Title: Poble Bank Reef Special Area of Conservation	Impact Assessment (IA)		
IA No:	Date: 12/09/2012		
Lead department or agency:	Stage: Development/Options		
Marine Scotland	Source of intervention: EU		
Joint Nature Conservation Committee (JNCC)	Type of measure: Secondary legislation		
Scottish Natural Heritage	Contact for enquiries: Katherine Ross Frin.Ross@jncc.gov.uk 01224 266588		
Summary: Intervention and Options	RPC Opinion: RPC Opinion Status		

	Cost of Preferred (or more likely) Option									
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANCB on 2009 prices)	In scope of One-In, One-Out?	Measure qualifies as						
£m	£m	£m	No	NA						

What is the problem under consideration? Why is government intervention necessary?

Anthropogenic pressures are causing the decline of many marine habitats and species. Intervention is needed in to manage activities in key areas for important species and habitats, and to promote a healthy, resilient marine environment that underpins the sustainable delivery of ecosystem services. JNCC have assessed this site against the Habitats Directive Annex III selection criteria and advised the Scottish Government that it is eligible for identification as a 'Site of Community Importance' and should therefore be transmitted to the European Commission as required under Reg 7 of the Offshore Marine Conservation Regulations 2007 (amended).

What are the policy objectives and the intended effects?

The EC Directive 92/43/EEC on the conservation of natural habitats and wild flora and fauna (the Habitats Directive, 1992; and the Habitat Regulations, 1994) aims to protect biodiversity. This Directive requires the UK to propose sites hosting habitat types and species in need of conservation (as listed in the Directive), which are eligible for identification as Sites of Community Importance and designation as Special Areas of Conservation (SACs). The UK is required to establish conservation measures for sites designated as SACs by managing potentially damaging activities where the habitats and species are present and in their vicinity. 'Reefs' (Habitat 1170 in Annex I) are the qualifying feature of Pobie Bank Reef.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

Baseline: Do nothing, that is do not designate the site.

Option 1: Propose the site to the EC for designation. This is the preferred option as it will contribute towards conserving habitat of European importance along with its typical species located in UK waters. The option to search for an alternative site has not been considered further here because alternative sites of a similar type are not currently known to exist (possible alternatives were considered in the scoping stage but not recommended on scientific grounds). Though the site could be conserved under voluntary agreements or a national designation this would not contribute to fulfilling the requirements of the Habitats Directive.

As the measure follows an EU directive, it is exempt from OIOO and moratorium on small businesses.

Will the policy be reviewed? It will be reviewed. If applicable, set review date: 01/2019									
Does implementation go beyond minimum EU requirements? No									
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	Micro No	< 20 Yes	Small No	Large No					
What is the CO_2 equivalent change in greenhouse gas emissi (Million tonnes CO_2 equivalent)	Traded: na	Nor na	-traded:						

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Date:

Summary: Analysis & Evidence

Description:

FULL ECONOMIC ASSESSMENT

Price Base PV Bas		se	Time Period		Net Benefit (Present Value (PV)) (£m)					
Year 2011	Year 2	011	Years 10	Low: n	a High: na		Best Estimate:			
COSTS (£r	n)		Total Tra	nsition		Average Annual	Тс	otal Cost		
<u>`</u>	•	(Constant Price)		Years	(excl. Tran	sition) (Constant Price)	(Prese	ent Value)		
LOW			0.699			0.012		0.691		
High Reat Fatimet	-		0.699			0.136		1.514		
Best Estimat	e and and		0.699	oto hu in	nain offecte	na.		na.		
Low: Administration, enforcement and monitoring (£669k and £12k .pa); High: Administration, enforcement and monitoring (£669k and £12k .pa); Lost profitability for fisheries (£124 k. pa)										
Other key no High: some f	Other key non-monetised costs by 'main affected groups' High: some fishermen exit sector, knock-on effect to local economy of costs to fishermen.									
BENEFITS (£m)		Total Tra (Constant Price)		nsition Years	(excl. Tran	Average Annual sition) (Constant Price)	Tota (Prese	l Benefit ent Value)		
Low			Optional			Optional		Optional		
High			Optional			Optional	nal Optio			
Best Estimat	е		Unquantified			Unquantified	Unqu	uantified		
Description and scale of key monetised benefits by 'main affected groups' It has not been possible to monetise the benefits because the benefits are not traded and cannon be easily quantified.										
Other key non-monetised benefits by 'main affected groups' Restoration of reef habitats and associated biological communities. Low to moderate beneficial impacts on: fish stocks; non-use values of the natural environment; and for scientific ressearch. Benefits for the sustainable delivery of esystem services beyond the next 10 yrs. Important wider network and strategic benefits on biodiversity through the Natura suite of marine SACs.										
Key assumpti	ons/sens	sitivities	s/risks				Discount rate (%)	3.5		
Managemen for analysis. avoid damag SACs not de through the	Key assumptions/sensitivities/risks Discount rate (%) 3.5 Management measures for site are not known before designation so a realistic range of measures is used for analysis. If site is not designated condition of the habitats could deteriorate. Formal mechanisms to avoid damage to the habitats are weaker if site is not designated. Risk of infraction if suite of proposed SACs not designated. Benefits could be jeopardised if appropriate fisheries management not agreed through the CFP or properly enforced. Risk of cumulative economic impacts of MPAs									
BUSINESS AS	SESSM	ENT (Option 1)							

