

Marine Protected Areas in inshore waters: guidance for undertaking Socio-Economic Impact Assessments (SEIA)

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Section 1. Introduction

Background

The Scottish Government's vision is for a marine environment that has clean, healthy, safe, productive and diverse seas; managed to meet the long term needs of nature and people.

Our seas account for 61% of UK waters and remain at the forefront of our food provision through fishing and aquaculture, our energy needs as we transition from oil and gas to renewable energy, as well as recreational activities and eco-tourism.

Scottish Ministers have national and international commitments to create a network of Marine Protected Areas (MPAs) which:

- Contributes to conservation or recovery of the marine environment;
- Represents the range of features present in Scottish waters; and
- Reflects that the conservation of a feature may require the designation of more than one MPA.

Scotland's MPA network is being developed to help safeguard our most important natural and cultural heritage features on the principle of sustainable use. By doing so we are protecting the natural goods and services they provide for current and future generations to enjoy.

The MPA network consists of sites designated for nature conservation, historic environment or research purposes. 'MPA' is the generic term used to refer to a site which has been created for marine protection and which contributes to our overall MPA network. The network is mainly composed of Nature Conservation MPAs, Special Areas of Conservation (SACs) and Special Areas of Protection (SPAs), alongside areas that provide nature conservation benefits (called Other Area Based Measures), protect the historic environment (Historic MPAs), and areas for demonstrating or researching marine management. The network currently consists of 245 sites that cover 37% of our seas.

This guidance has been developed primarily for assessment of MPAs and related management measures. However it is likely that this can be used as a framework for informing decision-making across other inshore conservation measures.

Legislative mechanisms

Marine Protected Areas for nature conservation are designated by Scottish Ministers under S. 67 of the Marine (Scotland) Act 2010¹ for inshore waters and S. 116 of the Marine and Coastal Access Act 2009² for offshore waters.

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), together called European sites, were selected and designated under the EU Habitats and Birds Directives, respectively. Now that we have left the EU, the provisions relating to the protection of these sites are retained in the Conservation (Natural Habitats, &c.) Regulations 1994³ and the Conservation of Offshore Marine Habitats and Species Regulations 2017⁴. These Regulations also provide for designation of additional SACs and SPAs if required.

Each site is designated for the protection of particular 'protected features' – habitats or species of importance - and has stated conservation objectives which describe the current and desired ecological or geological state (or quality) of each protected feature. These are used to indicate whether the purpose of the site is to maintain the status of the feature in its current state or to restore it (where there is evidence of a decline in feature quality).

The responsibility for site management generally sits with Public Authorities who regulate activities. The Marine (Scotland) Act 2010 places duties on Public Authorities in relation to their own functions and any decisions they make to allow regulated activities to take place. In some cases specific measures may be required. The Marine (Scotland) Act 2010 provides powers to Scottish Ministers to implement Marine Conservation Orders, where necessary, to further site conservation objectives.

In order to ensure that conservation objectives of the site are achieved, certain activities may be restricted or limited within the site. This can be done by implementing a Marine Conservation Order (MCO)⁵ or Inshore Fishing Order⁶. MCOs can be used to further the conservation objectives of an MPA (or European site which overlaps with an MPA) by prohibiting, restricting or regulating a wide range of activities. Inshore Fishing Orders, as the name suggests, can only manage fishing activity and may restrict the use of particular types of fishing gear across all or part of the site and may be seasonal.

¹ [Marine \(Scotland\) Act 2010 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/2010/24/section/67)

² [Marine and Coastal Access Act 2009 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/2009/22/section/116)

³ [The Conservation \(Natural Habitats, &c.\) Regulations 1994 \(legislation.gov.uk\)](https://www.legislation.gov.uk/uksi/1994/2400/made)

⁴ [The Conservation of Offshore Marine Habitats and Species Regulations 2017 \(legislation.gov.uk\)](https://www.legislation.gov.uk/uksi/2017/1000/made)

⁵ Under S. 85 of the Marine (Scotland) Act 2010

⁶ Under S. 1 of the Inshore Fishing (Scotland) Act 1984 for inshore waters or S. 137A of the Marine and Coastal Access Act 2009 for offshore waters.

Inshore Fishing Orders may be used to regulate fishing activity and protect marine habitats and species within or outside of MPAs. Currently, Scottish Government is considering the protection of Priority Marine Features (PMFs)⁷ outside of MPAs. PMFs are habitats and species which are of particular conservation importance in Scotland⁸. PMFs are often located within MPAs but they also occur outside the MPA network. The Scottish Government is undertaking a review of the 11 PMFs most sensitive to mobile bottom-contacting gear, and considering implementing fisheries management measures to protect these outside the MPA network.

How MPAs cause socio-economic effects

Designation of MPAs and subsequent management decisions may lead to socio-economic effects, which may be positive or negative. MPA designation will help to conserve the range of biodiversity in the site and for Scotland as a whole, and will contribute to an ecologically coherent network of marine protected areas. Additionally, MPAs can contribute to the ecosystem services benefits which we derive from the marine environment. These can include provisioning services (such as fish and shellfish for consumption), regulating services (such as coastal protection or climate regulation) or cultural services (such as tourism benefits). Part of these ecosystem services can also include non-use value which is the benefit people get simply from being aware of a diverse and sustainable marine environment even if they do not themselves 'use it'.

MPAs may also have negative effects on social and economic activities, where they are regulated or prohibited within a site. Once an MPA, SAC or SPA is designated it becomes a legal requirement for public authorities to consider impacts of regulated activities on the achievement of site conservation objectives. Such assessments are aided by the production of management advice by Statutory Nature Conservation Bodies (SNCBs) e.g. the Joint Nature Conservation Committee (JNCC) and NatureScot, which outline the sensitivity of protected features to different activities.

Under S. 48 of the Conservation (Natural Habitats, &c.) Regulations 1994, competent authorities must undertake an appropriate assessment of an activity before consenting it, if it is likely to have a significant effect on a European site in Great Britain or a European offshore marine site (either alone or in combination with other plans or projects), and is not directly connected with or necessary to the management of the site⁹. Similar provisions exist in relation to MPAs¹⁰. Therefore activities which require consent from a competent authority (such as planning

⁷ [Marine environment: Priority Marine Features - gov.scot \(www.gov.scot\)](http://www.gov.scot)

⁸ [Priority marine features in Scotland's seas | NatureScot](#)

⁹ <https://www.legislation.gov.uk/ukSI/1994/2716/regulation/48/made>

¹⁰ S. 83 of the Marine (Scotland) Act 2010 for inshore sites and S. 126 of the Marine and Coastal Access Act 2009 for offshore sites.

permission or a marine licence) can be affected by the designation of an MPA. Examples of these activities may include; aquaculture, coastal protection, renewable energy generation, oil and gas, and ports and harbours. Authorities may put restrictions on activities such as locating aquaculture developments away from features which are sensitive or prohibiting use of certain acoustic deterrent devices. Such restrictions may increase costs for those carrying out these activities.

Commercial fishing activity is not directly limited by the designation of an MPA. If an MCO or Inshore Fishing Order is implemented, fishing activities can be affected, with potential socio-economic consequences for fishers, related industries and businesses e.g. seafood processing.

Recreational activities such as sailing, swimming and wildlife watching are typically less likely to have an impact on MPA conservation objectives and therefore are not generally affected by the designation or management of an MPA.

Changes to the coastal environment and to coastal industries may have knock on effects for coastal communities or those dependent on marine industries.

Social and economic assessment

A Socio-Economic Impact Assessment (SEIA) can be undertaken to ensure that positive and negative impacts to people and businesses are considered before undertaking a policy change. Under the Marine (Scotland) Act 2010, when considering whether it is desirable to designate an area as an MPA, Scottish Ministers may have regard "*to any social or economic consequences of designation*"¹¹. This does not apply to European sites. Scottish Ministers also have a duty to assess "*the impact or potential impact of the restriction or prohibition within the area protected by the order*" and "*the impact or potential impact of displacement*"¹² where an activity is restricted or prohibited by an MCO. The Scottish Government may choose to undertake an SEIA to inform these considerations.

The SEIA may also be used to inform a Sustainability Appraisal, along with the Strategic Environmental Assessment (SEA). The purpose of the Sustainability Appraisal is to assess the overall social, economic and wider environmental impacts. They can also be used to provide Ministers with the information they need decide on the designation or management of MPAs, along with the outputs of stakeholder engagement and public consultation.

¹¹ S. 68 of the Marine (Scotland) Act 2010

¹² S. 91 of the Marine (Scotland) Act 2010

Section 2. How to use this guidance

Step-by-step guidance

This guidance sets out Marine Scotland's recommendations for carrying out Socio-economic Impact Assessment for Marine Protected Areas. The guidance is not intended to be prescriptive in relation to the methods, data or specific impacts to be included. This means that the SEIA approach can be tailored to the context in which it is being done.

The guidance will be used by Marine Scotland when developing and evaluating tenders for producing the SEIAs for MPAs. The guidance will also help contractors to understand what is required of them when producing the SEIA. The successful contractor will be able to draw on the guidance, as well as advice from Marine Scotland analysts when producing the SEIA. This process ensures that the data and methods used are appropriate for the specific context, and that they are up to date.

