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Marine Scotland

Sea of the Hebrides possible Marine Protected Area

Partial Business and Regulatory Impact Assessment

June 2019

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Title of Proposal
Scottish Nature Conservation Marine Protected Area (MPA) Project, Socio-Economic Analysis, Sea of the Hebrides possible MPA

Background
The Scottish Government is committed to a clean, healthy, safe, productive and biologically diverse marine and coastal environment that meets the long term needs of people and nature. In order to meet this commitment our seas must be managed in a sustainable manner that balances the competing demands on marine resources. Biological and geological diversity must be protected to ensure our future marine ecosystem is continues to provide sustainable economic, environmental and social benefits.

The introduction of the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009 means the Scottish Government now has the authority to introduce statutory marine planning for Scotland's seas. The Marine (Scotland) Act provides powers to designate MPAs out to 12 nautical miles (NM), and the Marine and Coastal Access Act provides powers to designate sites in the rest of Scottish waters. There are currently 31 MPAs in Scottish Waters designated under these provisions. Four additional search locations were still being assessed at the time of consultation and these are now ready for Ministerial consideration.

Proposal and conservation objectives
The Scottish Government proposes to designate the Sea of the Hebrides as an MPA to further its conservation objectives.

Sea of the Hebrides pMPA encompasses three biodiversity features: basking shark, minke whale and fronts. The front feature, which appears during the spring and summer south-west of Tiree, provides an important functional link to both basking shark and minke whale by facilitating favourable feeding conditions. The protected features also include marine geomorphology of the Scottish shelf seabed interests as represented by the Inner Hebrides Carbonate Production Area.

Summary of Features and Conservation Objective - Sea of the Hebrides pMPA	
Proposed protected feature	**Conservation Objective**
Biodiversity: Basking shark; Fronts; Minke whale	Conserve
Geodiversity: marine geomorphology of the Scottish shelf	Conserve

Objective
The purpose of MPAs is to safeguard nationally important species, habitats and geology across Scotland’s marine environment. Correctly identifying critical areas for mobile species is more challenging than for low mobility or static features. Following the designation of 31 MPAs since 2014, Scottish Natural Heritage (SNH) have undertaken additional surveys and

research to provide advice on four additional locations. By adding more MPAs to the Scottish MPA network, we can improve the status of the marine environment by protecting a wider range of features. It also enable greater compliance with a range of national and international commitments as stipulated by:

- the Marine (Scotland) Act 2010
- the Marine and Coastal Access Act 2009
- the Convention on Biological Diversity
- The Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention)
- the EU Marine Strategy Framework, and Wild Birds and Habitats Directives

The Sea of the Hebrides site has been identified for designation as an MPA due to the confirmed presence of biodiversity features detailed above.

Evidence in this BRIA is drawn from the work of statutory nature conservation body SNH and consultants ABPmer and eftec. It brings together the science-led arguments for management and the projected potential social and economic consequences of such action. This BRIA examines the socio-economic effects of designating the Sea of the Hebrides as an MPA. The socio-economic effects of introducing specific management measures in the site are not considered here; once finalised, the introduction of any specific management measures will be accompanied by their own assessment.

The appraisal period for assessing the socioeconomic impacts covers the 20 year period from 2019 to 2038, although benefits will be delivered for longer if effective management measures remain in place. As with any socio-economic assessment related to environmental designations, the findings should be considered as estimates, and in cases where greater uncertainty exists, such as for fisheries, are deliberately presented as worst-case scenarios to build in necessary caution into each scenario.

In addition, a range of scenarios are presented to account for the inherent uncertainty associated with such proposals. Lower, intermediate and upper scenarios have been developed to reflect the requirements for management measures, the spatial extent of features and the extent to which features are already afforded protection. The intermediate scenario is viewed as the most representative estimate. The estimated impacts across the three scenarios commonly vary quite significantly.

Rationale for Government intervention

Scotland's marine environment provides: food; energy sources (wind, wave and tidal power, minerals and fossil fuels); harbours and shipping routes; tourism and recreational opportunities; and sites of cultural and historical interest. Scotland's seas contain important distinctive habitats and support a diverse range of species that require protection in order to be conserved or for recovery to be facilitated. There are a number of market failures evident in the ways in which the marine environment is utilised. These relate to:

- *Public goods*: A number of the benefits of the marine environment, such as the non-use value of biological diversity, have 'public good' characteristics; they are non-

excludable (no-one can be excluded from enjoying the benefits and non-rivalrous (enjoyment of the benefits they provide by one person does not diminish the benefits that are available to others). These characteristics of the benefits from the marine environment mean that private individuals do not have an incentive to voluntarily ensure the continued flow of these goods, which can lead to their under-provision.

- *Negative and positive externalities*: externalities occur when actions of marine users affect other parties positively or negatively, and this is not reflected in market prices. In many cases, the market does not account fully for the value of benefits and costs of the activities of marine users. In the case of negative externalities (positive externalities) this can lead to more environmental damage (fewer benefits) occurring from economic activity than would occur if the full cost (benefits) of economic activity was accounted for. For example, for marine harvestable goods that are traded, such as wild fish, market prices often do not reflect the potential damage caused to the environment by that exploitation.

Due to the competing demands placed upon Scotland's marine resources, market failures related to public goods provision and externalities will lead to insufficient protection of the marine environment if left to the market. This provides rationale for government to intervene to protect the marine environment.

Consultation

Within Government

Consultation has been undertaken with policy colleagues within Marine Scotland, including aquaculture, nature conservation, marine renewables, fisheries and fresh water fisheries.

Public Consultation

A stakeholder workshop took place during the development of the underpinning Sustainability Appraisal. This section will be completed following the public consultation.