Direct impact on bus	iness (Equivalent Annua	In scope of OIOO?	Measure qualifies as	
Costs: 0 - 0.09	Benefits: na	Net:	No	NA

CONTENTS

1	INT	TRODUCTION	1
	1.1 1.2	 Purpose Policy drivers a) Habitats Directive b) UK identification of Annex I reef sites c) Conservation objectives and management of sites	1 1 2 3
	1.3	Background information on the Impact Assessment	3
2	BA	CKGROUND INFORMATION ON THE SITE	4
	2.1 2.2	Baseline Characteristics of the site	4 4
	2.3	Vulnerability of the site to human impacts	6
	2.4	Human activity and regulation of activity at the site	8
		a) Oil and gas	9
		b) Renewables	9
		c) Shipping	10
		d) Cables	11
		An inactive cable runs through the north of this site. No active telecommunications	
		infrastructure currently passes through or is known to be planned for the site	11
		e) Fisheries	11
2	A D		40
3	AP	PROACH TO ANALYSIS OF COSTS AND BENEFITS	18
	3.1	Approach	18
	3.2	Costs	19
		a) Policy costs to the private sector	19
		b) Administration costs to the private sector	19
	0.0	c) Costs to the public sector	19
	3.3	Benefits	20
4	СС	OSTS AND BENEFITS OF OPTION 1: DESIGNATE THE SITE	20
	<u>4</u> 1	Implications of designation	20
	4.1	Costs	20
	1.2	a) Shipping	21
		b) Fisheries	21
		c) Administration costs to Government	23
	4.3	Benefits of designating the site	24
		a) Provisioning services	24
		b) Regulating services	24
		c) Types of value	24
		d) Benefits to economic activity	27
	4.4	Summary of costs and benefits	27
	4.5	Impact tests	29
		a) Competition assessment	29
		b) Small firms impact test	30
		c) Legal aid	30
		a) Carbon assessment	30
		e) Kurai proofing	30
			30
5	СС	DNCLUSIONS	30
6	PF	FERENCES	21
J			

LIST OF FIGURES

Figure 2.1	Map of Pobie Bank Reef pSAC5	
Figure 2.2	ICES rectangles relating to Pobie Bank Reef pSAC12	

LIST OF TABLES

Table 2.1	Sensitivity, exposure and vulnerability of the Pobie Bank Reef	7
Table 2.2	Fisheries landings 2006-10 from the ICES rectangles containing Pobie Bank Reef pSAC .	.13
Table 2.3	Fisheries landings by vessel nationality	.13
Table 2.4	Fisheries landings divided by gear type	.14
Table 2.5	Fisheries landings by port of landing	.15
Table 2.6	Fisheries landings by target species	.16
Table 4.1	Summary of the "minimum" and "maximum" management scenarios	.21
Table 4.2	Summary of "minimum" and "maximum" management scenarios and assumptions	.22
Table 4.3	Potential significance of ecosystem services improvements for Pobie Bank Reef pSAC	.26
Table 4.4	Summary costs and benefits table for Option 1: Designate the site	.28
Table 4.5	Competition assessment for Pobie Bank Reef pSAC	.29

ANNEXES

ANNEX I	CALCULATIONS OF COSTS TO FISHING INDUSTRY BY GEAR TYPE
ANNEX II	COSTS BY SECTOR OF DESIGNATION

1 INTRODUCTION

1.1 Purpose

Within Europe natural habitats are continuing to deteriorate and an increasing number of wild species are seriously threatened by human activities. The main aim of the European Habitats Directive¹ is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species to a 'Favourable Conservation Status', introducing robust protection for those habitats and species of European importance.

