catch value data to give an estimate of the value of the catch affected. This also relies on accessing appropriate catch value data for the region being studied. Current sources of catch value data include ABARE's fisheries surveys and statistics (information on these is available at http://www.abare.gov.au/data_services/fish.html).

Data collection method: Secondary data analysis, using catch quantity and value data by geographic region. Liaison with data collection agencies to identify what type of data on catch volume is held, and whether it is held at a level of detail appropriate to the boundaries and scale of the proposed MPA.

Prerequisite information: The geographic area of the proposed MPA and types of fishing affected by the proposal.

Advantages: Where data is available, a quick and simple way of identifying proportion of catch likely to be affected.

Limitations: Only useful where the data held on catch volume is held at a level of detail that correlates usefully to the size of the MPA. Where the proposed MPA is much smaller than the size of the areas for which catch volume data is held, this will not be a useful approach. Catch value data may not reflect true value of catch, due to differences in prices received in different markets, and may be difficult to verify.

Time required and likely cost: Depends on ease of access to data; cost generally low.

(2) Interviews

Where numbers of fishers operating in the vicinity of a proposed MPA are small, and secondary data on catch volume does not assist in identifying proportion of catch affected, face to face interviews can be used to identify the proportion of fisher's catch occurring in the area of the proposed MPA, and potential social and economic impacts of the proposed MPA.

Data collection method: Qualitative survey, using face-to-face consultation with fishers operating in the area of the proposed MPA.

Prerequisite information: Licence data identifying individual fishers who may have part/all of their catch affected by the proposed MPA, eg licence data relating to the broad area surrounding the MPA.

Advantages: Unlike the two methods discussed above, allows more detailed information about social and economic impacts to be gathered. For example, this approach allows researchers to identify whether most fishers have a proportion of catch affected, or if a few fishers have the majority of their catch affected. Can gather a wide range of data in a single interview.

Limitations: Relies on accurate reporting of potential impacts by those consulted.

Time required and likely cost: Depends on numbers of fishers; cost medium, requires travel to area.

(3) Survey of fishers

Where numbers of potentially affected fishers are larger, surveys of fishers (identified using one of the methods discussed earlier) can be undertaken. Information can be obtained on things such as where supplies are purchased, gear serviced, catch sold, and on family social and spending activities eg education, shopping as well as other social impacts of the proposed change.

Data collection method: Quantitative survey.

Prerequisite information: Identification of affected fishers.

Advantages: Detailed information gathered on economic flows and social activities, and potential impacts.

Limitations: High cost and time involved.

Time required and likely cost: High

(4) Survey of fishing associated businesses

Interviews/surveys of fishing associated businesses in areas likely to be impacted by proposed MPA can provide information about both economic and social impacts, based on their estimate of how a given reduction in proportion of catch is likely to affect their business.

Data collection method: Qualitative or quantitative survey.

Prerequisite information: Knowledge of where potentially affected fishers land catch and have home ports (discussed above), and proportion of catch likely to be affected.

Advantages: Can gather detailed information and identify downstream businesses likely to be affected.

Limitations: Relies on good initial identification of businesses likely to be affected.

Time required and likely cost: High/ medium to high

3. Recreational fishing

The recreational sector of the fishing industry is a diverse sector comprising a wide range of activities, fishing methods and businesses. The sector is a large business that supports many people’s livelihoods and lifestyles. It includes commercial activity such as charter fishing operations, bait and tackle shops and boat hire businesses, and also provides leisure activity to a large sector of the population and supports a wide range of associated tourism activities.

Where a proposed MPA reduces access for some or all recreational fishing activity, there may be impacts on recreational fishers and on businesses and communities associated with recreational fishing activity.

This chapter details specific methods for:

- (1) Scoping an assessment examining impacts on the recreational fishing sector
- (2) Profiling current recreational fishing operations and identifying recreational fishers, fishing families, and related businesses that may be impacted
- (3) Assessing direct socio-economic impacts of a proposal on recreational fishing.