Options

Option 1 - Do nothing

Option 1 is the 'Do nothing' option; this is the baseline scenario. Under this option, there is no designation and no change to management measures at the Sea of the Hebrides.

Option 2: Designate site as a Marine Protected Area

Option 2 involves the formal designation of the Sea of the Hebrides. Designation would provide recognition and protection to the natural features of the site while also contributing to the national and international MPA networks.

Sectors and groups affected

The following activities have been identified as present (or possibly present in the future) within the Sea of the Hebrides pMPA and potentially interact with one or more of the features:

Finfish Aquaculture
Shellfish Aquaculture
Coastal Protection

Commercial Fishing (GVA)
Ports and Harbours
Recreational Boating
Commercial Shipping
Telecommunication Cables

Affected sectors may be impacted to a greater or lesser degree by designation depending on which scenario is pursued and which management option is preferred. While the above sectors are all potentially operational within the site, not all will necessarily be impacted by designation and management measures.

Benefits

Option 1: Do nothing

No additional benefits are expected to arise from this policy option.

Option 2: Designate site as a Marine Protected Area

Designation will help to conserve the range of biodiversity in Scottish waters. It will complement other types of designation and provide an essential contribution to establishing an ecologically coherent network of MPAs. This would also safeguard the ecosystem services and benefits provided by the marine environment

Appropriate management will reduce the risk that the extent, population, structure, natural environmental quality and processes of features protected will decrease or degrade over time.

Contribution to an Ecologically Coherent MPA network

Scotland's seas support a huge diversity of marine life and habitats, with around 6,500 species of plants and animals, with plenty more to be found in the undiscovered depths of the north and west of Scotland. Our seas account for 61% of UK waters and remain at the forefront of our food and energy needs, through fishing, aquaculture, oil and gas, and new industries such as renewables, as well as recreation activities and ecotourism. It is likely that an MPA network will demonstrate beneficial effects greater than the sum of the benefits from the individual areas.

MPA designation will help to conserve the range of biodiversity in the Sea of the Hebrides and for Scotland as a whole, and will contribute to establishing an ecologically coherent network of marine protected areas.

Ecosystem services benefits

Ecosystems are very complex, and it is thought that the more complex an ecosystem is the more resilient it is to change. Therefore, if it is damaged or if a species or habitat is removed from that ecosystem, the chances of survival for those services reduce as the ecosystem becomes weaker. However, by conserving or allowing the species and habitats that make up that ecosystem to recover, we can be more confident of the continuation of the long-term benefits the marine environment provides.

Non-use value of the natural environment is the benefit people get simply from being aware of a diverse and sustainable marine environment even if they do not themselves ‘use it’. We

take for granted many of the things we read about or watch, such as bright colourful fish, reefs and strange shaped deep sea curiosities, to lose them would be a loss to future generations that will not be able to experience them. Due to the scientific uncertainty involved it is challenging to put a true value on this, but the high quality experience and increasing knowledge of Scotland's seas can be better preserved through measures such as MPAs. It is expected that non-use value will be attained as a result of designation both from the knowledge that the features are receiving adequate protection along with the wider conservation objectives that designation supports.

In the case of the Sea of the Hebrides, it is estimated that effective management of protected features may provide wider benefits over and above these non-use values society places on a healthy and productive marine environment.

Annex A summarises the ecosystem benefits that can be derived from designation of the Sea of the Hebrides.

Summary of Benefits
While it may not be possible with current levels of research to monetise benefits with a satisfactory degree of rigour, it is clear that many of the benefits relate to aspects of our lives that we take for granted and for which it is good practice and common sense to maintain through protection measures. These benefits include use values, such as recreational use of the marine environment, as well as non-use values, such as the value that people place on simply knowing that something exists, even if they will never see it or use it.

Kenter et al. examined the value of creating a network of marine protected areas in the UK. From the study it is estimated that, in 2019 prices, the total economic valuation of the Sea of the Hebrides site designation is £5.61 million, rising to £6.36 million when designation is accompanied by management measures[1].

Treating marine protected areas as a collection of individual and separate features providing separate ecosystem services potentially ignores any network effects that could occur from a set of MPAs. A number of adjacent marine reserves may demonstrate network effects, i.e. the benefit from the networks may be greater (or less) than the sum of the benefits from the individual MPAs. Kenter et al estimated total value of non-use benefits of designating all four sites as £28 million in 2019 prices.

Costs

Option 1: Do nothing

This option is not predicted to create any additional costs to the sectors and groups outlined above. However, it should be noted that the societal cost of not designating could be both large and irreversible relative to the current condition of the marine environment. The absence of management measures to conserve the identified features may produce future economic and social costs[2] in terms of increased marine habitat and biodiversity degradation. The option

[1] [1] Kenter, J.O., Bryce, R., Davies, A., Jobstvogt, N., Watson, V., Ranger, S., Solandt, J.L., Duncan, C., Christie, M., Crump, H., Irvine, K.N., Pinard, M. & Reed, M.S., (2013). The value of potential marine protected areas in the UK to divers and sea anglers. UNEP-WCMC, Cambridge, UK.

[2] This potentially large and irreversible societal cost avoided is presented within the benefits section of the 'do designate' scenario (option 2) to avoid double counting the same impact.

to not designate holds the potential to undermine the overall ecological coherence of the Scottish MPA Network.

Option 2: Designate site as a Marine Protected Area

Costs have been evaluated based on the implementation of potential management measures. Where feasible costs have been quantified, where this has not been possible costs are stated qualitatively. All quantified costs have been discounted in line with HM Treasury guidance using a discount rate of 3.5% to reflect preference for current consumption over future consumption.