This Impact Assessment (IA) addresses the recommendation by the Joint Nature Conservation Committee (JNCC) and Scottish Natural Heritage (SNH) for designation of a Special Area of Conservation (SAC), in offshore and inshore waters, at Pobie Bank Reef for its Reef habitat (Habitat H1170 in Annex I of the Habitats Directive).

Many of our marine habitats have been altered or damaged by human activities such as fishing, dredge disposal and oil and gas extraction (Eastwood 2007). Currently only 6% of the UK's marine environment is protected for conservation² and many offshore habitats are not protected. Additional management is needed to maintain and restore the healthy structure and function of such ecosystems, while permitting environmentally sustainable industries.

This IA informs the Scottish Government of the impacts that designating the site could have on the UK economy and the site's potential environmental and social effects. It should not inform the decision to designate the site (that decision is based on the site's Selection Assessment Document) because under the Habitats Directive, economic or social impacts should not influence selection of SACs or delineation of their boundaries. However, information provided on the type and level of activities taking place in and near the site may inform management measures for the site.

1.2 Policy drivers

a) Habitats Directive

Member States of the Council of Europe are committed to the Convention on the Conservation of European Wildlife and Natural Habitats³. The Wild Birds Directive⁴ and Habitats Directive provide the framework within which the provisions of the Bern Convention are applied in the European Union. The Habitats Directive aims to conserve natural habitats and species that are considered to be most in need of conservation at a European level (which are listed in Annex I and Annex II of the Directive respectively). Habitats have been included in Annex I because they are either in danger of disappearing within their natural range, have a small natural range, or they present outstanding examples of typical characteristics of the biogeographical regions listed in the Directive. The Habitats Directive not only aims to conserve the habitats but also their typical species. The UK (as a Member State) is required to take measures to maintain or restore Favourable Conservation Status⁵ of these natural habitats and to introduce robust protection for their future existence.

Under the Habitats Directive, habitats and species are to be protected by a coherent European ecological network of sites (called Natura 2000) identified by the European Commission (EC) from lists of national sites proposed by each Member State. The network of sites will enable habitat types to be maintained at, or restored to, favourable conservation status within their natural range. Once adopted in the Natura 2000 network by the EC the sites are designated by Member States as SACs.

¹ Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna

² JNCC marine protected area information http://jncc.defra.gov.uk/page-5201 [Accessed 06/01/2012].

³ The Bern Convention , Bern, 1979,

⁴ Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds

⁵ Favourable conservation status is defined for a feature as the 'natural range and area it covers is increasing, and the specific structure and functions which are necessary for its long term maintenance exist and are likely to exist for the foreseeable future, and the conservation status of its typical species is favourable'.

The Conservation of Habitats and Species (Natural Habitats, & c.) Regulations 1994 (as amended), and The Offshore Marine Conservation (Natural Habitats, & c.) Regulations 2007 (as amended) transpose the Habitats Directive (92/43/EEC) and Wild Birds Directive (2009/147/EC) into national law (hereafter these regulations have been referred to jointly as "the habitats regulations"). Together these regulations apply to inshore waters and the UK's offshore marine area which covers waters beyond 12 nautical miles – within British Fishery Limits – and the seabed and subsoil of the UK Continental Shelf Designated Area. The Offshore Habitats Regulations enable the UK to comply with European law beyond inshore waters and ensure that activities regulated by the UK that have an effect on important species and habitats in the offshore marine environment can be managed. Under the Regulations, 'Competent Authorities' that have functions relevant to marine conservation in the offshore marine area, have a general duty to secure compliance with the EC Habitats and Wild Birds Directives.

The Habitats Directive provides site selection criteria within Annex III. These criteria evaluate:

- The degree of representativeness of the natural habitat at the site in question;
- The area of the site in relation to the area of that habitat type within the national territory;
- The degree of conservation of the structure and functions of the habitat type (including restoration possibilities); and
- A global assessment of the conservation value of the site for that habitat type.

JNCC is responsible for providing scientific advice to the UK Government and the Devolved Administrations on nature conservation matters, including on the selection of SAC sites in the UK offshore marine area under the Offshore Habitats Regulations. In offshore waters off Scotland that advice is provided to Scottish Ministers. SNH provides this advice for marine SACs within 12nm of the coast.

The European Commission will assess whether the list of proposed SACs submitted to it by UK Government to them is sufficient or not. JNCC has worked to provide the best estimate of whether the UK's sites submitted so far will be sufficient in terms of both representing the habitat across its natural range, and also in proportion to the amount of that habitat type within UK waters⁶.