The guidance is presented in 10 key steps. The tasks that need to be done at each step are briefly described, together with some key considerations, and links are provided to other methodological sources that the user may find useful. Although the steps are set out chronologically, it should be noted that SEIA is an iterative process, the findings at each stage are likely to inform each other, and some re-assessment may be needed. It might also be necessary to repeat some activities at different times in order to develop the most accurate picture.

The requirements for social and economic impacts differ at certain points. Where it is expected that a specific economic or social methodological approach is needed, this is highlighted. If a distinction is not made explicit the reader should assume the guidance is the same for both social and economic impacts.

- Step 1. Description of proposals
- Step 2. Define impact area
- Step 3. Stakeholder mapping
- Step 4. Engage with stakeholders
- Step 5. Gather contextual information
- Step 6. Scoping
- Step 7. Baseline analysis
- Step 8. Predict impacts
- Step 9. Management and monitoring
- Step 10. Complete SEIA

Combining the social and economic elements

Socio-economic impact assessment gives consideration to a wide range of impacts on people, communities and society. The boundary between what is economic and what is social is not always clear, and there is some degree of overlap and interaction between them. An economic impact can also have social consequences

and vice versa. A good SEIA will take this inter-relationship into consideration when assessing impacts, and when communicating them with stakeholders.

In this guidance we bring together the two practices (social and economic impact assessment) so that the full range of impacts affecting populations, their health, wellbeing and prosperity can be assessed at the relevant local, regional and national levels. Importantly, this allows for the links and interactions between the two assessments to be explored, highlighted and communicated.

For some initial steps of the assessment process, the economic and social assessments involve the same or similar processes e.g. describing the MPA and associated management measures, defining the impact area, and identifying stakeholders. The two assessments diverge in methods used at step 7 when baseline analysis and impact prediction are to be conducted. Whilst there will be interaction between the two types of impact, it may be easier for results to be presented separately in the SEIA report.

We propose that the whole assessment will benefit from taking a participatory approach whilst also ensuring that specific methods from each discipline are used. It is important that stakeholders are engaged on the full content of the impact assessment covering both social and economic considerations.

Incorporating a natural capital approach into the assessment process

The natural capital approach is a concept that aims to better account for the contribution of the environment to economic and social outcomes. Natural capital refers to the stock of natural assets which directly or indirectly underpins value to people, including ecosystems, species, freshwater, soils, minerals, the air and oceans, as well as natural processes and functions¹³. Ecosystem services are the flows of benefits provided by natural capital assets that support economic activity and human well-being. Ecosystem services can come in the form of provisioning (e.g. fish capture), regulating (e.g. carbon sequestration), supporting (e.g. nutrient cycling) and cultural (e.g. tourism) services. The socio-economic value of a natural capital asset is derived from its ability to deliver ecosystem service flows both now and in the future.

¹³ [Natural Capital Terminology \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

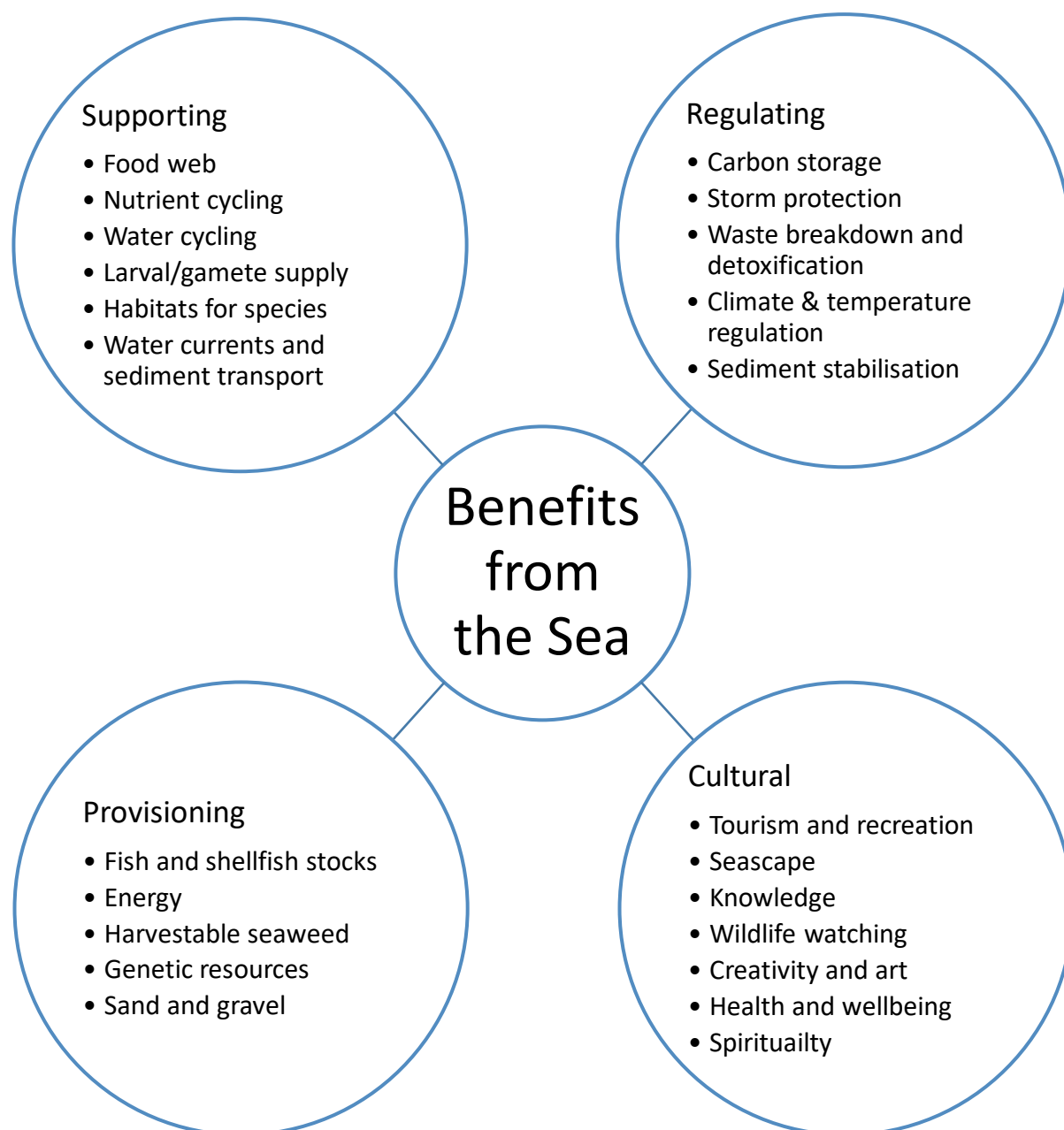


Figure 1: The benefits provided from the seas. Ecosystem service can be supporting, regulating, cultural or provisioning. Adapted from: [Natural capital, ecosystem services and the Blue Economy | Scotland's Marine Assessment 2020](#).

The value of a natural capital asset can come in several forms and may be split by its use and non-use value. Use values include direct use value (e.g. food) and indirect use value (e.g. flood protection, air filtration)¹⁴. Option value is also considered to be a use value and relates to the value people place on having the option to use a natural capital asset in the future. Non-use values include bequest values (e.g. values attached to future generations) and existence values (e.g. value people place on knowing that something still exists).

¹⁴ [Enabling a Natural Capital Approach \(ENCA\) - GOV.UK \(www.gov.uk\)](#)