Table 4 summarises the kind of information that can be provided by using different methods, to help assist selection of the most appropriate group of methods for cost effectively gathering data.

Method	Types of information produced using this method
Secondary data – existing recreational fishing surveys	A range of information, dependent on the types of data gathered in the surveys Some surveys may provide demographic data on fishers, or data on values, attitudes, and/or social and economic activities
Secondary data – fisheries licence data	Where available, identifies number of potentially affected fishers where recreational fishing is licensed and licence data accessible In some cases, contact details for fishers
Local directories	Identify businesses associated with recreational fishing
Consultation with recreational fishing groups, stakeholders and associations	Identifies some potentially affected fishers Identifies some potentially affected fishing related businesses and communities Data on direct and indirect social and economic impacts for members of groups, although not necessarily representative of entire recreational fishing population
Survey of recreational fishers	Identifies potentially affected fishers Identifies potentially affected fishing related businesses and communities Data on direct and indirect social and economic impacts
Survey of associated businesses	Identification of impacts on businesses associated with recreational fishing

Table 4: Data sources for information about recreational fishing

1. Scoping

Similar to commercial fishing, recreational fishing and related activities may be impacted by MPAs in very different ways (see Appendix 2), depending on:

- the geographic area covered by the MPA
- the nature and intensity of recreational fishing and related activities in that region
- the kind of recreational fishing activities that are restricted in a particular MPA.

Changes may impact on recreational fishers, their families, fishing-related businesses and associated communities.

Identifying the range of potential social and economic impacts on the recreational sector can be complex. In addition, impacts may vary depending on the nature of the fishing activity and across the different sections of the recreation fishing industry. Some of the primary impacts within the recreational fishing sector may be in terms of changes to:

- availability of food to supplement the household budget
- level of leisure activity.

Reducing the area available to charter fishing operations may have impacts on affected business operators similar to those already identified for the commercial fishing sector, such as changes to:

- levels of income
- type and level of employment
- mental and physical well being
- operating costs
- business value.

The scoping phase examines the available information on the MPA proposal and potential impacts on the recreational sector and key groups potentially affected. The scoping phases will also examine the extent of available appropriate information for undertaking the assessment.

2. Baseline profiling and identifying who will be impacted

In this phase information is gathered on:

- the current impacts of recreational fishing within the area
- the historical context of recreational fishery, including current arrangements,
- the current status of activities/operations; and
- identifying who may be impacted by the proposed MPA.

Sources of information on baseline conditions (i.e., current impacts, historical context and current status) may include previous studies undertaken or information contained in industry-related journals or publications. Historical records, for example of competition and tournament catch results, may provide relevant time-series information for certain sectors on participation rates, catch per unit effort and details on participants.

A first step in identifying impacts of a proposal on recreational fishing is to identify the recreational fishers who may be impacted. Once the fishers have been identified, this information can be used as a basis for identifying the extent of fishing families, fishing groups, businesses and subsequently communities that are likely to experience flow-on impacts from the changes.

Identifying affected recreational fishers

There are a range of methods available to identify recreational fishers who may be impacted by fishing restrictions imposed by the proposed MPA:

- (1) Existing recreational fishing surveys;
- (2) Fisheries licence data;
- (3) Consultation with recreational fishing groups, industry associations, field/operational officers in government fisheries management agencies and stakeholders;
- (4) Surveys of recreational fishers.

(1) Existing recreational fishing surveys

In some areas, recreational fishing surveys have been undertaken. These may provide an estimate of recreational fishing effort, and sometimes collect other information about recreational fishing activities. These can be reanalysed in some instances to provide information useful to an impact assessment.

Data collection method: Secondary data analysis. Requires liaison with organisations holding survey data to negotiate access.

Prerequisite information: Area covered by the proposed MPA; existing surveys and organisations holding previous survey data.

Advantages: Provides a useful measure of extent of recreational fishing and potentially other variables, depending on what information was gathered in the survey.