There are currently 102 SACs with marine components, covering 5% of the UK sea area. JNCC concluded that if at least one example of each Annex I habitat sub-type in offshore waters in each of the UK's Regional Seas⁷ were included in the SAC network that would ensure minimum representation of each Annex I habitat within its natural range in the UK (JNCC 2003). The UK Government aims to substantially complete the network of marine SACs in 2012 through submission of 12 sites, including six Scottish sites (three in offshore waters, one inshore site, and two that span inshore and offshore waters).

b) UK identification of Annex I reef sites

Between 2008 and 2012 fifteen sites in UK offshore waters were proposed to the European Commission and the submissions are now recognised as Sites of Community Importance (SCIs) or candidate SACs: seven of the sites are in waters off Scotland. A further five possible SACs (Anton Dohrn Seamount, East Rockall Bank, Hatton Bank, Pobie Bank Reef and Solan Bank Reef) have been recommended to Scottish Government⁸.

Other offshore SACs with reef (H1170) as a qualifying feature are: Haig Fras, Stanton Banks and Darwin Mounds, which have been approved by the European Commission as Sites of Community Importance (SCIs). North-West Rockall Bank and Wyville Thomson Ridge candidate SAC (cSAC) proposals were submitted to the EC in August 2010; Pisces Reef Complex and Wight Barfleur Reef cSACs were submitted to the EC in September 2012; and, Anton Dohrn Seamount, Hatton Bank, East Rockall Bank and Solan Bank Reef which have recently been approved as possible SACs (pSACs).

Pobie Bank Reef SAC is located in the Northern North Sea Regional Sea. There are four other SACs within this regional sea for which reef is a qualifying feature: Berwickshire and North Northumberland Coast

Joint Nature Conservation Committee

⁶ JNCC 08 P14a December 2008 Progress towards completing the UK network of marine special areas of conservation (SACs) for Annex I habitats and site proposals for Hatton Bank and Bassurelle Bank

⁷ Regional Seas: <u>http://jncc.defra.gov.uk/page-161</u>.

⁸ These sites are now possible SACs and were subject to public consultation between March and May 2012.

SAC, Isle of May SAC, Dornoch Firth and Morrich More SAC, and Mousa SAC. Pobie Bank Reef is the only one of these located in offshore waters; the others cover intertidal and shallow circalittoral reef. Pobie Bank supports a benthic community associated with deep circalittoral bedrock and stony reef which is very different from other SACs in the regional sea.

c) Conservation objectives and management of sites

JNCC and SNH are responsible for establishing conservation objectives for the features in the site, and for advising Competent Authorities of operations that could cause deterioration of the habitat and/or decline in the populations of its typical species. These conservation objectives and advice on operations are presented in a Draft Conservation Objectives & Advice on Operations document and inform the responsibilities of the Competent Authorities in the management of activities within the site. Special provisions are made for the consideration of current and future plans and projects that impact on the site (but are not directly connected with management of the site for conservation purposes). The goal of these provisions is to ensure that carrying out plans and projects does not adversely affect the integrity of the site. Management activities are intended to ensure marine habitats and species are maintained at, or restored to, favourable condition. Management relating to conservation of the site features (e.g. fisheries management) must be established within six years of the site being designated as an SCI (so that the site can proceed to full SAC designation). Under UK regulations, plans and projects that may have an impact on the site must be considered as soon as the site is submitted to the EC as a cSAC.

To fulfil conservation objectives for Annex I reef in offshore waters, a Competent Authority must, where possible, manage human activities to ensure that the feature is not negatively affected through: 1) physical damage by physical disturbance or abrasion; and/or 2) biological disturbance by selective extraction of species.

1.3 Background information on the Impact Assessment

This report sets out the evidence base that supports the IA summary page for the policy options for the Pobie Bank Reef pSAC IA. Two options were considered for this site:

Baseline:do nothingOption 1:designate the site

No other options are considered as Pobie Bank Reef, along with existing SACs and the other reef sites currently proposed, has been identified as an example of reef habitat to contribute towards the Natura network of sites for conservation. Other areas of similar habitat sub-type, where they exist, have been considered for selection as SACs but have been rejected for scientific reasons during earlier scoping.

Under the baseline option activities (e.g. fishing) are assumed to continue at current levels, potentially causing damage to the reef habitat and species.

This IA presents the potential costs and benefits of designating the site. The approach is based on that adopted by JNCC for previous offshore SAC IAs (Eftec 2008); it includes a quantitative assessment of economic impacts and a qualitative assessment of ecosystem benefits. A framework is used to combine and assess cost and benefit information on the likely impacts of designation.