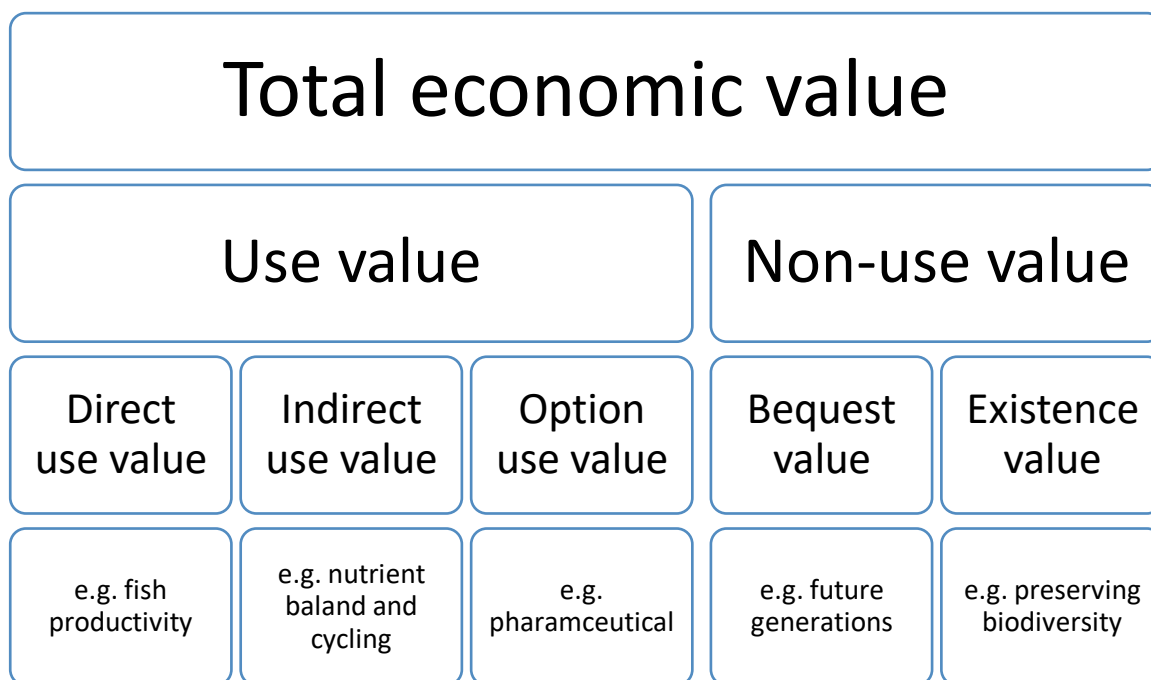


Figure 2: The total economic value of natural capital assets is made up of use value and non-use value. Use value includes direct use value (e.g. fish productivity), indirect use value (e.g. nutrient balance and cycling) and option use value (e.g. pharmaceutical). Non-use value includes bequest value (e.g. future generations) and existence value (e.g. preserving biodiversity). Source: [Marine Biodiversity: An Economic Valuation](#).

The impact of proposals on natural capital and ecosystem services should be considered throughout the SEIA process. Changes in the extent and condition of natural capital assets will impact their ability to deliver ecosystem services, which provide benefits to economic activity and human well-being. As such, any impact on natural capital has implications for social and economic outcomes.

Natural capital is important at local, regional and national levels. For example, the marine environment may be important for a local community's sense of place, as well as supporting regional economic activity such as wildlife watching. At the national level, wider society may attach value in knowing that a natural asset still exists and express a willingness for it to be protected. Natural capital impacts should be considered across all of these levels.

It is recognised that scientific and valuation evidence gaps may limit the ability to perform a comprehensive quantitative natural capital assessment; however, effort should be made to incorporate the best available evidence that exists at the time of assessment, even if that is only qualitative or caveated with uncertainty. It also may not be possible to monetise certain natural capital impacts and if this is the case then a qualitative assessment should still be undertaken to ensure important non-quantifiable impacts are considered. If any aspect of the natural capital assessment is not possible, an explanation of why this is the case should be included. Further details on incorporating a natural capital approach into the assessment process are available in Annex 2.

Data collection and analysis

It is likely that a range of data sources and methods will be needed to accurately assess expected impacts relating to an MPA and its management measures. This is partly due to the different stakeholders and activities involved and the varying amount of data available for them. It may be that there is no data available regarding a particular marine activity, or it is not captured at a sufficient geographic scale for analysis at the localised level. In these cases it may be necessary to collect primary data i.e. through surveys or interviews. Equally the type of analysis that can be done, will depend on the type of data available. Annex 4 contains information about different data sources, and how they can be used, as well as links to guidance for data analysis methods. The decision on whether to collect additional data and how to undertake analysis will lie with the body undertaking the assessment (e.g. contractor or Scottish Government), taking account of proportionality and feasibility where required.

Section 3. Step-by-step guidance

Step 1: Description of proposals

Description: The first step is to develop a detailed description of the proposals including whether proposals relate to the designation of a new MPA site and/or if they involve the implementation of fisheries management measures. A description of the MPA boundary may be provided as part of the SEA, but additional details may be required for the SEIA.

Purpose: This allows for a thorough understanding of all aspects of the proposals which could generate social and economic impacts, as well as when, where and how they might occur. The description is the starting place for engaging stakeholders on the baseline and predicted impacts.

Practical considerations:

- Location, content and time frame of proposal:
 - Where is the MPA or where are the measures going to be introduced?
 - What do the proposed measures include? Provide specific details on the content of proposals.
 - What is the environmental context to their introduction?
 - When are the proposed measures planned to be introduced?
- Implications of proposal:
 - What industries currently operate within the proposed area?
 - What economic activities will be positively or negatively affected by the measures?
 - What other activities (including wellbeing, recreational or community) will be affected by the measures?
 - What impact will the measures have on ecosystem services (including provisioning, regulating and cultural), now and in the future?
- It is important to include as much detail as possible. If it is the case that details are not available, offer an indication of how the evidence gaps will be filled i.e. through engagement and impact prediction.

Step 2: Define impact area

Description: It is important to set out the geographic area(s) on land where social and economic impacts will be experienced, taking into account the locations and connections between any industries and activities occurring near or in the MPA, and how they relate to activities on land (described in step 1). Defining the impact area is informed by an understanding of who might be affected as well as what the impacts might be, and so should be done iteratively with steps 3 and 8.

Defining the impact area for a protected area in the sea can be more challenging than for protected areas on land. Marine users and industries can have social and economic ties to settlements along the coast, potentially at some distance from the MPA. The impacts will, therefore, not all be experienced within the protected area (as on land) but potentially in numerous communities in a range of locations.

Purpose: to develop a clear understanding of the locations where social and economic impacts will be experienced and to identify which will be the most appropriate population settlements and locations to cover in the SEIA. The defined impact area will determine which communities and stakeholders are involved in the impact assessment. In terms of economic impact, accurately defining the areas affected will inform understanding of the level at which impacts are likely to occur and allow for the assessment of cumulative impacts of MPA measures.

Practical considerations:

- Activities taking place within or near the MPA, and the locations these relate to on land, will form the basis of the impact area. For example these might include the registration and landing ports of vessels that fish in or around the MPA, or the settlement where a wildlife tourism business that operates in the area where the MPA is based.
- To capture the full impact area it may be necessary to look at secondary or supporting industries such as seafood processing, suppliers of fuel and equipment etc.
- Proximity to the MPA should also be a factor, if appropriate. There may be communities near the MPA who experience impacts linked to the improved environmental status of the area, and there may be new opportunities that arise, that are not linked to existing activities.
- There are a number of different types of community that should be considered, which affect the definition of the impact area:
 - “Communities of place”: the people who are connected through living in a particular place – in this case living in communities near an MPA.
 - “Community of practice”: those who are connected through activities or livelihoods that they have in common even if they do not share the place. For example, fishers may live in a variety of coastal locations, but are linked through the practice of fishing (See Annex 1).

- “Community of interest”: a community of people who share a common interest or passion, but may not be linked in any other way. For example this may include those with an interest in marine conservation.
- Level: some impacts may occur at different geographical levels i.e. local, regional, Scotland or UK. There may be a mix of positive or negative impacts at different levels.
- There is a risk that some communities or people who feel they should have a say, are missed out of the impact assessment if the impact area is too narrowly defined. An inclusive approach should therefore be taken when defining the area of impact.
- In defining the impact area, it may be useful to consider boundaries or units of area for which there is data available both on land and at sea, such as datazones, settlements, localities or nations, and ICES rectangles.

Step 3: Stakeholder mapping

Description: Identify groups and individuals who may be affected by or have an interest in the proposals.

Purpose: Knowing who might be affected by an MPA or fisheries management measures is important for gaining a thorough understanding of potential impacts, and is essential for enabling stakeholder engagement and participation.

Practical considerations:

- Stakeholder mapping and defining the impact area are linked and will likely feed into each other, and so these steps should be carried out iteratively.
- It may be useful to get a small group of people with knowledge of the MPA, with diverse interests and perspectives, to put together a list of relevant stakeholders, or check over any list produced. This ensures that any 'blind spots' are accounted for, and that the list is comprehensive.
- The stakeholder list or map should include any marine users, industries or businesses operating within the MPA boundary or nearby.
- It may be helpful to look at the legal implications of the designation and management measures to identify who might be affected.
- Stakeholder groups may include, but not be limited to, commercial sea fishing, recreational fishing, tourism, aquaculture, Offshore Renewable Energy (ORE), community groups and NGOs, and nature restoration and research projects.
- Efforts should be made to include all those who might be affected by the MPA and associated management measures, especially lesser heard voices.
- The wider public living in communities near the MPA should also be included as stakeholders i.e. some people feel sense of wellbeing knowing the MPA exists, equally they may be aware if the local economy has been affected negatively.
- It may be helpful to categorise stakeholder e.g. by level of impact primary (direct), secondary (indirect), tertiary (induced).
- While it is important to include all stakeholders that may be impacted, positively or negatively, by the MPA and management measures, some groups may be affected more than others. This will vary on a case by case basis, and should be captured in the subsequent stages of data collection and analysis.

Step 4: Engage with stakeholders

Description: This step is important and should continue throughout the entire SEIA process. It involves ensuring there are appropriate governance structures to enable effective engagement with communities and other stakeholders which will help to manage competing needs or divergent views where these exist. This step should include holding participatory engagement and consultation events.

Purpose: To ensure that effective engagement processes are put in place so that community members and other stakeholders are fully informed about:

- details of the proposals;
- how they can be involved in the SEIA;
- their rights with regard to the project; and
- their access to grievance and feedback mechanisms.