Limitations: Usually can identify level of recreational fishing in the general area, but not necessarily detailed enough to indicate how a proposed MPA will affect recreational fishing in the area. Do not identify individuals for further surveying. Data gathered may not be relevant to the proposal, and care needs to be taken when re-analysing data gathered for a purpose other than impact assessment. Access to any previous survey results may be limited depending on confidentiality and other data access considerations.

Time required and likely cost: Low to medium depending on ease of access to survey data.

(2) Recreational fishing licence data

Where available, recreational fishing licence information is accessed to develop an estimate of the proportion of recreational fishers in a region who may fish in the area covered by the proposed MPA.

Data collection method: Secondary data analysis. Requires liaising with relevant State and Commonwealth agencies responsible for fisheries licensing to find out how the data can be accessed, and what level and detail of information about fishers is accessible via licence information.

Prerequisite information: Knowledge of the type of licence data held by the relevant agency, and knowledge of the geographic area and types of fishing affected by the MPA proposal.

Advantages: Simple way of identifying proportion of fishers and catch affected, if licence data detailed enough.

Limitations: Not all recreational fishing is licensed; where licence data exists it may not be detailed enough to be useful.

Time required and likely cost: Depends on ease of access to licence data, cost generally low.

(3) Consultation with recreational fishing groups, industry associations, fisheries management officers and stakeholders

Consultation with recreational fishing groups, industry associations, field/operational officers in government fisheries management agencies and stakeholders can identify the types and extent of recreational fishing activity in the area covered by the proposed MPA. These sources of information can provide valuable data on local activities and issues of concern. A number of industry associations represent the recreational fishing sector (eg State recreational fishing organisations, sport fishing and game fishing organisations, boating and fishing tackle associations).

Data collection method: Qualitative survey/ consultation.

Prerequisite information: Identification of relevant stakeholders with knowledge of recreational fishing in the area covered by the proposed MPA.

Advantages: Can provide rapid information, and a means of contacting recreational fishers for subsequent surveying

Limitations: The type of information obtained may be limited.

Time required and likely cost: Depends on number of stakeholders. Costs low/medium, may require travel to area to conduct consultation.

(4) Survey of recreational fishers

A survey of recreational fishers operating in the area of the proposed MPA can provide information such as numbers operating, catch and method etc. An appropriate time period for the survey would be determined based on knowledge of types and seasons of fishing occurring in the area of the proposed MPA.

Data collection method: Survey choice will depend on time and funds available and type of information required, eg through questionnaires of fishers at jetties/launching ramps, undertaken on the water (using methods similar to those used in many recreational fishing surveys), survey distributed via a recreational

fishing association if one operates in the area of the proposed MPA or sample survey of the region's population (although this may not capture the recreational fishing by visitors to the region).

Prerequisite information: Boundaries of the proposed MPA.

Advantages: Can provide a range of information, up to quite comprehensive information on use of the proposed MPA area and be combined with surveying the social and economic impacts of the proposal.

Limitations: High cost and time involved.

Time required and likely cost: Medium to high time, and high cost.

Identifying impacted fishing related businesses.

In some cases existing recreational fishing surveys may have gathered information on potentially impacted businesses. Alternately, potentially affected recreational fishing businesses can be identified through:

- (1) local directories or industry-associated organisations or groups
- (2) survey of recreational fishers.

(1) Local directories or industry associations

Most recreational fishing businesses advertise in local directories or association journals. Publication searches can identify businesses supplying goods and/or services to recreational fishers. Recreational fishing businesses can also be identified by directly locating businesses in towns closest to the proposal.

Data collection method: Secondary data analysis, using existing directories, or a street search via visiting the area, to identify businesses providing goods or services to recreational fishers.

Prerequisite information: Area covered by the proposed MPA and adjacent coastal towns/ villages.

Advantages: Rapid method of identifying likely affected businesses

Limitations: Only identifies some businesses; does not identify full chain of businesses affected. Operates on assumption that businesses close to the proposed MPA will be those most impacted.

Time required and Likely cost: Low.