This framework includes a description of:

- What the current situation at the site is (the baseline), such as the site's ecological characteristics, the economic activities taking place, their value, and their environmental impacts;
- What changes, relative to baseline, are expected to result from potential management measures that may be required to meet the site's conservation objectives;
- What the direct and indirect economic costs of those changes are to operators, enforcement authorities and wider society;
- The likely benefits of achieving the conservation objectives; and
- The different data that can be used to estimate costs and benefits, including: impacts on goods and services that are bought and sold in commercial markets that can be valued in monetary units; impacts

on goods and services that are not traded in commercial markets (that are less easy to value); and other impacts (such as change to non-use value).

Impacts have been assessed over ten years. This timescale is sufficient for the conservation of some species and habitats and the implementation of fisheries management measures. Assessment of the impacts beyond ten years becomes more uncertain. For example, there is greater scope to adjust fishing activities and may therefore avoid costs that arise in the short-term. Costs are calculated using a discount rate of 3.5% per annum, based on Green Book recommendations⁹.

2 BACKGROUND INFORMATION ON THE SITE

2.1 Baseline

The current condition of the site forms a baseline scenario against which the potential impacts of the policy options are assessed. This section assesses the current activities at the site and what is likely to happen over the assessment period if the site is not designated. This is the baseline against which the potential costs and benefits of designation are compared in Section 4. The monetary costs and benefits of the baseline are zero since no additional actions will be taken (however considerable cost could be incurred if the European Commission pursued an infraction case against the UK for failing to fully implement the Habitats Directive).

2.2 Characteristics of the site

Pobie Bank Reef is located in the northern North Sea, approximately 20km east of Unst, Fetlar and Whalsey in Shetland, separated from Shetland by the Unst Basin. The proposed SAC is approximately 70km long (crest running NNE to SSW) and up to 21km wide. The depth within the proposed SAC ranges from 70m to over 100m; the average seabed depth within the site boundary is approximately 90m.

The reef is located on a bank of metamorphic and sedimentary rocks covered by a patchy veneer of sediment, ranging from sandy gravels to slightly gravelly sands. The bank overlays a flat plain of sedimentary rock, known as the East of Shetland Platform. The reef is composed of a combination of stony and bedrock reef which meet the definition of the Annex I habitat type 1170: Reef, under the EC Habitats Directive.

In the central section of the reef rugged, bedrock crops out from areas of sand and this represents the most topographically complex area. In most areas these outcrops are surrounded by large boulders and cobbles in a sandy matrix. Towards the north and south of the reef, bedrock outcrops are smoother and integrated with extensive areas of stony reef.

The reef provides a habitat to an extensive community of sponges and bryozoans. In the shallowest areas the bedrock and boulders also support encrusting coralline algae. Axinellid cup sponges (*Axinella infundibuliformis*) are common on the bedrock and stony reef at depth ranges of 70m to over 100m. The bryozoan *Omalosecosa ramulosa* is also common on these reefs, but this species is rare in inshore sites in this regional sea. In the deepest areas (>100m), low-lying silty bedrock is commonplace, supporting small erect sponges, cup corals (*Caryophyllia smithil*) and the brittlestar *Ophiura albida*.

⁹ HM Treasury, The Green Book: http://www.hm-treasury.gov.uk/data_greenbook_index.htm

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Figure 2.1 Map of Pobie Bank Reef pSAC, showing proposed site boundary and the distribution of Annex I reef habitat

2.3 Vulnerability of the site to human impacts

Table 2.1 below provides an initial assessment of the site's vulnerability; it is taken from the draft Conservation Objectives and Advice on Operations document for this site. Vulnerability depends on the sensitivity of the reef species to the specified pressures from human activities, and current exposure to those pressures. Only if a site feature is both sensitive and exposed to a human activity is it considered vulnerable.

Scores of relative sensitivity (likelihood of damage or death following exposure to a pressure), exposure to pressure and vulnerability have been derived using best available scientific information and informed scientific interpretation and judgement; the assessment is dynamic and will be revised as necessary to reflect new research or evidence. (See Pobie Bank Reef draft Conservation Objectives and Advice on Operations¹⁰ for more-detailed information.)

¹⁰ Available from: <u>http://jncc.defra.gov.uk/pdf/Pobie%20Bank%20Reef_DraftConservationObjectivesandAdviceonOperations_v2.0_withbookmarks.pd</u>

Table 2.1Sensitivity, exposure and vulnerability of the Pobie Bank Reef to physical, chemical and
biological pressures (from Pobie Bank Reef Conservation Objectives and Advice on Operations v2.0)**Sensitivity key:**••• = High sensitivity •• = Moderate sensitivity • = Low sensitivity, \circ = No known sensitivity*
and ? = Insufficient information to make assessment (*Meaning: 'Sensitivity of the feature has been
researched and no evidence of sensitivity to this pressure has been found')

Exposure key: High = High exposure, Medium = Medium exposure, Low = Low exposure, None = No known exposure, Unknown level = Exposure of an unknown level and **?** = Insufficient information to make assessment.