By devising inclusive participatory processes and deliberative spaces, community members and other stakeholders will be able to:

- understand how they might be impacted;
- understand if and how they can influence and contribute to decisions being made;
- contribute to mitigation and monitoring plans; and
- prepare for change.

This will also enable those carrying out the SEIA to develop a detailed understanding of the impacted communities and other stakeholders through data collection and research about:

- the needs, values and interests of stakeholders;
- the relevant history of the community; and
- who the relevant groups are and any connections or dependencies between them.

Practical considerations:

Note that the following are considerations for engagement throughout the full SEIA process. Not all are relevant at every stage.

- Early engagement is very important in order to ensure that there are good relationships between stakeholders and officials. Meaningful engagement should include good communication around why and when decisions are made, which increases likelihood of public acceptance.
- Engagement should take place throughout the SEIA process and will be required in some form for steps 5-9. The practitioner/consultant can decide how best to arrange the engagement to achieve the objectives of the SEIA and take account of the considerations listed here.
- Engagement should be done sensitively, taking account of past experiences and stakeholder relationships: poor engagement can be an impact in itself, and so can the uncertainty that often accompanies it.

- It is vital that communication is two-way and that stakeholders understand the opportunities and limitations around how they can influence the process.
- Stakeholders should be given ample warning of events so that they have time to prepare and make plans to attend.
- Care should be taken to organise events in such a way that all those who want to can take part e.g. making sure that scheduling takes account of working hours, child care commitments, accessibility (disabled access, availability of internet etc.).
- Certain industries (e.g. fishing) have irregular hours which need to be taken into consideration.
- Engagement should be designed so that lesser heard voices are included and that those who are particularly vocal, concerned or well organised do not dominate the exercise.
- Make use of existing groups and forums where relevant or feasible such as Regional Marine Planning Partnerships, residents' associations, community councils or networks.
- The views and suggestions made during the stakeholder engagement process should be captured and reported, along with information about how the feedback was dealt with.
- Explaining why decisions have been made, and why some feedback has been acted on, and others have not, is an important part of introducing transparency to the process.
- Stakeholder engagement will also include data gathering using interviews and surveys. This will provide important detail and context for Steps 5, 6 and 7.

Step 5: Gather contextual information

Description: Develop a social and economic profile of the area including history, culture and context.

Purpose: To develop a full and complete understanding of the communities and stakeholders in question and the context that the MPA and management measures will be fitting into. This will help to reduce the potential for conflict and misunderstandings.

Practical considerations:

- Information may come from a desk-based study and from engaging with the community (i.e. interviews and surveys etc.) (See Annex 4).
- This step could be carried out in parallel with Step 4.
- This step may include collecting evidence and data on the following as required:
 - the history of the area and its communities;
 - current trends in communities;
 - demographic profile and any equalities issues;
 - local industrial structure/ major industries in the area (e.g. extent of dependence on industries such as fishing);
 - profile of local skills and qualifications;
 - the impacts of previous marine developments and designations, how this was experienced and how this is currently viewed;
 - social and cultural values;
 - community assets, strengths and weaknesses;
 - trends in natural capital and ecosystem services (See Annex 2).
- It may be helpful to enlist the help of key stakeholders (as determined during stakeholder mapping exercise) to advise and to check interpretations.

Step 6: Scoping

Description: Scoping involves identifying the range of potential social and economic impacts, or issues, associated with proposals in order to identify those that require further, more detailed assessment.

Purpose: Scoping is a preliminary process that produces an interim list of issues to be further considered during Steps 7 and 8. This two stage process ensures transparency and inclusivity, especially as it may not immediately be obvious what the social or economic impacts might be. At this stage all impacts are considered and those that are pertinent are scoped in for further consideration in Steps 7 and 8.

Practical considerations:

- Anything can be a potential impact if it is valued by a specific group of people and is related directly or indirectly to the proposal. It is important to emphasise that any assessment must include the issues that stakeholders themselves deem to be important relating to the MPA and management measures.
- Scoping should also include the potential impact of proposals on natural capital and ecosystem services (see Annex 2).
- Information should be gathered from a range of sources including a desk based study of similar cases, expert opinion and suggestions from relevant stakeholders.
- A combination of technical (literature and expertise) participatory and social research approaches are, therefore, required (See Annex 4).
- It may be helpful to develop a framework to assess the potential impacts. This could include a preliminary assessment of the following:
 - level at which the impacts will occur, covering local, regional, and national levels;
 - probability of the anticipated impact occurring;
 - duration that the impacts are expected to last for;
 - benefits and costs associated with the impact;
 - reversibility of the impacts;
 - likelihood of cumulative or secondary impacts;
 - relevance to policy decisions;
 - uncertainty of effects;
 - disagreement or opposing views about an issue.
- It is also important to consider how impacts may affect the well-being of various stakeholders. This may include less tangible impacts such as:
 - culture and heritage;
 - connection to nature or landscape;
 - fears and aspirations;
 - identity;
 - values;
 - way of life.
- It is important to be transparent about why some impacts are included and others are not and this should be clearly communicated to all stakeholders as required.

- Scoping should include coverage of impacts on related sectors that use or rely on the marine space for their business such as (eco-)tourism, commercial sea fishing (including displacement and loss of opportunities), recreational fishing, water-sports, aquaculture, wild swimming, nature restoration, Offshore Renewable Energy (ORE) and so on.

Step 7: Baseline analysis

Description: Baseline analysis involves collecting evidence to describe the situation that would follow in the absence of intervention. In this case, this would consider the outcome of not designating a new MPA and/or introducing proposed fisheries management measures. The baseline is sometimes referred to as the counterfactual, do nothing or business as usual scenario. The quality of the baseline analysis will have a significant effect on the accuracy of the SEIA.

Purpose: This step provides a reference point in the analysis that can be used to compare predicted impacts against. This allows changes associated with the intervention to be identified. The baseline is used to assess the expected net impact of the proposals.

Practical Considerations:

- It is important that appropriate measures are chosen for the baseline and subsequent impact prediction. Appropriateness is linked to where impacts are expected. See Box 1 for examples of measures that could be used.
- The data used can be quantitative or qualitative (see Annex 4 for relevant data sources).
- The analysis may draw on a combination of existing datasets (secondary data) or primary data collected using appropriate research methodologies.
- The baseline analysis should cover all the relevant issues as far as possible and as is proportionate, not just things for which data are easily available. It is worth considering and reporting on the accuracy of the evidence and whether the use of proxy indicators is appropriate.
- The baseline should include an assessment of the local industrial structure, focusing on areas of expected impact.
- Where measures are likely to affect commercial or recreational fishing, baseline analysis should provide information on the current and predicted future levels (in the absence of intervention) of fishing activity within the proposed area, including important measures such as: landings by gear type, number of vessels, nearby port activity, employment and GVA (see Annex 1 for more info on fishing data).
- Uncertainties and assumptions made during the baseline analysis should be clearly identified (e.g. if it is assumed that an indicator remains constant over the relevant time period for the proposal).
- Exceptional years, due to factors such as COVID-19 or EU Exit, will need to be accounted for when developing the baseline. For example, this may involve using an average of prior years or using a different baseline year. Sensitivity analysis will be helpful when trying to determine how much exceptional years cause values to fluctuate (see Annex 3 for more details on sensitivity analysis)
- It is important to recognise that, under any scenario, the marine environment is highly unlikely to remain in a steady state so it is important to consider trends

over an appropriate timescale. The baseline should include information on the types of natural capital assets and ecosystem services that exist within the proposed area.

- Baseline analysis should use the best available evidence to provide an assessment of how natural capital assets and ecosystem services are likely to change over an appropriate period of time, under a do nothing scenario (see Annex 2 for further guidance on incorporating a natural capital approach into the SEIA).
- Stakeholders, including communities, may know of local, relevant datasets, which could supplement the core data used in the assessment, and so could be asked to input at this stage.
- When choosing measures or indicators, consider the frequency with which the data is collected and updated. It is also important to consider the level at which data is available and how relevant it is to the expected impacts.
- Where trends are being forecast, this should cover an appropriate time frame for the proposal.

Box 1: Variables

Some examples of variables that could be used in the SEIA are listed here, although these need to be adjusted on a case by case basis:

A variable is an element, feature, or factor that is liable to vary or change. A number of terms can be used to describe the change in a variable and so monitor that change e.g. measure, indicator, index. The degree of change in a variable can be estimated qualitatively or quantitatively and either through direct or indirect measurements:

- A measure is a direct measurement of a change in a variable e.g. average age of the population;
- An indicator is something that points to, measures or defines a concept in a practical way e.g. attendance at local events can be used as an indicator of social cohesion;
- A combination of indicators into a single score is called an index e.g. the social capital index.

There is considerable overlap in some social and economic impacts and the variables that are used to monitor them. For example, employment is a key social and economic impact but for different reasons. From an economic perspective, the variables would cover number and location of jobs, implications for other industries in the area (e.g. in terms of wages, worker availability), the relationship between employment and disposable income, and the broader socio-economic consequences for the area. From a social perspective there would be greater focus on the types and quality of jobs available, if they were evenly shared across the community, and the implications for health, wellbeing, security, identity and community cohesion.