Finfish aquaculture

There are currently 4 finfish aquaculture sites within the Sea of the Hebrides pMPA, and a further 2 finfish sites in a 1 km buffer around the site. Of these sites, five are within the Inner Hebrides and the Minches SAC. It is expected that finfish aquaculture in the Sea of the Hebrides pMPA will expand over the assessment period, and an assumption has been used below that there will be 9 applications for new or expanding sites every 10 years in Sea of the Hebrides. Of the sites in the Sea of the Hebrides pMPA it is assumed that all will currently use acoustic deterrent devices (ADDs) devices, intended to reduce predation of stocks by seals.

It is possible that there may be costs incurred as a result of potential future development in the area, with associated impacts on project delays, on consenting and on wider investment opportunities. Possible social impacts may flow from these economic costs; there may be reduced future employment opportunities if additional costs are significant and render development projects economically unviable or if delays arising from designation impact on potential investment opportunities. However, at this stage it is not possible to quantify these potential future impacts.

Economic Costs on the Activity of Designation of the Site as an MPA			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
Assumptions for cost impacts	▪ There will be 9 applications every 10 years in SOH (7 of which also overlap Inner Hebrides and the Minches cSAC). ▪ Additional assessment to support new applications will cost £5,600 per assessment; ▪ Development of and compliance with vessel management plan will cost £1,000 per new application.	▪ There will be 9 applications every 10 years in SOH (7 of which also overlap Inner Hebrides and the Minches cSAC). ▪ Additional assessment to support new applications will cost £5,600 per assessment; ▪ The additional cost of installing 50% cetacean friendly ADD is £11,500 per site ▪ Development of and compliance with vessel management plan will cost £1,000 per new application.	▪ There will be 9 applications every 10 years in SOH (7 of which also overlap Inner Hebrides and the Minches cSAC). ▪ Additional assessment to support new applications will cost £5,600 per assessment; ▪ Development of and compliance with vessel management plan will cost £1,000 per new application. ▪ The additional cost of installing antipredator nets is £48,000 per site. ▪ It is assumed that the cost associated with antipredator nets will be phased in associated with the replacement of end-of life ADDs.

Economic Costs on the Activity of Designation of the Site as an MPA			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
			▪ There is no additional cost due to restriction of vessel speeds to <6 knots in shark awareness zones
Description of one-off costs	▪ Additional assessment is required to assess the potential impact of new fishfarms on MPA features to support planning applications. Total cost = £22,400 ▪ Development of and compliance with vessel management plan. Total cost = £18,000	▪ Additional assessment is required to assess the potential impact of new fishfarms on MPA features to support planning applications. Total cost = £22,400 ▪ Development of and compliance with vessel management plan. Total cost = £18,000 ▪ Replacement of 50% of end of life ADD with cetacean / basking shark appropriate devices. Total cost = £250,000	▪ Additional assessment is required to assess the potential impact of new fishfarms on MPA features to support planning applications. Total cost = £22,400 ▪ Development of and compliance with vessel management plan. Total cost = £18,000 ▪ Restriction of vessel speeds to <6 knots in shark awareness zones. Total cost = £0 ▪ Replacement of ADD with antipredator nets. Total cost = £384,000
Description of recurring costs	▪ None.	▪ None.	▪ None.
Description of non-quantified costs	▪ Cost of uncertainty and delays in planning applications. ▪ Potential displacement of new aquaculture sites to areas outwith the pMPA	▪ Cost of uncertainty and delays in planning applications. ▪ Potential displacement of new aquaculture sites to areas outwith the pMPA	▪ Cost of uncertainty and delays in planning applications; and ▪ Micro-siting of installations to avoid sensitive features. ▪ Potential displacement of new aquaculture sites to areas outwith the pMPA
Quantified Costs on the Activity of Designation of the Site as an MPA (in £000s)			
Total costs (2019–2038)	40	290	424
Average annual costs	2	14	21
Present value of total costs (2019–2038)	29	198	300
Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.			

Shellfish aquaculture

There are currently 3 shellfish aquaculture sites within the Sea of the Hebrides pMPA, and a further 3 shellfish sites within a 1 km buffer around the site. Of these, three are within the Inner

Hebrides and the Minches SAC. It is expected that the shellfish aquaculture in the Sea of the Hebrides pMPA will expand over the assessment period, and an assumption has been used below that there will be 7 applications for new or expanding sites every 10 years in Sea of the Hebrides.

Economic Costs on the Activity of Designation of the Site as an MPA				
	Lower Estimate		**Intermediate Estimate**	**Upper Estimate**
Assumptions for impacts	▪ It has been assumed that there will be 7 new applications in SOH every 10 years. ▪ Additional assessment of the impact on MPA features from new sites will cost £5,600 per application. ▪ Development of and compliance with a vessel management plan associated with new applications will cost £1,000 per application.		▪ It has been assumed that there will be 7 new applications in SOH every 10 years. ▪ Additional assessment of the impact on MPA features from new sites will cost £5,600 per application. ▪ Development of and compliance with a vessel management plan associated with new applications will cost £1,000 per application.	▪ It has been assumed that there will be 7 new applications in SOH every 10 years. ▪ Additional assessment of the impact on MPA features from new sites will cost £5,600 per application. ▪ Development of and compliance with a vessel management plan associated with new applications will cost £1,000 per application. ▪ It is assumed that the restriction of vessel speeds within the shark awareness zones has no additional associated cost.
Description of quantified one-off impacts - (on-site)	▪ Additional assessment is required to assess the potential impact of new aquaculture sites on MPA features to support planning applications. Total cost = £78,000 ▪ Development of and compliance with vessel management plan. Total cost = £14,000		▪ Additional assessment is required to assess the potential impact of new aquaculture sites on MPA features to support planning applications. Total cost = £78,000 ▪ Development of and compliance with vessel management plan. Total cost = £14,000	▪ Additional assessment is required to assess the potential impact of new aquaculture sites on MPA features to support planning applications. Total cost = £78,000 ▪ Development of and compliance with vessel management plan. Total cost = £14,000
Description of quantified recurring impacts	N/A		N/A	N/A
Description of non-quantified impacts	On-site	Cost of uncertainty and delays	Cost of uncertainty and delays	Cost of uncertainty and delays
	Off-site	N/A	N/A	N/A
Quantified Costs on the Activity of Designation of the Site as an MPA (in £000s)				
Total costs (2019 to 2038)	92		92	92
Average annual costs	5		5	5
Present value of total	66		66	66

costs (2019 to 2038)			
Definitions of cost and economic impacts: Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.			