(2) Surveys of fishers

Recreational fisher surveys (as outlined above) can identify businesses likely to be affected by changes to levels of recreational fishing activity and the nature of these impacts.

3. Assessing direct impacts on recreational fishing

A range of methods may be used to identify socio-economic impacts on recreational fishing:

- (1) Existing recreational fishing surveys;
- (2) Surveys of fishers
- (3) Consultation with fisheries management officers; and
- (4) Survey of recreational fishing businesses.

(1) Existing recreational fishing surveys

Limitations: Data may not be relevant to an impact assessment. Care needs to be taken when reanalysing data gathered for an unrelated purpose. Access may be limited due to confidentiality or data considerations.

(2) Surveys of recreational fishers

Recreational fisher surveys can identify the level of recreational fishing activity and potential impacts of changes to recreational fishing from the proposed MPA. This can be combined with gathering other relevant information regarding purchasing and spending patterns and identifying associated businesses.

Data collection method: Qualitative or quantitative survey.

Prerequisite information: Identification of recreational fishers.

Advantages: Detailed information gathered on economic and social activities and potential impacts.

Limitations: High cost and time involved, but depends on the type of approach used.

Time required and likely cost: High.

(3) Consultation with fisheries management officers

Fisheries management field officers and operational staff hold useful local context and information relevant to likely potential impacts. This information can be combined with data obtained from other sources.

(4) Survey of fishing businesses

Consultation/surveys of fishing related businesses in areas likely to be impacted to identify how businesses may be impacted. Requires giving businesses an estimate of impact on recreational fishing activity.

Data collection method: Qualitative or quantitative survey. Interview/survey of fishing related businesses.

Prerequisite information: Knowledge of where those who fish in the area of the proposed MPA land catch and have home ports (discussed above). Knowledge of impacts of proposal on recreational fishing.

Advantages: Can gather detailed social and economic information.

Limitations: Relies on good initial identification of businesses likely to be affected.

Time required and likely cost: High/ medium to high.

4. Fishing and ocean-resource associated communities

Assessing flow-on impacts to communities and firms associated in some way with fishing can be done using the same methods whether the dependency is on commercial fishing, recreational fishing, or both.

In order to analyse flow-on impacts it is necessary to identify the location/s of relevant communities. Associated communities are not always located immediately adjacent to the marine environment covered by an MPA proposal. Likewise, affected fishers may not always reside in the communities potentially most affected.

This chapter details specific methods for:

1. Scoping to identify the location/s of associated communities;
2. Regional profiling, primary surveys and modelling to better understand likely indirect impacts of a proposed MPA on these communities.

Table 5 summarises the information provided by different methods, to help assist selection of the most appropriate group of methods for cost effectively gathering data.

Method	Types of information produced using this method	Other information needed before can use this method
Secondary data – fisheries licence data	Potential geographic location of relevant communities	None
Qualitative or quantitative survey of fishers (commercial and/or recreational) and fishing associated businesses	Identification of location of relevant communities Identification of potential flow-on impacts on relevant communities Data on social and economic impacts of proposed change on fishers etc as identified in Chapters 2 and 3	Identification of fishers and/or fishing associated businesses
Regional profiling	Socio-economic characteristics of geographic regions in which relevant communities are located	Identification of geographic location of fishing and ocean-resource associated communities
Economic modelling	Estimates of flow-on economic impacts of changes to fishing activity on relevant communities	Identification of direct economic impacts eg catch value affected Understanding of quantitative relationships between fishers/fishing sector businesses and the broader community (at defined geographic levels).

Table 5: Data sources for community assessment

1. Scoping

The scoping phase examines available information on potentially impacted fishers and businesses to identify which communities are likely to be impacted by the MPA proposal. Communities affected by a particular MPA proposal may be adjacent to the proposed MPA, where flow-on effects such as reduced income to fishers, co-operatives and fish receivers and a range of other associated businesses operating in the area, may be felt. However, communities not immediately adjacent to the MPA may also experience impacts, depending on where fishers live and where fishing-related income and expenditure takes place.