Sometimes the same variable covers both social and economic impacts. We have therefore listed socio-economic variables without distinguishing between social and economic impacts. This is a long list and not all measures will be appropriate. The appropriate mix of variables to inform a baseline analysis will depend on the outputs from the prior steps in this guidance. It is likely that for each proposal there will be a more limited set of key performance indicators (KPIs).

Examples of socio-economic variables:

- Demographics – age and gender split
- Population change
- House prices
- Housing availability
- Education attainment
- Crime and fear of crime
- Health and wellbeing
- Deprivation
- Public satisfaction with local decision making
- Attitudes of ambition and aspiration for the community
- Community and cultural assets
- Local cohesion and solidarity (bonding social capital) e.g. attendance at local events, social capital index
- Communication and network building (bridging and linking social capital)
- % working age population in work
- % unemployment of economically active population
- % with no qualifications
- % with elementary occupations (SOC)
- Proportion of full time vs part time employment
- Median income, and range
- Employment density (jobs per 100 working age residents)
- Qualitative assessment or monetary valuation of natural capital
- Total GVA
- GVA, turnover and employment of relevant and related sectors
- Labour market conditions: employment/unemployment/skills shortages
- Education/skills levels in the relevant areas
- Quality of infrastructure available
- Employees' retail expenditure (induced)
- Planned development of existing commercial activities (e.g. tourism, fishing activity)
- Planned industrial development in relevant areas
- Extent and condition of natural capital assets
- Flows of ecosystem services

Step 8: Predict impacts

Description: Through analysis, estimate the social and economic changes and impacts that will likely result from the proposals. Predicting impacts¹⁵ is also sometimes known as impact assessment or options appraisal.

Purpose: predicting the impacts and assessing their significance allows Scottish Ministers determine whether the impacts identified are acceptable and whether mitigation or adjustments may need to be developed.

Practical considerations:

- This step may involve using a combination of quantitative and qualitative methods.
- It will be important to use relevant socio-economic indicators and measures capable of capturing the impacts under assessment.
- It may be helpful to consult with those carrying out the impact assessments for other receptors in the SEA and to consider the impacts on natural capital assets and ecosystem services. Changes in the physical environment often have positive or negative socio-economic consequences e.g. impacts on wildlife and seascape could have an effect on tourism, employment, sense of place, wellbeing, any impacts on spawning grounds could affect the fishing industry with knock on effects for employment, identity, social cohesion, cultural heritage.
- Stakeholders and communities may have local knowledge about particular impact pathways and so should be engaged.
- When assessing the economic impact it is important to determine the value of the direct, indirect and induced impacts, as well as short-term and long-term.
- Assessment of cumulative impacts will be necessary where there are a number of activities and marine users operating in the same area.
- Impact prediction should consider the potential displacement and knock-on socio-economic implications of fishing displacement, including on natural capital and ecosystem services, which proposals may result in.
- It is important to identify the distribution of positive and negative impacts among different groups and sections of society. Distributional impacts may be considered in terms of geographical area, urban/rural, socio-economic group, as well as the relevant protected equalities characteristics (e.g. age, gender, disability).
- Assessing the significance of impacts will be different in each case. What is significant will in part depend on the priorities and individual values of the stakeholders. There are a number of different methods used to assess significance. These may include, looking at the likelihood and potential scale of the impacts, and talking with stakeholders about their values. (see Annex 4)
- Uncertainty and assumptions should be clearly communicated.

¹⁵ The term 'predict' is more commonly used in the SIA literature. Economic impact assessments may use the term estimate or appraise. These terms refer to the act of assessing likely consequences of present day activities, through analysis of evidence.

Step 9: Management and monitoring

Description: The development of a management plan and monitoring strategy are considered best practice in relation to SEIA. This stage involves the use of relevant indicators or measures, as developed at step 7 and 8, plus any other data collection methods required, and a strategy for monitoring and auditing the social and economic impacts of the development.

Purpose: To monitor whether the impacts and any mitigation strategies are operating as expected; to ensure that all impacts, whether positive or negative are within the acceptable bounds; to check that the assumptions made when predicting and assigning significance to impacts have not changed; to enable those responsible to respond quickly and effectively to change, as needed; to compare predictions with actual impacts; and to build the evidence base in this area and maximise the opportunities to learn for the future.

Monitoring and management of MPAs is undertaken at a network level. Potential regional management approaches are being explored further under the Interreg-funded Marine Protected Area Management and Monitoring (MarPAMM) project¹⁶.

Site condition monitoring is also undertaken at the network level and is guided by the Scottish MPA Monitoring Strategy¹⁷. Monitoring of the economic impacts has been undertaken and a report of the socio-economic impacts of MPAs was published in November 2020.¹⁸

Practical considerations:

- Indicators benefit from being “SMART”, that is:
 - **S**pecific to the issue under consideration
 - **M**easurable in the sense that the data must be available
 - **A**ction-oriented in the sense that the indicator must be linked to a response mechanism
 - **R**elevant to the issue and accurate
 - **T**ime-sensitive, so that it is possible to track changes over a relevant period of time.
- Indicators should also be developed together with relevant stakeholders, for example by considering
 - whether the indicators are relevant;
 - do they measure what they are supposed to measure;
 - is there a better way to measure the issue based on local knowledge;
 - is anything missing that would be important to measure but is not covered in the monitoring plan.

¹⁶ [MPA management plans – MarPAMM \(mpa-management.eu\)](http://mpa-management.eu)

¹⁷ [Marine environment: MPA monitoring strategy - gov.scot \(www.gov.scot\)](http://www.gov.scot)

¹⁸ [Monitoring the socio-economic impacts of Marine Protected Areas: report - gov.scot \(www.gov.scot\)](http://www.gov.scot)

- They should be interpretable and communicable to stakeholders and interested groups.
- Where possible indicators should be developed so that they can crosschecked and compared with other data and other contexts.
- The frequency of measurement of each social indicator needs to be appropriate to each indicator and the severity (or significance in EIA terms) of the underlying issue.
- The key stakeholders need to agree on the key monitoring issues: the method by which measurement will happen, frequency of monitoring, responsible people, and most importantly, on the way that the results will be reported to all stakeholders.
- Once the indicators have been developed, they need to be collated into a monitoring plan. Monitoring plans need to be developed in a participatory way, and there needs to be careful consideration given to the governance and oversight of the monitoring process if it is to have legitimacy.
- The monitoring plan should be a dynamic, working document, and should be reviewed on a regular basis to determine whether all the indicators are still relevant, whether the methods of measurement remain appropriate (especially in the context of technological advances), and whether any new issues have emerged that should be included in the monitoring plan.
- The monitoring plan and performance against it should be openly available and accessible to the affected stakeholders. This is likely to be provided online.

Step 10: Complete SEIA

Description: Where it is deemed necessary, the SEIA should be completed before the MPA is designated or management measures are implemented. This should set out the results of the steps described previously in this guidance.

Purpose: To allow Scottish Ministers to take into account the predicted impacts as part of their decision making process, and to collect all of the outcomes of the previous steps in one place.

Practical considerations:

- The report should clearly describe the methods used during the impact assessment, justifications for decisions made, an outline of any uncertainties and assumptions, and the results of the analysis.
- Analysis or information which is specific to social or economic impacts should be presented separately, but the links between the two should be highlighted and explained.
- Where social and economic impacts overlap, they should be presented together and reviewed holistically.
- The final report should be clearly structured and include the following sections:
 - Introduction and description of the development
 - Description of the impact area and the method used for defining it
 - List of stakeholders and methods used for identifying them
 - Description of the stakeholder engagement strategy, including how marginalised groups are included
 - Profiles and contextual information for the relevant communities or regions within the impact area
 - Scoping assessment, including methods and data used
 - Section on economic impacts scoped in/out and justification
 - Section on social impacts scoped in/out and justification
 - Section on natural capital scoped in/out and justification
 - This section will largely be informed by the scoping report.
 - Baseline analysis, including methods, data used, and any assumptions/limitations
 - Section on economic baseline analysis
 - Section on social baseline analysis
 - Section on natural capital baseline analysis
 - Section summarising and combining economic, social and natural capital baseline analysis
 - Impact prediction, including methods, data used and any assumptions/limitations
 - Section on economic impact prediction
 - Section on social impact prediction
 - Section on natural capital impact prediction
 - Section summarising and combining economic, social and natural capital impact prediction

- Summary and overview of social, economic and natural capital impacts and their distribution – socially and geographically. When combining these elements, care should be taken to avoid double counting.
- Section on recommended management and monitoring.

Section 4. Annexes

Annex 1. How to use fishing data

The Scottish Government collects data on fishing vessel characteristics (length, tonnage, engine power etc), daily logbook estimates of catches at sea (voyage species, weight, ICES rectangle etc), landings data (actual weight landed), and sales information (first point of sale). This data can be used in conjunction with the methods set out in the step by step guidance, to add to the evidence base on potential impacts to fishers.