Coastal protection

The data currently available through the Eurosion database currently identifies no coastal protection assets within the site. However, it is thought that there are some areas of hard defence which are likely to require maintenance, and therefore assumptions made as summarised below.

In order to maintain protection from coastal erosion and flooding events, coastal protection assets require maintenance activities. Maintenance activities introduce the requirement for assessments in order to gain marine licences and planning permissions, which will need to be expanded to include the protected features of the site.

Economic Costs on the Activity of Designation of the Site as an MPA (2019-20138)				
		Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
Assumptions for impacts		▪ It has been assumed that there is one application every 5 years in SOH for maintenance of a coastal protection asset ▪ Additional assessment of the impact on MPA features from new sites will cost £5,600 per application.	▪ It has been assumed that there is one application every 5 years in SOH for maintenance of a coastal protection asset ▪ Additional assessment of the impact on MPA features from new sites will cost £5,600 per application.	▪ It has been assumed that there is one application every 5 years in SOH for maintenance of a coastal protection asset ▪ Additional assessment of the impact on MPA features from new sites will cost £5,600 per application.
Description of quantified one-off impacts - (on-site)		▪ Additional assessment is required to assess the potential impact of new coastal protection projects on MPA features to support planning applications. Total cost = £22,400	▪ Additional assessment is required to assess the potential impact of new coastal protection projects on MPA features to support planning applications. Total cost = £22,400	▪ Additional assessment is required to assess the potential impact of new coastal protection projects on MPA features to support planning applications. Total cost = £22,400
Description of quantified recurring impacts – (on-site)*		▪ n/a	▪ n/a	▪ n/a
	On-site	▪ n/a	▪ n/a	▪ n/a

Description of non-quantified impacts	Off-site	▪ n/a	▪ n/a	▪ n/a
Quantified Costs on the Activity of Designation of the Site as an MPA (in £000s)				
Total costs (2019–2038)		22	22	22
Average annual costs		1	1	1
Present value of total costs (2019–2038)		16	16	16
Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.				

Commercial fisheries

Sea of the Hebrides pMPA lies within nine ICES rectangles covering the Sea of the Hebrides, from the Isle of Mull in the south to Skye in the north and the Outer Hebrides to the west, in ICES Division VIa. Approximately 8,580 tonnes of fish and shellfish were landed from these ICES rectangles per annum (2012-2016), predominantly shellfish species by weight (over 50%) and value (over 75%). The main gear types were demersal trawls and creels.

VMS-based estimates and ICES rectangle landings statistics indicate that demersal trawls and mechanical dredges (over-12m vessels) and demersal trawls and creels (under-12m vessels) are the main gear types that operate within the Sea of the Hebrides pMPA. The value of landings from the pMPA was £9.5 million (over-12m vessels, from VMS data) and £12.9 million (under-12m vessels, indicated from ICES rectangle landings data) (annual average for 2012–2016, 2019 prices).

Vessels fishing in the Sea of the Hebrides pMPA predominantly operate from: Mallaig, Stornoway, Fraserburgh and Oban (over-12m vessels) and Portree, Stornoway and Oban (under-12m vessels).

Landings from the over-12m vessels were made predominantly into Mallaig (57 %), Oban (13 %) and Northbay (9 %). Landings from the under-12m vessels were made predominantly into Strathaird (18 %), Mallaig (11 %) and Dunvegan (10 %).

For the over-12m vessels, demersal trawls operated in particular across the eastern and central parts of the pMPA while creels operated mainly in the north-west and mechanical dredges operated in the south-east part of the pMPA. For the under-12m vessels, demersal trawls operated in particular in the northern part of the pMPA.

Economic Impacts arising from the Management Scenarios for the Site/Feature (over 2019 to 2038 inclusive)				
		Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
Assumptions for impacts		▪ Follow best practice for mobile bottom-contacting gear to minimise risk of bycatch of basking shark. ▪ Reduce risk of entanglement of basking shark and minke whale with static gear by following best practice. ▪ Reduce risk of entanglement of minke whale and basking shark with pelagic gear by following best practice. ▪ It is assumed these scenarios entail no extra cost on the industry.	▪ Follow best practice for mobile bottom-contacting gear to minimise risk of bycatch of basking shark. ▪ Reduce risk of entanglement of basking shark and minke whale with static gear by following best practice. ▪ Reduce risk of entanglement of minke whale and basking shark with pelagic gear by following best practice. ▪ Exclusion of hydraulic gear from sandeel habitat. ▪ Exclude targeted fishing for sandeels. ▪ Exclusion of drift nets and set nets between April and October in 'shark awareness zones'.	▪ Follow best practice for mobile bottom-contacting gear to minimise risk of bycatch of basking shark. ▪ Reduce risk of entanglement of basking shark and minke whale with static gear by following best practice. ▪ Reduce risk of entanglement of minke whale and basking shark with pelagic gear by following best practice ▪ Exclusion of hydraulic gear from sandeel habitat. ▪ Exclude targeted fishing for sandeels. ▪ Exclusion of drift nets and set nets between April and October across site. ▪ Limit herring and sprat fishing effort to current levels.
One-off impacts (on-site)		▪ None	▪ None	▪ None
Recurring impacts – cost impacts per fleet segment (annual values, £000s, 2019 prices) (on-site)*	**Under & Over-12m vessels** Suction dredges & set nets	▪ Loss of fishing income: 0.0	▪ Loss of fishing income: 2.4	▪ Loss of fishing income: 3.5
	Total all vessels	**0.0**	**2.4**	**3.5**
Description of non-quantified impacts	On-site	▪ None	▪ None	▪ None
	Off-site	▪ None	If activity is displaced rather than lost, there is potential for: ▪ Additional abrasion ▪ Potential for gear conflict ▪ Additional impacts on species outside of site	If activity is displaced rather than lost, there is potential for: ▪ Additional abrasion ▪ Potential for gear conflict ▪ Additional impacts on species outside of site