List of pressur or disturbance	es which may cause deterioration (with example activities)	Pobie Bank Reef: rocky and stony reef			
		Sensitivity	Exposure	Vulnerability	
Physical Loss	Removal (e.g. aggregate dredging, isolated rock dump, infrastructure development)	•••	None	No known vulnerability	
	Obstruction (e.g. permanent constructions [oil & gas infrastructure, windfarms, cables] & wrecks)	•••	Low	Moderate	
	Smothering (e.g. drill cuttings)	••	None	No known vulnerability	
Physical Damage	Changes in suspended sediment (e.g. screening plumes from aggregate	••	Low	Low	
	Physical disturbance or abrasion (e.g. mobile benthic fishing, anchoring, windfarm scour pits, pipeline burial, potting)	•••	Low	Moderate	
Non-physical disturbance	Noise (e.g. boat activity, seismic)	0	?	No known vulnerability	
	Visual presence (e.g. recreational activity)	0	None	No known vulnerability	
Toxic contamination	Introduction of synthetic compounds (e.g. TBT, PCBs, industrial chemical discharge, produced water, fuel oils)	••	None	No known vulnerability	
	Introduction of non-synthetic compounds (e.g. heavy metals, crude oil spills)	••	None	No known vulnerability	
	Introduction of radionuclides (e.g. nuclear energy industry)	?	None	No known vulnerability	
Non-toxic contamination	Changes in nutrient loading (e.g. outfalls)	?	None	No known vulnerability	
	Changes in thermal regime (e.g. cooling water discharges)	?	None	No known vulnerability	
	Changes in turbidity (e.g. laying of pipelines, aggregate dredging)	•	None	No known vulnerability	
	Changes in salinity (e.g. outfalls from rigs, ships)	•••	None	No known vulnerability	
Biological disturbance	Introduction of microbial pathogens (e.g. outfalls)	?	?	No known vulnerability	
	Introduction of non-native species and translocation (e.g. ballast water, hull fouling)	?	?	No known vulnerability	

List of pressure or disturbance	es which may cause deterioration (with example activities)	Pobie Bank Reef: rocky and stony reef				
	Selective extraction of species (e.g. bioprospecting, scientific research, demersal fishing)	Sensitivity	Exposure Low	Vulnerability Moderate		

Table 2.1 shows that Pobie Bank Reef and associated biological communities are:

- Moderately vulnerable to obstruction (e.g. wrecks and pipeline), physical disturbance or abrasion (e.g. from demersal fishing) and selective extraction of species (e.g. from demersal fishing);
- Vulnerable at low levels to changes in suspended sediment (e.g. from demersal fishing)

It has not been possible to determine whether the interest feature is vulnerable to noise, introduction of radionuclides, introduction of microbial pathogens and introduction of non-native species.

The reef is at risk of deterioration under the baseline as a result of the potential impacts of demersal fishing. Deterioration of the habitats would not achieve the aims of the Habitats Directive to maintain or restore Annex I habitats.

The conservation objective, based on current evidence, for the management of Pobie Bank Reef is to maintain or restore the reefs to favourable condition. Activities that do not result in pressures to which the feature is sensitive may continue at current levels of spatial and temporal intensity. The management of other activities to which the feature is vulnerable may need to be reviewed by the Competent Authorities responsible.

2.4 Human activity and regulation of activity at the site

Current and proposed economic activity at Pobie Bank Reef is described below under the following sectors:

- Oil and gas two oil pipelines run adjacent to the north west corner of the site; one oil pipeline crosses the south west margin of the site;
- Renewables part of the SAC overlaps an area of search for future development of offshore wind energy;
- Aggregate extraction no licensed aggregate activities within or near the site;
- Shipping low to moderate shipping activity originating from the Shetland Islands;
- Cables one inactive telecommunications cable crosses the site, no active cables run near or through the site;
- Fisheries activity in part of the site and the surrounding area.

There are no other significant current or planned economic activities at the site.

Under both inshore and offshore Habitats Regulations Competent Authorities must carry out an Appropriate Assessment before undertaking or authorising a plan or project that could significantly affect a designated site. Initially the Competent Authority can agree to the plan or project only if it is certain that it will not adversely affect the integrity of the site. However, a Competent Authority can agree to a plan or project that will have an adverse effect if there are reasons of overriding public interest and permission from Scottish Ministers and the Secretary of State.