Description of the data

Spatial information is derived from two main sources:

- **Self-reported location.** All fishers must estimate on a daily basis the ICES rectangle (an administrative square approximately 30NM x 30NM¹⁹) where the majority of the catch was taken. Additionally, the owners of Scottish vessels less than 12 metres in overall length are requested to record (on Fish1 forms or paper logbooks) the latitude and longitude to nearest minute (approx. 0.6NM x 1NM) where the majority of the catch was taken. (This information may not be available for all years).
- **Vessel Monitoring System (VMS).** Vessels over 12 metres in overall length are required to be fitted with a VMS device which transmits the vessel location, course, and speed every 2 hours.

Using this data, it should be possible to identify which vessels fished in MPAs before management measures were introduced, and to estimate how much fish was caught in the MPA.

Limitations of the data

- **Self-reported location.** It can be difficult to corroborate self-reported data from smaller vessels. A review of Fish1 data for 2017-2019 suggests that 11.5% of positions are invalid (null, on land, or too far offshore) and anecdotal information from fishers suggests that the position recorded may reflect the harbour rather than the fishing location (using an appropriate grid size can account for this partially). Whilst ICES rectangles are recorded by all vessels, they cover large areas. Again, anecdotal information suggests that some fishers record the same ICES rectangle regardless of where they fish.
- **Vessel Monitoring System (VMS).** VMS is only available for larger vessels, and it reports the position of the vessel rather than the gear used. The logbook-linked analysis is better suited to mobile gears (trawling or dredging) rather than static (creels, longlines, gillnets). Fishing activity is inferred from the recorded speed, but not all activity at slower speeds is fishing (vessels

¹⁹ NM = nautical miles

can be manoeuvring, dodging etc). The reporting frequency of 2 hours does not capture all activity, although assessing over longer periods can account for this.

Identifying relevant vessels

Assessing fishing activity by UK vessels with overall length of 12m or greater:

1. Filter VMS data to only retain locations at “fishing speeds” (<6kn).
2. Link the filtered VMS data to the logbook voyage using the voyage departure and return times and activity dates.
3. Identify which activity days had VMS activity at fishing speeds within an MPA boundary for the preceding 5 years.
4. Determine how many logbook days were spent within an MPA

Assessing fishing activity by Scottish vessels with overall length less than 12m:

1. Extract reported latitude and longitude on Fish1 or paper logbooks, aggregate into 0.05 decimal degree C-Square grid.
2. Identify activity dates where the grid cell intersects with an MPA boundary for the preceding 5 years, if available.

Assessing fishing activity by other UK vessels with overall length less than 12m (or Scottish vessels which have not provided locations over a sufficient period):

1. Calculate the area of the MPA as a percentage of the total sea area of an ICES rectangle
2. Identify activity dates where the ICES rectangle intersects within MPA boundary for the preceding 5 years
3. Use the percentage area value to proportion the value.

Estimating catch from MPAs

There are two potential methods that can be used to estimate the total weight and value caught in MPAs before management measures were introduced. Which method to use will depend on the quality of data available. If the logbook and VMS datasets can be linked without introducing errors, then Method 1 can be used. If these two datasets cannot be linked, then Method 2 should be used.

Method 1:

1. Categorise relevant vessels (identified in previous section) by gear type
2. Determine how much time these vessels spent fishing in the MPA and average this for the 5 year period
3. Further categorise these vessels by time spent ‘fishing’ in the MPA i.e. 25-50 hours, 50-75 hours etc.

4. For these vessels, for each journey where 'fishing' takes place within the MPA boundary, determine the proportion of time spent fishing in the MPA relative to outside of the MPA
5. Use this information to determine the proportion of the landed total catch, and value derived, comes from the MPA
6. This should indicate what might be lost due to fishing restrictions, and who may be worst affected
7. It will also be possible to determine where these vessels are registered and where they land their fish. This information will help to define the impact area and identify stakeholders i.e. port authorities and communities of interest.

Method 2:

1. Categorise relevant vessels (identified in previous section) by gear type
2. Analyse the landings or logbook data for these vessels looking at the amount and value of fish landed and the species targeted
3. For particular vessels e.g. those who have spent a lot of time 'fishing' in the MPA, it may be possible to look at the total number of hours spent fishing over the 3 years period and the proportion of that time spent 'fishing' within the MPA boundary. This should give an indication of the impact that the MPA might have.
4. With a narrowed down list of vessels, it will also be possible to determine where these vessels are registered and where they land their fish. This information will help to define the impact area and identify stakeholders i.e. port authorities and communities of interest.

Assessing impacts

Once the affected stakeholders have been identified the potential impact of the MPA can be estimated including:

- potential displacement
- impact on gear conflict
- impact on landings and value/volumes by gear type and in port district level
- number of vessels affected,
- income and employment impacts
- turnover and GVA

Other impacts to consider include:

- Fuel costs, if there is a need to travel further to access grounds
- Knock on effects on health, wellbeing and families e.g. stress related to reduced income, staying out on the boat longer to reduce travel time
- Knock on effects for other businesses e.g. seafood processing, fuel providers, tourism, chandlery etc.

Annex 2. Natural capital assessment toolkit

Guidance on applying a natural capital approach

Within a proposed site, there will be many natural capital assets delivering a wide range of ecosystem services. The possible benefits and costs to ecosystem services will depend upon the effect that proposed measures have on the extent and condition of natural capital assets over the lifetime of an MPA.

When developing a methodological approach to assess the natural capital impacts of a proposal, it may be useful to first consult a collection of resources, supplementary to the HM Treasury Green Book²⁰, titled *Enabling a Natural Capital Approach (ENCA)*²¹. The ENCA resources contain services and asset databooks which include data sources, tools and studies – including economic valuation evidence – related to natural capital assessments. ENCA also provides a guidance document which summarises the natural capital approach and how to apply it. These resources are updated periodically and are intended to reduce search costs when screening for relevant evidence.

It is recommended that a four step approach, as is outlined in Green Book and ENCA guidance, is adopted for natural capital assessment. These steps are explained in more detail below. Further information can be found within the Green Book and ENCA resources, including an excel template to assist with the analysis²².

Step 1: Understanding the environmental context of the proposal:

The first step of the assessment requires the development of a baseline which should attempt to detail the extent and condition of the natural capital assets that currently exist in a proposed site and which are expected to be affected by the proposals, directly or indirectly. The extent and condition of these assets is unlikely to remain in a fixed state over time. As such, the baseline should not assume that natural capital assets and associated ecosystem flows will remain at their current level under a ‘do nothing’ scenario. Instead, it should consider how these assets will likely evolve over the time period of analysis under a ‘do nothing’ scenario.

A natural capital baseline should, where sufficient evidence exists, include:

- The extent and condition of natural capital assets within the proposed site, which are expected to be affected by the proposals, directly or indirectly, and how these will likely change under a ‘do nothing’ scenario
- A description of the ecosystem services that are provided by these assets

²⁰ HM Treasury, *The Green Book* (2020), accessed 02/12/2021, [The Green Book \(2020\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/472222/green-book-2020.pdf)

²¹ Department for Environment, Food & Rural Affairs, *Enabling a Natural Capital Approach* (2020), accessed 02/12/2021, [Enabling a Natural Capital Approach \(ENCA\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/472222/enabling-a-natural-capital-approach.pdf)

²² Ibid.

- An estimate of the flows of ecosystem services, in physical and monetary terms where possible, both now and in the future, under a 'do nothing' scenario

Step 2: Consider biophysical impacts of MPA on natural capital assets:

This step involves comparing the expected effect of the proposals on the extent and condition of natural capital assets against the baseline scenario. Condition metrics can be used to show the changes in the quality and state of natural capital assets over time. It is important to consider additional factors such as:

- The geographical extent and location of these effects
- Whether these effects are risks or opportunities
- The time frame these effects will occur over
- Expert opinion may be needed at this stage

Resources:

European Commission. (2018). *Mapping and Assessment of Ecosystems and their Services: An analytical framework for ecosystem condition*. Luxembourg: Publications office of the European Union. Available at: https://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/pdf/5th%20MAES%20report.pdf (Accessed: 11 October 2021).

The Feature Activity Sensitivity Tool (FeAST) developed by NatureScot may be a useful starting point when beginning to consider environmental effects. FeAST is a web based tool that allows users to investigate the sensitivity of various marine features to pressures as a result of human activities: [Feature Activity Sensitivity Tool \(FeAST\) | NatureScot](#)

Step 3: Consider the welfare implications:

The next step is to estimate the likely effects that changes in the extent and condition of natural capital assets will have on ecosystem services and the benefits they provide. Consideration of direct and indirect effects should be made. Effects will likely occur across different classes of ecosystem service (e.g., provisioning, regulating etc.) and care should therefore be taken to avoid double counting where there is overlap.

Specific effects to consider are:

- The effects of proposals on ecosystem services and associated benefits to society, estimated in physical and monetary terms, where possible. If it is not possible, an explanation of why should be included, alongside an evidence-based qualitative assessment
- The scale of population likely affected
- The robustness of any valuation estimates

There are several methods that are available for the economic valuation of natural capital. For provisioning services, market prices for goods and services can be used to measure the underlying value of an environmental asset. For regulating, supporting and cultural services, these tend to be harder to measure and non-market valuation techniques are often required. Where possible, a monetary valuation is preferred over physical units as a common metric allows for an easier comparison of relevant costs and benefits. Table 1 provides examples of methods that can be used to value natural capital assets.