Potentially affected communities can be identified using a range of sources:

- (1) Fisheries licence, home port and port of landing records;
- (2) Consultation with fishing industry groups and associations, field/operational officers in government fisheries management agencies and stakeholders (useful for areas with small proposed MPAs and few fishers);
- (3) Surveys of recreational fishers.

(1) Fishing licence, home port and port of landing records

Fishing licence data showing where affected fishers have home ports and land catch can be used to identify coastal communities likely to be impacted by the proposed MPA.

Data collection method: Secondary data analysis. Accessing fishing licence data to identify home ports and landed catch records to identify communities likely to be affected by proposed changes.

Prerequisite information: Identification of affected fishers.

Advantages: Rapid

Limitations: Method is based on the assumption that affected communities tend to be clustered around areas where catch is landed and where licence holders register their home ports. This assumption may not hold. Only useful for identifying communities associated with commercial fishing; usually not useful for recreational fishing.

Time required and likely cost: Low.

(2) Consultation with fishing industry groups or associations, fisheries management officers and stakeholders

Consultation with industry groups and associations, field/operational officers in government fisheries management agencies and stakeholders can identify the types and extent of community involvement in fishing activity in the area covered by the proposed MPA. Can be used to ground-truth other data sources.

Data collection method: Qualitative survey/informal consultation.

Prerequisite information: Identification of relevant stakeholders with knowledge of fishing in the area covered by the proposed MPA.

Advantages: Can provide rapid information.

Limitations: Information may be limited.

Time required and likely cost: Depends on number of stakeholders to be consulted. Costs low to medium, may require travel to area to conduct consultation.

(3) Quantitative survey of affected fishers and fishing related businesses

Surveys of affected fishers and/or fishing related businesses can be used to identify where they live and undertake economic and social activities. This allows accurate identification of geographically-based communities that have some level of dependence on fishing activities, and some measure of the extent of that dependence.

Data collection method: Quantitative survey

Prerequisite information: Identification of affected fishers and/or fishing businesses (recreational and/or commercial).

Advantages: Collects most thorough information possible. Can be combined with survey identifying social and economic impacts.

Limitations: High cost and time

Time required and likely cost: High.

(4) Qualitative survey of affected fishers and fishing associated businesses

Focus groups or interviews with affected fishers and fishing associated businesses can provide local knowledge to identifying broader communities affected by changes.

Data collection method: Qualitative survey, using focus groups/interviews with representative fishers and fishing businesses identified as likely to be affected by changes.

Prerequisite information: Identification of affected fishers and/or fishing associated businesses (recreational and/or commercial)

Advantages: Lower cost than quantitative survey

Limitations: Because only a limited number of affected people included, may not identify all communities affected.

Time required and likely cost: Medium.

2. Assessing socio-economic impacts

A range of methods may be used to identify socio-economic impacts on associated communities:

- (1) Regional profiling;
- (2) Economic modelling approaches; and
- (3) Survey of directly affected fishers and fishing businesses.

(1) Regional profiling

Analysis of social and economic indicators of potentially impacted communities/regions, provides a socio-economic profile of these communities/ regions. The types of indicators are summarised in Appendix 1.

Data collection method: Secondary data analysis

Prerequisite information: Knowledge of geographic location of potentially impacted communities

Advantages: Relatively easy to analyse existing data and provide a profile of key socio-economic characteristics. Provides baseline rates of change over time in key variables to allow regions/communities to be identified which may have lessened ability to withstand changes to their socio-economic resource base.

Limitations: Data may not always be available in the detail required for meaningful analysis. Provides only a general or indicative understanding of the baseline economic and social composition of communities, a broad measure of their fishery resource dependency and thus their propensity for impact. Regional profiling should ideally be accompanied by primary data collection that more specifically identifies dependence of communities on key activities affected by proposals, and the nature and scale of that dependence.

Time required: Depends on data accessibility and number of communities examined. Usually low/medium.

Likely cost: Depends on number of indicators measured and cost of accessing data. Usually medium.