Not all activities that may affect the reef are considered plans or projects under the Habitats Regulations. Ongoing activities at the site which may be affecting the habitat of interest and preventing it from reaching or being maintained at favourable conservation status may need to be managed through the development of specific management measures (e.g. certain fishing methods, which may be controlled through measures taken under the European Common Fisheries Policy).

a) Oil and gas

Description of known current and future activity relevant to the site

Two oil pipelines pass less than 3 km outside of the North West Corner of the site boundary and an oil pipeline (the Laggan-Tormore export pipeline) crosses a short section of the south west corner of the site. The pipelines do not cross or impact Annex I reef habitat and should not therefore be affected by designation of the site.

Regulation and consents (baseline)

The environmental impacts of oil and gas activities are regulated by the Department of Energy and Climate Change (DECC). An Environmental Impact Assessment (EIA) is required under the Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) (Amendment) Regulations 2007 and an Environmental Statement will be submitted by the operator to DECC prior to consent for the activity under the Petroleum Act 1998. A full Environmental Statement may not be required for certain proposals where it is thought that an activity will not have a significant effect on the environment, based on information provided in a Petroleum Operations Notice (PON) 15 submission.

Requirements of the Birds and Habitats Directives in relation to oil and gas plans or projects within UK waters and the UK continental shelf are implemented through The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 (as amended). Regulation 5 of the Regulations requires DECC to consider whether an Appropriate Assessment (AA) should be undertaken prior to granting any consent under the Petroleum Act 1998. The regulations also require consent to be obtained for geological surveys and for the testing of equipment to be used in geological surveys related to oil and gas activities undertaken in UK waters and the UK continental shelf.

The decommissioning of disused offshore installations and pipelines is governed by national and international regulations and overseen by DECC's Offshore Decommissioning Unit. Decommissioning includes the preparation and submission of a Decommission Programme supported by an EIA. Relevant legislation include: Petroleum Act 1998, Energy Act 2008, Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 (as amended), and OSPAR Decision 98/3.

Likely future regulation of activity following designation

Any oil and gas plan or project would be subject to screening to assess if it were likely to have a significant effect on the reef at Pobie Bank Reef SAC. If effects are likely to be significant, an AA would be conducted by DECC, with information provided by the developer, including environmental information such as that normally provided for EIA outside a Natura site. It is normally possible to ensure that a plan or project will not have an adverse effect on site integrity. If mitigation measures are not possible, the proposed development must be refused, unless the competent authority considers that there are imperative reasons of overriding public interest (IROPI) for the development to proceed, and no alternative solutions.

b) Renewables

Description of known current and future activity relevant to the site

Part of Pobie Bank Reef pSAC overlaps an area of search (N7) for future development of offshore wind energy which was identified in Scottish Government's Draft Plan for Offshore Wind Energy in Scottish Territorial Waters (Marine Scotland, 2010). Pobie Bank Reef SAC could constrain development in a small area of NW7; however it is not possible to determine the likelihood of development in this area and therefore potential costs are not considered further in this IA.

Regulation of activity (baseline)

Wind energy schemes in the Scottish region are regulated by Marine Scotland and an Environmental Impact Assessment (EIA) is required for all proposals. From these Marine Scotland will determine whether an Appropriate Assessment (AA) should be undertaken to fulfil the requirements of The Conservation (Natural Habitats &c.) Regulations 1994 or the Offshore Marine Conservation Regulations 2007 (as amended).

Likely future regulation of activity following designation

Any wind energy plan would be subject to screening to assess if it was likely to have a significant effect on the qualifying interest features of Pobie Bank Reef pSAC. If effects are likely to be significant an AA would be conducted by Marine Scotland with information provided by the developer, including environmental information such as that normally provided for EIA outside of a Natura site. It is normally possible to ensure that a plan or project will not have an adverse effect on site integrity. If mitigation measures are not possible, the proposed development must be refused, unless the competent authority considers that there are imperative reasons of overriding public interest (IROPI) for the development to proceed, and no alternative solutions.

c) Shipping

Description of known current and future activity relevant to the site

From Automatic Identification Systems (AIS) on vessels, it is possible to calculate the number passing over a 5 km x 5 km cell within a given year. For the cells corresponding with Pobie Bank Reef area, the number of vessel passes ranged from 0 to 570 for 2008. This is compared to shipping lanes located 10 miles away where levels can reach 7000 vessel passes per year. The area of highest shipping intensity over the pSAC is located directly to the west, around Shetland.

There are no anchorages within or near the boundary.