Table 1: Methods to Estimate Economic Value

Valuation Method	Processes	Examples
Revealed preferences/market-based techniques	Involves observing preferences for marketable goods and services which include environmental factors	<ul style="list-style-type: none"> • Market prices for environmental goods/services (e.g., commercial fish) • House price premiums for nature views • Money spent by people visiting environmental sites for tourism and recreation
Stated preferences techniques	Involves estimating survey respondents' willingness to pay for a change in an environmental outcome. This could include contingent valuation methods or choice experiments to elicit values. Techniques tend to be based on hypothetical scenarios and are therefore subject to various biases	<ul style="list-style-type: none"> • Contingent valuation study of population on their willingness to pay for an environmental change • Choice experiment with a range of scenarios to assess respondents' preferences over different outcomes
Cost-based approaches	Cost-based approaches consider the costs that would be involved to provide goods and services normally provided by environmental assets. Examples of methods include: damage costs, replacement costs and opportunity costs	<ul style="list-style-type: none"> • Damage costs avoided: property damage likely to occur if natural flood protection was removed • Replacement costs: cost of replacing salt marsh flood protection with an artificial solution • Opportunity costs: activity foregone to achieve an environmental outcome

In some cases, it may be possible to use value transfer approaches which utilise secondary valuation evidence and apply it to a new context. This will require expert judgement to determine if relevant secondary evidence is available and can be appropriately applied. Where no market prices exist and relevant secondary valuation evidence is not available, primary valuation may be required. This would

involve primary data collection and/or modelling, and should be undertaken when it is proportionate and appropriate to do so (e.g., when analysis depends significantly on the magnitude of environmental effects). More detailed information on economic valuation techniques can be found within the Green Book and ENCA resources.

Examples:

Chae, D., Wattage, P. and Pascoe, S. (2012). "Recreational benefits from a marine protected area: A travel cost analysis of Lundy", *Tourism Management*, 33(4), pp. 971-977.

Kenter, J.O. et al. (2013). "The value of potential marine protected areas in the UK to divers and sea anglers." UNEP-WCMC, Cambridge, UK

Rees, S. et al. (2015). "The socio-economic effects of a Marine Protected Area on the ecosystem service of leisure and recreation", *Marine Policy*, 62, pp. 144-152.

Step 4: Consider uncertainties and optimise outcomes:

As any assessment on the effects of MPA proposals on natural capital will contain uncertainty, the final step requires considering this and attempting to minimise or mitigate where possible. The levels of confidence in all estimates provided in the analysis should be clearly stated. Furthermore, critical factors within the proposals that could have a major influence on natural capital effects should be highlighted, as well as measures that might be used to mitigate risks and maximise opportunities.

Annex 3. Economic methods toolkit

Direct, indirect and induced effects

Economic impacts can be categorised by direct, indirect and induced effects. Direct effects represent changes in economic outcomes for businesses directly impacted by the designation of an MPA and/or proposed management measures. Indirect effects refer to changes in economic outcomes in the supply chain of directly affected businesses. Induced effects stem from the changes in spending levels in the economy associated with the direct and indirect effects. Table 2 provides a hypothetical example of potential direct, indirect and induced effects for an MPA.

Table 2: Example of Potential Economic Effects

Direct Effect	Indirect Effect	Induced Effect
Change in local commercial fishing employment	Change in commercial fishing supply chain employment	Change in commercial fish and fish processing employees' retail expenditure

Opportunity cost

Opportunity cost relates to the foregone benefits of choosing one option over other options. When predicting the impacts of a proposal it will be important to consider opportunity costs. For example, opportunity costs may arise if proposals result in foregone revenues to some stakeholders. Further guidance on estimating opportunity cost is available in HM Treasury's Green Book²³.

Multipliers

Direct, indirect and induced effects can be estimated using multipliers, in terms of GVA, employment and income. Type I multipliers sum together direct and indirect effects while Type II multipliers also include induced effects. The latest multipliers for Scotland are available on the Scottish Government's website²⁴. The Supply, Use and I-O tables provide different multipliers which allow the estimation of different effects. For example, GVA multipliers can be used to estimate wider GVA effects while employment multipliers can be used to estimate wider employment effects. The use of multipliers should be clearly presented with reference made to the specific multipliers used.

Displacement

Displacement is the extent to which the economic effects that occur in one area or industry are offset by economic effects in another area or industry. In the case of an

²³ HM Treasury, *The Green Book* (2020), accessed 02/12/2021, [The Green Book \(2020\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/the-green-book-2020)

²⁴ The Scottish Government, *Supply, Use and Input-Output Tables* (2020), accessed 17/09/2021, [Information on the Supply, Use and Analytical Input-Output Tables produced by the Scottish Government](https://www.scotland.gov.uk/Information-on-the-Supply-Use-and-Analytical-Input-Output-Tables-produced-by-the-Scottish-Government).

MPA, this may relate to the displacement of fishing effort from within the proposed area to outside of its boundary. Indeed, evidence suggests this often occurs when fisheries management measures are introduced²⁵. The scale of the likely displacement of economic activity as a result of proposals should be detailed in the analysis.

Substitution

Substitution may occur when firms or individuals change their behaviour in response to proposals. For example, previous analysis of the socio-economic impacts of MPAs in Scotland suggests that substitution has occurred between fishing gear types where restrictions on the use of certain gear applies²⁶. The capacity for substitution will depend on the specific characteristics of the area under study and the content of proposed management measures.

Cumulative effects

Cumulative effects are changes that are caused by an action in combination with other actions. The designation of an individual MPA site may have a relatively small effect, but in combination with other planned developments and management measures in close proximity this effect may be amplified. Cumulative effects may be positive or negative.

Cumulative impacts can arise from:

- the interaction between MPA measures and other projects in the same area
- the interaction between the various impacts within a single MPA.

Where cumulative effects are expected to be a feature of an MPA, it is recommended that specific analysis is undertaken to identify the causes, pathways and consequences of the effects²⁷.

Optimism bias

Optimism bias is the demonstrated systematic tendency for appraisers to be over-optimistic about key project parameters, including capital costs, operating costs, project duration and benefits delivery. Over-optimistic estimates can lock in undeliverable targets.

²⁵ Scottish Government, *Monitoring the Socio-economic Impacts of Marine Protected Areas: 2019 Report (2019)*, accessed 11/10/2021, [Monitoring the socio-economic impacts of Marine Protected Areas: report - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/monitoring-the-socio-economic-impacts-of-marine-protected-areas-2019-report/pages/10.aspx)

²⁶ Scottish Government, *Monitoring the Socio-economic Impacts of Marine Protected Areas: 2019 Report (2019)*, accessed 11/10/2021, [Monitoring the socio-economic impacts of Marine Protected Areas: report - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/monitoring-the-socio-economic-impacts-of-marine-protected-areas-2019-report/pages/10.aspx)

²⁷ Marine Management Organisation, *A Strategic Framework for Scoping Cumulative Effects (2014)*, accessed 17/09/2021, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/389876/MMO1_055_Report_Final.pdf.

To reduce this tendency appraisals should make explicit adjustment for optimism bias. The Green Book recommends applying overall percentage adjustments at the outset of an appraisal. It is recommended that these adjustments be based on data from past projects or similar projects elsewhere, and adjusted for the unique characteristics of the project in hand. In the absence of a more specific evidence base, the collection of data to inform future estimates of optimism is advised, and in the meantime use the best available data. Ideally adjustments should be based on an organisation's own evidence base for historic levels of optimism bias. In the absence of robust organisation-specific estimates generic values may be used. For further guidance consult the UK Government's Green Book supplementary guidance: Optimism Bias²⁸.

Sensitivity analysis

Sensitivity analysis explores the sensitivity of the expected outcomes of an intervention to potential variations in key input variables, due largely to risk and uncertainty. In other words, how much does an outcome value fluctuate with a small change to an input value. Examples where using sensitivity analysis to explore the effects associated with changing variables are:

- Values given to time
- Wage rates used
- Costs associated with proposals
- The multiplier effect applied to the economic impact of an investment or scheme
- Environmental impacts

Techniques to deliver sensitivity analysis may include simple spreadsheet calculations, Monte Carlo simulation modelling or the use of qualitative decision trees.

Distributional analysis

Distributional impacts describe the distribution of impacts resulting from the project across different individuals, groups or businesses. This is a main feature of the social impact assessment but should also be a consideration in the economic impact assessment. For example, impacts may vary at the geographic level or by size of business.

Distributional weighting of impacts is possible but is often very challenging and can be highly subjective, any attempt of this should be presented clearly and transparently. In the absence of weighting, expected distributional impacts should be presented qualitatively through narrative and any analysis disaggregated to the appropriate groups or levels where possible, for example industry turnover by size of business.