			▪ Potential changes to vessel costs/revenues	▪ Potential changes to vessel costs/revenues

Unlike most other sectors, the potential cost of designation on commercial fisheries is a loss or displacement of current (and future) output, caused by restrictions on fishing activities. Any decrease in output will, all else being equal, reduce the Gross Value Added (GVA) generated by the sector and have knock-on effects on the GVA generated by those industries that supply commercial fishing vessels. The costs estimates for this sector have therefore been estimated in terms of GVA, which more accurately reflects the wider value of the sector to the local area and economy beyond the market value of the landed catch.[3] Costs are presented in terms of the reduction in full-time equivalent (FTE) employment. It is also possible that effort not continuing in the area could be transferred to other locations resulting in no or reduced loss of income.

GVA estimates have been generated by applying fleet segment-specific 'GVA/total income' ratios to the value of landings affected. The GVA ratios have been calculated using data on total income and GVA from the Sea Fish Industry Authority Multi-year Fleet Economic Performance Dataset (published Sept 2014). Further details on the GVA ratios and the methodology for estimating GVA and employment impacts applied are presented in Appendix C.

It is important to note that all costs presented below assume that all affected landings are lost; that there is no displacement of fishing activity to alternative fishing grounds. In reality, some displacement is likely to occur and hence the cost, GVA and employment impacts presented in this table are likely to overestimate costs.

Quantified Costs on the Activity of Designation of the Site as an MPA (£Million)			
	Low	Intermediate	High
Total change in GVA (2014–2033)	0.0	21.7	33.7
Average annual change to GVA	0.0	1.1	1.7
Present value of total change in GVA (2019–2038)	0.0	15.9	24.8
Direct and Indirect reduction in Employment	0.0	0.0	0.1

[3] Stating costs purely in terms of landed value would overstate the true economic cost of not fishing. If fishermen are prevented from catching fish they forgo the landed value of those fish but subsequently forgo the payment of intermediate costs such as fuel (it is assumed that no fishing activity is displaced).

The results presented here represent a 'worst case' scenario for each scenario. In reality vessels are likely to react to any management measures in place in order to maintain profitability (i.e. by changing target species/gear type). Displacement could well negate some of the cost impacts stated above (i.e. by fishing 'elsewhere'), but conversely could also add to them (i.e. the extra fuel cost associated with fishing 'elsewhere'). This uncertainty is the reasoning behind not attempting to quantify this cost impact. Other non-quantified costs include: potential conflict with other fishing vessels, environmental consequences of targeting new areas, longer steaming times and increased fuel costs, changes in costs and earnings, gear development and adaptation costs, and additional quota costs.

Ports and harbours

There are 11 minor ports and harbours within or within a 1 km buffer of the Sea of the Hebrides pMPA (Baile Mor, Canna, Coll, Fionnphort, Galmisdale (Eigg), Hynish (Tiree), Meanish (Loch Pooltiel), Port Mor (Muck), Scarinish (Tiree), Milton (Tiree) and Gott Bay (Tiree)). Of these, six are within the Shark Awareness Zones, but of the six only Canna, Coll and Gott Bay (Tiree) are of sufficient size to issue notices to mariners.

It should be noted that additional cost impacts could arise as a result of consenting delays. The cost impacts and uncertainty associated with MPA designation may affect investor confidence.

Economic Costs on the Activity of Designation of the Site as an MPA			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
Assumptions for cost impacts	▪ New development proposals affecting MPAs will require additional assessment of impacts to protected features; ▪ Additional assessment costs are estimated to be £7,600 (at 2019 prices) per licence application; ▪ Costs are incurred by all major ports within 5km of new MPAs or all non-major ports within 1km of new MPAs; and ▪ All major ports submit development applications every 5 years starting in 2021 and all other ports submit development applications every 20 years starting in 2029.	▪ New development proposals affecting MPAs will require additional assessment of impacts to protected features; ▪ Additional assessment costs are estimated to be £7,600 (at 2019 prices) per licence application; ▪ Costs are incurred by all major ports within 5km of new MPAs or all non-major ports within 1km of new MPAs; and ▪ All major ports submit development applications every 5 years starting in 2021 and all other ports submit development applications every 20 years starting in 2029.	▪ New development proposals affecting MPAs will require additional assessment of impacts to protected features; ▪ Additional assessment costs are estimated to be £7,600 (at 2019 prices) per licence application; ▪ Costs are incurred by all major ports within 5km of new MPAs or all non-major ports within 1km of new MPAs; and ▪ All major ports submit development applications every 5 years starting in 2021 and all other ports submit development applications every 20 years starting in 2029. ▪ The cost to a port or harbour within the shark awareness zones

Economic Costs on the Activity of Designation of the Site as an MPA			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
			to issue a Notice to Mariners is assumed to be £1,000.
Description of one-off costs	▪ Additional assessment cost for development of major ports. Total cost = £0 ▪ Additional assessment cost for development of minor ports. Total cost = £84,000	▪ Additional assessment cost for development of major ports. Total cost = £0 ▪ Additional assessment cost for development of minor ports. Total cost = £84,000	▪ Additional assessment cost for development of major ports. Total cost = £0 ▪ Additional assessment cost for development of minor ports. Total cost = £84,000 ▪ Cost to ports or harbours of issuing Notice to Mariners for speed restrictions in shark awareness zones. Total cost = £3,000
Description of recurring costs	n/a	n/a	n/a
Description of non-quantified costs	n/a	n/a	n/a
Quantified Costs on the Activity of Designation of the Site as an MPA (in £000s)			
Total costs (2019–2038)	84	84	87
Average annual costs	4	4	4
Present value of total costs (2019–2038)	59	59	62
Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.			