(2) Economic modelling approaches

Input-output analysis and other modelling approaches may be used (see Chapter 1). Input-output analysis is the most commonly used approach to predicting indirect economic impacts of proposed changes.

(3) Survey of directly affected fishers and fishing related businesses

Survey of directly affected fishers and businesses to examine the location of their economic and social activities, including spending levels and patterns to assess social and economic dependence on fishing.

Data collection method: Qualitative or quantitative survey

Prerequisite information: Identification of affected fishers and/or fishing businesses.

Advantages: Collects most thorough information possible on nature of activities in communities.

Limitations: High cost/ time. Does not necessarily identify all cross-sectoral social and economic linkages.

Time required and likely cost: High.

Appendix 1: Regional profiling – types and sources of information

Indicators	Sources of secondary (existing) data
<p><u>Population</u></p> <p>sex , age; marital status</p> <p>potential labour force (15 – 65 years)</p> <p>dependency ratios (proportion of working age to total population)</p> <p>ethnic origin, language skills, religion</p>	<p>ABS Census of Population and Housing (eg 1996, 2001) down to Collection District level</p>
<p><u>Labour Force</u></p> <p>employment (changes over time)</p> <p>unemployment rate (over time)</p>	<p>Department of Employment and Workplace Relations (DEWR) <i>Small Area labour market data</i> (by SLA) (http://www.dewr.gov.au)</p>
<p><u>Income</u></p> <p>personal income</p> <p>family/household income</p> <p>average weekly earnings</p>	<p>Bureau of Transport and Regional Economics (BTRE) <i>Personal Taxable Income database</i> (http://www.btre.gov.au, to be published) for SLA 10-year annual series, LGA 2-year annual series.</p> <p>See ATO for more detailed data by postcode.</p> <p>ABS Income data (Census). Every five years (1996, 2001) – classified by age structure etc, available at Collection District level.</p>
<p><u>Education, Skills and Training</u></p>	<p>ABS Census data.</p> <p>BTRE Education, Skills and Training database (http://www.btre.gov.au) by SLA and BTRE labour market regions</p>
<p><u>Industry Structure and Firm Performance</u></p> <p>employment by industry structure</p> <p>number of businesses</p> <p>income</p> <p>selected expenses</p>	<p>BTRE Industry Structure database (http://www.btre.gov.au) for employment for 1991, 1996 and 2001 by industry structure to two-digit ANZSIC classification (eg. ANZSIC subdivision 04 Commercial Fishing) by SLA and BTRE labour market region.</p> <p>See ABS for more detailed ANZSIC classification data.</p> <p>ABS (Cat 5675.0) <i>Experimental Estimates, Regional Small Business Statistics, Australia</i>. Experimental data sets on small business financial performance (no of businesses, income, selected expenses) disaggregated by statistical division (SD) covering 1995-96 to 1999-2000 inclusive.</p> <p>See ATO for more highly disaggregated data</p>
<p><u>Measures of social capital and social well-being</u></p> <p>Common measures include:</p>	<p>Indices of social well-being have been compiled internationally for various purposes. Within Australia, the primary indices of social well-being are the Socio-Economics Indexes for Areas (SEIFA) indexes, produced by the ABS (http://www.abs.gov.au).</p>

<p>(1) <u>individual indicators</u></p> <p>Dependency levels (age/child dependency)</p> <p>Education levels</p> <p>Employment (type/hours/security)</p> <p>Home ownership levels</p> <p>Income measures (household/individual income, average income, income range across population, gap between high and low incomes)</p> <p>Mortgage/rent payments as proportion of total household income</p> <p>Unemployment</p> <p>Youth population –change in proportion of young people as measure of region’s overall attractiveness</p> <p>(2) <u>indices of social capital/ social well-being</u></p> <p>eg SEIFA</p>	<p>In addition to the SEIFA indexes there are other indices produced by different groups which aim to measure levels of confidence in the future and overall psychological well-being. These vary in terms of how often they are measured, whether they have been measured regularly, and the regions covered</p>
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Appendix 2 : Key social and economic impacts identified by the fishing sector

Consultation with the commercial and recreational fishing sector identified a range of impacts potentially occurring if an MPA is declared, in the absence of strategies aimed at mitigating impacts.