²⁸ HM Treasury, *Green Book Supplementary Guidance: Optimism Bias* (2013), accessed 17/09/2021, [Supplementary guidance to the Green Book on estimates for a project's costs, benefits and duration in the absence of robust primary evidence](#)

Annex 4. Data sources and data collection

The SEIA assessment will require the use of various secondary data sources, as well as primary data collection where it is required (e.g. stakeholder surveys). Table 3 below includes a summary of data sources and guidance documents that may be useful for the assessment process, this is not an exhaustive list.

Table 3: Relevant Data Sources and Guidance Documents

Name	Summary	Link to Source
Marine Economic Statistics, 2018	Annual economic statistics publication including GVA and employment data for marine economy sectors.	Scotland's marine economic statistics 2018 - gov.scot (www.gov.scot)
Scottish Sea Fisheries Statistics, 2020	Provides data on the tonnage and value of all landings of sea fish and shellfish by Scottish vessels, all landings into Scotland, the rest of the UK and abroad, and the size and structure of the Scottish fishing fleet and employment on Scottish vessels.	Scottish Sea Fisheries Statistics 2020 - gov.scot (www.gov.scot)
Scotland's Marine Assessment 2020	This is an assessment of both the state of Scotland's seas and of the main activities and pressures in the various Scottish Marine Regions and Offshore Marine Regions	Scotland's Marine Assessment 2020 Scotland's Marine Assessment 2020
Monitoring the socio-economic impacts of Marine Protected Areas: 2019 report	This report provides an assessment of evidence on the socio-economic impacts of Scotland's Marine Protected Areas (MPA) since management measures were introduced in 2016.	Monitoring the socio-economic impacts of Marine Protected Areas: report - gov.scot (www.gov.scot)
Nomis Official Labour Market Statistics	Labour market statistics including data on employment, unemployment, qualifications, earnings etc.	Nomis - Official Labour Market Statistics (nomisweb.co.uk)
Scotland's Census, National Records of Scotland	Census data that provides information about the characteristics of people and households in the country.	Scotland's Census National Records of Scotland (nrscotland.gov.uk)

The Green Book	HM Treasury guidance on how to appraise and evaluation policies, projects and programmes.	The Green Book: appraisal and evaluation in central government - GOV.UK (www.gov.uk)
The Magenta Book	HM Treasury guidance on evaluation. Chapter 4 provides specific guidance on data collection, data access and data linking.	The Magenta Book - GOV.UK (www.gov.uk)
Enabling a Natural Capital Approach (ENCA)	Supplementary guidance to The Green Book. ENCA resources include data, guidance and tools to help understand natural capital and know how to take it into account.	Enabling a Natural Capital Approach (ENCA) - GOV.UK (www.gov.uk)
Socio-Economic Impact Assessment Guidance: Methods Toolkit for Participatory Engagement and Social Research	Provides details on participatory engagement and social research methods to assess socio-economic impacts.	Haggett, C. and L. Mabon (forthcoming). Socio-Economic Impact Assessment Guidance: Methods Toolkit for Participatory Engagement and Social Research"; The Scottish Government.

Annex 5. Glossary of terms

Additionality	A real increase in social or economic value that would not have occurred in the absence of the intervention.
Business As Usual	The continuation of current arrangements as if the intervention under consideration were not to happen. This serves as a benchmark to compare alternative interventions.
CBA	Cost Benefit Analysis
Community	A commonly used, yet contested concept that can apply at different levels, although generally referring to a place-based grouping of people who are presumed to have some sense of shared identity, some shared interactions of everyday life, and some common social and political institutions. Although individuals experience some impacts at a personal level, the general assumption in SIA is that people live, work and play in social groupings called communities, which are therefore a primary focus in SIA.
Community Cohesion	The aspect of togetherness and bonding exhibited by members of a community, the "glue" that holds a community together. This might include features such as a sense of common belonging or cultural similarity.
Counterfactual	Sometimes referred to as the baseline, business as usual or 'do nothing' scenario. The 'counterfactual' is what would have happened in the absence of the intervention, and impact is estimated by comparing counterfactual outcomes to those observed under the intervention.
Cultural Heritage	The legacy of tangible and intangible and natural heritage assets of a group or society that is inherited from past generations. Cultural heritage includes tangible culture (such as buildings, monuments, books, works of art), intangible culture (such as folklore, traditions, traditional knowledge), and natural heritage (including culturally-significant landscapes, important wildlife habitats).
Cumulative Impacts	Impacts which result from the incremental consequences of an action when added to other past and reasonably foreseeable future-actions.

C-Square	An acronym for <u>c</u> oncise <u>s</u> patial <u>q</u> uery <u>a</u> nd <u>r</u> epresentation system. A system of unique spatial identifiers for anywhere on the globe.
Datazones	A set of adjoining polygons with centroids that cover the whole of Scotland. Starting with school catchment areas, groups of complete Census Output Areas (COA) were brought together to form individual Data Zone boundaries that also respect physical boundaries and other boundaries of local significance.
Direct Economic Impacts	The contribution from the actual spend and employment which underpins the projects own day-to-day activities.
Economic Impacts	A financial effect that something, especially something new, has on a situation or person.
Ecosystem Services	Ecosystem Services are the direct and indirect contributions ecosystems (known as natural capital) provide for human wellbeing and quality of life.
Fisheries Management Measures	Legal restrictions put in place to limit or control fishing activity.
Fish1 Form	Marine Scotland data collection system for under 10 metre boats which records the landings, species, and location of fishing activity for each week
GDPR	The General Data Protection Regulation 2016/679 is a regulation in EU law on data protection and privacy in the European Union and the European Economic Area. It also addresses the transfer of personal data outside the EU and EEA areas.
Gear Type	The type of equipment people use to fish (e.g. net or creel)
Good Governance	A normative understanding about how governance (of any organisation) should occur, including a commitment to accountability, transparency, the rule of law, capacity building, inclusive and participatory process

Governance	Refers to the ways organisations, institutions, businesses, and governments manage their affairs. It is the act of governing, involving the application of laws and regulations, but also customs, ethical standards and norms. (also see Good governance
GVA	Gross Value Added
Home Port	The port a fishing vessel is registered at
ICES	The International Council for the Exploration of the Sea. They are in charge of stock assessments and quota distribution and Marine Scotland provide them with data that is used in assessments and landings statistics
ICES squares/rectangles	A standardised division of the sea for statistical analysis, just like a map on land is divided into OS squares
Indicators	Data which provides a measure of a concept, and is typically used in quantitative research. An indicator is an observable and measurable entity that serves to define a concept in a practical way.
Indirect Economic Impacts	This includes the economic benefits from the projects suppliers using revenues from trading to, in turn, make expenditures on staff and other goods and services
Induced Economic Impacts	This includes the economic benefits from those employed directly by the project, spending their wages and salaries on good and services across the economy
JNCC	Joint Nature Conservation Committee
Landing Port	The port where a fishing vessel lands its catch
Leakage	Leakage is the extent to which effects “leak out” of a target area into others e.g. workers commuting into other areas to take up new employment opportunities.
Level of scale	Geographic area over which social and economic activities occur. Local, regional and national domains exist in a “form of hierarchy” that is not separate or discrete but interconnected.

Local	Geographic level describing the area immediately close to or affected by a proposal or activity
Logbook	A record containing data about a vessel's fishing activities. In the past this has been recorded on paper, but this system will be replaced by electronic logbooks which will record and submit the data automatically
MCO	Marine Conservation Order
Measures	Things that can be counted, such as personal income, household income, age, number of children, or number of years spent at school. Measures, in other words, are quantities.
Mitigation	The process of devising and implementing processes, procedures and/or changes to a planned intervention in order to avoid, reduce or minimise, or to compensate (offset) for impacts likely to be experienced.
MPA	Marine Protected Area. MPA is the generic term used to refer to a site which has been created for marine protection and contributes to the overall MPA network.
National	'National' could refer to Scotland or the UK. 'Scotland' or 'UK' are used for the most part in the guidance.
Natural Capital	That part of nature which directly or indirectly underpins value to people, including ecosystems, species, freshwater, soils, minerals, the air and oceans, as well as natural processes and functions.
ORE	Offshore Renewable Energy
OWF	Offshore Wind Farm
Participatory Methods	Participatory methods (PMs) include a range of activities with a common thread: enabling ordinary people to play an active and influential part in decisions which affect their lives. This means that people are not just listened to, but also heard; and that their voices shape outcomes.
PMF	Priority Marine Feature

Regional	Geographical scale encompassing a number of 'local areas' in a larger unit, smaller than the national level.
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SEIA	Socio-economic Impact Assessment
SIA	Social Impact Assessment
SNBC	Statutory Nature Conservation Body
Social Capital	Networks of relationships among people who live and work in a particular society, enabling that society to function effectively. It involves the effective functioning of social groups through interpersonal relationships, a shared sense of identity, a shared understanding, shared norms, shared values, trust, cooperation, and reciprocity.
Social Impacts	The effect on people and communities that happens as a result of an action or inaction, an activity, project, programme or policy.
SPA	Special Area of Protection
Stakeholder	Includes all individuals, organisations and interest groups who are affected by, or can affect, a given operation.
VMS	Vessel Monitoring System. An onboard tracking device that transmits a position at least every two hours. A legal requirement for fishing vessels over 12 metres overall length.



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