Recreational boating

There is a high density of recreational boating within the Sea of the Hebrides pMPA, concentrated near the coastline, with facilities and stopping points for recreational yachts within the site, including RYA clubs and training facilities on Coll and Tiree, within the shark awareness zone.

Economic Costs on the Activity of Designation of the Site as an MPA			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
Assumptions for cost impacts	0	0	▪ It has been assumed that the cost to the RYA for disseminating data regarding shark awareness zones is £1,000.

Economic Costs on the Activity of Designation of the Site as an MPA			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
Description of one-off costs	0	0	▪ Cost of disseminating information regarding speed restrictions. Total cost = £1,000
Description of recurring costs	0	0	0
Description of non-quantified costs	0	0	0
Quantified Costs on the Activity of Designation of the Site as an MPA (in £000s)			
Total costs (2019–2038)	0	0	1
Average annual costs	0	0	0
Present value of total costs (2019–2038)	0	0	1
Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.			

Commercial shipping

There is some commercial shipping activity throughout the Sea of the Hebrides pMPA. This activity includes considerable numbers of lifeline ferry transits connecting mainland Scotland to the Hebrides, alongside ships transiting through the Minches, where an International Maritime Organisation (IMO) traffic separation scheme (TSS) is in place to manage the high density of traffic in the region. Traffic through the area of the shark awareness zone is dominated by ferry routes, which are excluded from management scenarios, with small amounts of additional traffic transiting through the regions.

Economic Costs on the Activity of Designation of the Site as an MPA			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
Assumptions for cost impacts	No additional cost	No additional cost	It has been assumed that, given the low level of transits, and the exclusion of ferries from the management measure, there is no significant impact on shipping traffic from the <6 knots speed restriction. It has been assumed that the cost to the UKHO to integrate the speed restrictions onto nautical charts is £1,000.

Economic Costs on the Activity of Designation of the Site as an MPA			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
Description of one-off costs	0	0	Cost to UKHO to update nautical charts. Total cost = £1,000
Description of recurring costs	0	0	0
Description of non-quantified costs	0	0	0
Quantified Costs on the Activity of Designation of the Site as an MPA (in £000s)			
Total costs (2019–2038)	0	0	1
Average annual costs	0	0	0
Present value of total costs (2019–2038)	0	0	1
Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.			

Power interconnectors

There are no power interconnectors currently located within the Sea of the Hebrides pMPA. There is one project identified for potential development over the assessment period (Western Isles HVDC, potentially due for construction in 2021) which crosses the site. This project will require additional assessments to support planning applications (including marine licence) and regular survey to support operation and maintenance following construction.

Economic Costs on the Activity of Designation of the Site as an MPA			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
Assumptions for cost impacts	▪ It has been assumed that the additional assessment required to include MPA features is £5,600 for each application. ▪ It has been assumed that the Western Isles HVDC connection is the only proposed connection in SOH during the assessment period.	▪ It has been assumed that the additional assessment required to include MPA features is £5,600 for each application. ▪ It has been assumed that the Western Isles HVDC connection is the only proposed connection in SOH during the assessment period.	▪ It has been assumed that the additional assessment required to include MPA features is £5,600 for each application. ▪ It has been assumed that the Western Isles HVDC connection is the only proposed connection in SOH during the assessment period. ▪ It will take 3 days of survey effort to survey a 12 nm section of cable within the MPA ▪ The restriction on survey effort to Nov-April is assumed to double the amount of time required to undertake the survey

Economic Costs on the Activity of Designation of the Site as an MPA			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
			(3 days of survey effort will take on average 8 days in winter, 4 in summer i.e. an additional 4 days downtime). ▪ The cost of an additional day (generally weather down-time) is assumed to be £10,000. ▪ It is assumed that the Western Isles HVDC will require survey annually following construction in 2021.
Description of one-off costs	Cost of additional assessment for proposed interconnector projects transecting sites. Total cost = £5,600	Cost of additional assessment for proposed interconnector projects transecting sites. Total cost = £5,600	Cost of additional assessment for proposed interconnector projects transecting sites. Total cost = £5,600
Description of recurring costs	n/a	n/a	n/a
Description of non-quantified costs	Cost of uncertainty and delays to licence applications	Cost of uncertainty and delays to licence applications	Cost of uncertainty and delays to licence applications
Quantified Costs on the Activity of Designation of the Site as an MPA (in £000s)			
Total costs (2019–2038)	6	6	686
Average annual costs	0	0	34
Present value of total costs (2019–2038)	6	6	478
Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.			

Telecommunication cables

There are two telecommunication cables which transit through Sea of the Hebrides (BT-HIE Seg1.17 and BT-HIE Seg1.15) totalling approximately 65 km of length within the site. These link mainland Scotland with the Hebridean islands of Tiree and Uist.