Impacts are categorised as ‘direct’ and ‘flow-on’. Direct impacts are defined as those which impact directly on those who are fishing, their families and businesses and firms operating in the fishing industry. Flow-on impacts refer to the ‘flow-on’ impacts resulting from the actions taken by fishing families and these firms and businesses in response to direct impacts. Social and economic impacts have been combined, as they often overlap – for example, employment impacts are often considered to be both ‘social’ and ‘economic’ impacts, and social and economic impacts feed into each other – ie, an economic impact has social consequences, and vice versa. Environmental/biological impacts are not included in the list below, due to the focus of the toolkit on social and economic impacts.

Direct impacts

Earning capacity & costs of fishing businesses

- reduced overall profits (e.g. from reduced fishing area, and increased concentration of fishing effort in remaining areas)
- reduced income for fishing business owners & employees
- decreased value of assets (e.g. too many boats/permits on the market, fewer buyers)
- difficulty accessing finance due to reduced confidence of investors and financial institutions
- less fishing available but license fees remain the same – effectively increasing the cost/ dollar of catch.
- increased management costs for fishing industry associations/representatives (e.g. due to increased lobbying, stakeholder consultation engagement duties)
- cost of purchase of quota/license to access alternative fisheries

Fishers and their families

- reduced employment in commercial fishing
- reduced family income
- reduced access to fish as component of household diet
- increased working hours for fishers, resulting in less time with family
- stress, depression, health impacts, reduced leisure activity
- reduced quality of life
 - physical and mental well-being of fishers (e.g. short/ long term pressures resulting from lifestyle changes)
 - loss of pride and expertise due to shifting out of fishing or being less able to fish due to declines in fishing productivity/ profitability
 - increased incidence of depression and/or divorce
- varied type and degree of other social impacts

Adjustment costs if shift out of fishing or to a new region

- relocation costs if shift away from region currently fishing in as result of declaration of MPA
- retraining costs if shift out of fishing as result of declaration of MPA
- social dislocation and adjustment to shifting away from local community.

Impacts on businesses that supply fishers, and transport/process catch

- reduced value-added from fish processing
- reduced catch and/or fishing business viability may lead to reduced demand for boats and supplies eg fuel, bait, ice
- reduced catch may lead to reduced demand for services of transport industries (for transportation of catch to markets)
- reduced catch may result in impacts on processors in sourcing fish supply for their operations
- resultant impacts to employment and income in the equipment, supply, transport & processing sectors
- resultant impacts on social and economic well-being of those affected by reduced demand.

Flow-on impacts

[Note: these include both ‘indirect’ and ‘induced’ economic effects as defined by economists]

Impacts on local/regional communities

- reduced spending by fishers and fishing families in regional communities (both on fishing business related items and on consumer items), with flow-on impact on income and employment of other businesses in the region and associated social impacts
- decline in small businesses and services in regional areas
- reduced viability of small towns
- loss of amenity value & community identity (e.g. fishing villages)
- infrastructure costs eg for marinas, jetties etc may have to be borne by different users
- potential increase or decrease in tourism activity, depending on types of fishing allowed in MPA areas and potential for tourism associated with MPA
- improved community perceptions of the sustainability of wild-catch fisheries (e.g. industry involvement in/cooperation with MPA process).

Impacts on fishing community

- increased competition from displaced fishing effort
- reduced opportunities for new entrants to fishing industry overall
- loss of fishing knowledge and skills due to reduced entry of new fishers, and skills not passed on.

Impacts on consumers and the broader economy

- increased costs for consumers (e.g. higher prices for some seafood)
- potential loss of health benefits to seafood consumers

- improved community perceptions of the sustainability of wild-catch fisheries (e.g. industry involvement in/cooperation with MPA process).
- changes in export earnings.

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