Economic Costs on the Activity of Designation of the Site as an MPA			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
Assumptions for cost impacts	▪ It has been assumed that the cost associated with additional	▪ It has been assumed that the cost associated with additional	▪ It has been assumed that the cost associated with additional

Economic Costs on the Activity of Designation of the Site as an MPA			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
	assessment to support planning applications is £5,600 in 2019 prices. ▪ It has been assumed that the cable is replaced during the assessment period.	assessment to support planning applications is £5,600 in 2019 prices. ▪ It has been assumed that the cable is replaced during the assessment period.	assessment to support planning applications is £5,600 in 2019 prices. ▪ It has been assumed that the cable is replaced during the assessment period.
Description of one-off costs	Cost of additional assessment. Total cost = £5,600	Cost of additional assessment. Total cost = £5,600	Cost of additional assessment. Total cost = £5,600
Description of recurring costs	N/A	N/A	N/A
Description of non-quantified costs	N/A	N/A	N/A
Quantified Costs on the Activity of Designation of the Site as an MPA (in £000s)			
Total costs (2019–2038)	6	6	6
Average annual costs	0	0	34
Present value of total costs (2019–2038)	4	4	4
Total costs = Sum of one-off costs and recurring costs for the site summed over the 20 year period. Average annual costs = Total costs divided by the total number of years under analysis (i.e. 20). Present value of total costs = Total costs discounted to their current value, using a discount rate of 3.5%.			

Public sector

The decision to designate the Sea of the Hebrides as an MPA, would result in costs being incurred by the public sector in the following areas:

- Preparation of Statutory Instruments
- Development of voluntary instruments
- Site monitoring
- Compliance and enforcement
- Promotion of public understanding

Regulatory and advisory costs associated with licensing decisions

The majority of these costs will accrue at the national level and as such have not been disaggregated to site level. Only the preparation of Statutory Instruments and regulatory and advisory costs associated with licensing decisions have been estimated at the site level

Site-specific Public Sector Costs (£Million, 2019-2038)			
	Lower Estimate	**Intermediate Estimate**	**Upper Estimate**
Preparation of Statutory Instruments	0	0.0042	0.0042
Preparation of a Management Scheme	0.0278	0.0278	0.0278
Promotion of Voluntary Measures	0.0042	0.0042	0.0042
Monitoring of Protected Features	0.324	0.324	0.324

Review of Assessments (PV)	0.018	0.018	0.018
Total Quantified Public Sector Costs	0.374	0.378	0.378
Average annual costs	0.019	0.019	0.019
Present value of total costs (2019 to 2038)	0.285	0.289	0.289

Total costs

Total quantified costs are presented in present value terms. Commercial fisheries costs are presented in terms of GVA.

Total Present Value of Quantified Costs (£Million, 2019-2038)			
	Lower Estimate	Intermediate Estimate	Upper Estimate
Finfish Aquaculture	0.029	0.198	0.3
Shellfish Aquaculture	0.066	0.066	0.066
Coastal Protection	0.016	0.016	0.016
Ports and Harbours	0.059	0.059	0.062
Recreational Boating	0	0	0.001
Commercial Shipping	0	0	0.001
Telecommunication Cables	0.004	0.004	0.004
Total Quantified Economic Costs	**0.175**	**0.344**	**0.451**

GVA Impacts (£million 2019-2038)			
Commercial Fisheries	0	0.016	0.025

Total Non-Quantified Costs			
Scenario	**Low**	**Intermediate**	**Upper**
Sector/Group			
Finfish Aquaculture	▪ Cost of uncertainty and delays • Potential displacement of new aquaculture sites to areas outwith the pMPA	▪ Cost of uncertainty and delays • Potential displacement of new aquaculture sites to areas outwith the pMPA	▪ Cost of uncertainty and delays • Potential displacement of new aquaculture sites to areas outwith the pMPA
Shellfish Aquaculture	Cost of uncertainty and delays	Cost of uncertainty and delays	Cost of uncertainty and delays
Commercial Fisheries	None	• If activity is displaced rather than lost, there is potential for: ▪ Additional abrasion ▪ Gear conflict. ▪ Additional impacts on	• If activity is displaced rather than lost, there is potential for: ▪ Additional abrasion ▪ Gear conflict. ▪ Additional impacts on

		species outside of site. ▪ Changes to vessel costs/revenues.	species outside of site. ▪ Changes to vessel costs/revenues.
Power Interconnectors	Cost of uncertainty and delays to licence applications	Cost of uncertainty and delays to licence applications	Cost of uncertainty and delays to licence applications

Scottish Firms Impact Test

This section will be informed by evidence gathered during the consultation phase, and completed in the final BRIA. In addition to the written consultation process there will be meetings with a number of businesses who may be affected by the proposal.

Many of the businesses affected may include some small and micro-sized firms. For the commercial fisheries sector the average number of fishers per Scottish vessel in 2017 was 2.3. Additional costs imposed by the designation of the Sea of the Hebrides as an MPA have the potential to fall on small businesses.

- **Competition Assessment**

Designation of the Sea of the Hebrides as an MPA may affect marine activities where businesses operate within a given spatial area or require a spatial licence for new or amended operations. At the Sea of the Hebrides pMPA such activities include:

Aquaculture – finfish and shellfish farms
Commercial fishing

There is a varying degree to which competitiveness may be affected, depending on the management. However it is not possible to quantify this, but it is expected that the most likely scenario would have little impact on competitiveness of the industries, given current consent and licensing requirements that will already be taking account of the features for which the MPA is proposed.

Competition Filter Questions
Will the proposal directly limit the number or range of suppliers? e.g. will it award exclusive rights to a supplier or create closed procurement or licensing programmes?

No. It is unlikely that designation of the Sea of the Hebrides as an MPA will directly limit the number or range of suppliers.

Will the proposal indirectly limit the number or range of suppliers? e.g. will it raise costs to smaller entrants relative to larger existing suppliers?

Limited / No Impact. Designation of the Sea of the Hebrides as an MPA could affect the spatial location of commercial fisheries activity and may restrict the output capacity of this sector. However, restrictions on fishing locations may well be negated by displacement i.e.

vessels fishing elsewhere. It is expected that the distribution of additional costs will be felt more by larger existing suppliers than smaller entrants.

Designation could affect the preparation of applications, location of marine developments and activities, or requirements for marine developments which would apply to any developer of an affected licensed activity when preparing and submitting an application. Additional costs will potentially be incurred by developers submitting new licence applications, but they will apply to both new entrants and to incumbents looking to expand or alter their operations.

Will the proposal limit the ability of suppliers to compete? e.g. will it reduce the channels suppliers can use or geographic area they can operate in?

No. Designation of the Sea of the Hebrides as an MPA will not directly affect firms' route to market or the geographical markets they can sell into.

Will the proposal reduce suppliers' incentives to compete vigorously? e.g. will it encourage or enable the exchange of information on prices, costs, sales or outputs between suppliers?

No. Designation of the Sea of the Hebrides as an MPA is not expected to reduce suppliers' incentives to compete vigorously.

Test run of business forms

It is not envisaged that designation of the proposed Sea of the Hebrides as an MPA will result in the creation of new forms for businesses to deal with, or result in amendments of existing forms.

Legal Aid Impact Test

It is not expected that the pMPA will have any impact on the current level of use that an individual makes to access justice through legal aid or on the possible expenditure from the legal aid fund as any legal/authorisation decision impacted will largely affect businesses rather than individuals.

Enforcement, sanctions and monitoring

Responsibility for compliance, monitoring and enforcement of the provisions will be carried out by Marine Scotland. Reserved issues will continue to be addressed by the respective departments within the UK government. The Plan will be delivered through the existing marine licensing system, nature conservation measures, in addition to Scottish Planning Policy and other licensing/consenting frameworks. Enforcement and authorisation decisions within these frameworks carried out by public authorities must have regards to new MPAs, these include: local authorities, Crown Estate Scotland, port and harbour authorities and terrestrial planning authorities.

Implementation and delivery plan

If designated, public bodies will have to take any authorisation or enforcement decisions in accordance with the provisions defined in legislation to protect MPAs. If specific management measures are require for the site they will be developed and be subject of their own assessments, consultation, and implementation phase. The MPA network will be reviewed every six years to ensure that they are meeting, or are capable of meeting, the agreed conservation objectives and whether any additional management is likely to be required.

Summary and recommendation

To be updated when Final BRIA is published

Declaration and publication

I have read the Business and Regulatory Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) that the benefits justify the costs. I am satisfied that business impact has been assessed with the support of businesses in Scotland.

Signed:

Date:
07 Jun. 19

Mairi Gougeon, Minister for Rural Affairs and the Natural Environment

Scottish Government Contact Point:

marine_conservation@gov.scot

Summary of Ecosystem Services Benefits arising from the Designation and Management of the Site as an MPA (2019 – 2038)									SOH
Services	**Relevance to Site**	**On-site / Off-site**	**Baseline Level**	**Estimated Impacts of Management**			**Value Weighting**	**Scale of Benefits**	**Confidence**
				Lower	**Intermediate**	**Upper**			
Fish and shellfish for human consumption	Moderate, benthic habitat and sandeels contribute to the food web	On-site and off-site	Stocks not at MSY	Nil		Minimal, small recovery of fish stocks possible	Moderate, sandeels are import in food webs for commercial species and priority wildlife species	Minimal	Moderate
Fish and shellfish for non-human consumption			Stocks reduced from potential maximum						
Climate regulation	Moderate, in coastal areas	On-site	Function of carbonate production areas may decline	Minimal		Minimal–Low, from prevention of damage to carbonate production areas	Moderate	Nil	High
Waste breakdown/ detoxification	Moderate, some biogenic benthic features (e.g. sea fans) provide this service	On-site and off-site	Low	Minimal			Low, water quality in this area not affecting human welfare	Nil	High
Non-use value of natural environment	Moderate, Basking shark, Minke whale and sandeels, and contribution of the site to MPA network, have non-use value	On-site	Non-use value of the site may decline	Moderate–Low, protection of features of site from potential future decline, but parts of site already protected			Moderate, protection of features is valued by divers & anglers (Kenter *et al*. 2013).	Moderate	Moderate, extent of features, responses to management scenarios, and value to society all uncertain
					Low, recovery of features possible				
Recreation	Moderate, wildlife tourism and recreation at site, including angling	On-site	Recreation value of the site may decline	Minimal, protection of features of site	Low, protection of features of site that contribute to recreation, allowing some recovery		Moderate–High, recreation and tourism support jobs,	Low–Moderate	Low–Moderate, extent of change from management

Summary of Ecosystem Services Benefits arising from the Designation and Management of the Site as an MPA (2019 – 2038)									SOH
Services	**Relevance to Site**	**On-site / Off-site**	**Baseline Level**	**Estimated Impacts of Management**			**Value Weighting**	**Scale of Benefits**	**Confidence**
				Lower	**Intermediate**	**Upper**			
	(Kenter *et al*. 2013)						and are valued (Kenter *et al*. 2013).		scenarios uncertain.
Research and Education	Moderate, small number of biological features have research value, but there are substitutes	On-site	Value of site may decline	Minimal, protection of features of site	Low, protection of key characteristics of site from decline, improving future research opportunities.		Low, for individual features. Moderate for opportunity to understand response of range of features to management.	Low	Low–Moderate, extent to which research uses site in future uncertain.
				Designation may play role in communicating management needs.					
Total value of changes in ecosystem services			Value of site may decline	Minimal for lower scenario, Low for intermediate and upper scenario, designation has Moderate–Low non-use value to protecting site from future decline (Kenter *et al*. 2013)				Low–Moderate	Moderate
Total value of changes in ecosystem services				**Low–Moderate**					**Moderate**