Regulation of activity (baseline)

The International Convention for the Prevention of Pollution from Ships (MARPOL) aims to protect the marine environment from pollution from operational and accidental sources. The MARPOL Convention was adopted by the International Maritime Organisation in 1973; subsequently six technical Annexes were added and came into force in 1983:

- Annex I Regulations for the Prevention of Pollution by Oil
- Annex II Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk
- Annex III Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form
- Annex IV Prevention of Pollution by Sewage from Ships
- Annex V Prevention of Pollution by Garbage from Ships
- Annex VI Prevention of Air Pollution from Ships (entry into force 19 May 2005)

Signatories to the Convention, which include the UK, must accept Annexes I and II, but the other Annexes are voluntary.

Likely future regulation of activity following designation

The site is proposed for its reef habitat, which is unlikely to be affected by shipping passing above it, therefore under the 'designate' option, no change to current practices is likely to be required to fulfil the conservation objectives for the reef.

d) Cables

Description of known current and future activity relevant to the site

An inactive cable runs through the north of this site. No active telecommunications infrastructure currently passes through or is known to be planned for the site.

Current Management of Activity (Baseline)

There is currently no regulation for the laying of cable in offshore waters, however cables are usually laid on soft sediment and are not likely to be laid on reef (or other uneven surface) where they could easily tangle. It is therefore assumed that no cables would be laid in the future within the pSAC area.

e) Fisheries

Description of known current and future activity relevant to the site

Fishing is managed at a UK and European level, but non-European Union vessels may fish by agreement. Comprehensive data on location and type of fishing are difficult to obtain and recent fishing data are a reflection of activity already managed by total allowable catch and species quotas. Recent data are, however, used here as a best estimate of baseline fishing activities prior to any designation.

The distribution of fishing effort within the region can be obtained for UK vessels (\geq 15 m) that have vessel monitoring systems (VMS). These provide vessel's position, speed and heading either hourly or every two hours. As vessels fish at characteristic speeds, VMS data can be processed to provide proxy patterns of 'active fishing' based on vessels speed and these patterns can be analysed spatially in relation to the site boundary. Using a speed rule to partition active fishing from VMS is a coarse but effective means of estimating fishing effort (Mills *et al.* 2007) for towed gear; it is less reliable for set gear such as pots and nets. It is not possible to obtain comprehensive data on the location of vessels with lengths of 15 m or less. VMS data has been used to estimate fishing effort within SACs as set out in section 4.2b.

There are no landings data available specifically for the area which is proposed for designation. Marine Scotland and the Marine Management Organisation compile various data at the level of ICES rectangles Catch data encompasses information for UK-registered vessels landing in UK and non-UK ports, and for non-UK registered vessels landing in UK ports. Data includes:

- year
- size of vessel
- type of gear
- species caught

- port of landing
- vessel nationality
- value of landing
 - tonnage of landing

Note, the exception is for non-UK vessels that fish within territorial waters, but that land at non-UK ports; currently it is not possible to obtain weights and values of landings for these vessels. This IA is currently concerned with the impacts of the UK's potential designation of Pobie Bank Reef on UK businesses. However the effects of designations on other Member States are relevant.

Information on landings from the region around Pobie Bank Reef is given at the scale of ICES statistical rectangle (0.5° latitude, 1.0° longitude). The data are presented here in tables 2.2 to 2.6; five years are shown (2006-10) to illustrate interannual variation in catches. The area of Pobie Bank Reef SAC is 966 km² (less than 50% of an ICES statistical rectangle). Resolving whether fishing activities actually overlap with the site and feature is not therefore possible from landings data alone. Analysed VMS data¹¹ gives us an indication of how fishing effort is spread across the site and surrounding area with a resolution of 0.05 decimal degrees, but this is still coarse information.

¹¹ Generated by Cefas from VMS, log-book and EU vessel register data for 2006-9. All vessels (UK & non-UK) are included and fishing is estimated using a simple speed rule of 1-6 knots to represent fishing activity

Cetas (2010) Report no. 1: Objective 1 – Provision of geo-database containing standardised layers showing the distribution of specified activities, sites and resources with associated metadata and comments. Project MB106: Further development of marine pressure data layers and ensuring the socio-economic data and data layers are developed for use in the planning of marine protected area networks





ICES	2006		2007		2008		2009		2010		Average		Relative (%)	
	Weight	Value	Weight	Value	Weight	Value								
	(t)	(k£)	(t)	(k£)										
50E9	14,124	7,023	20,672	13,647	3,403	5,702	8,118	8,977	5,307	7,336	10,325	8,537	47	44
50F0	10,384	8,137	9,909	7,406	5,348	6,402	5,966	6,759	5,105	5,689	7,342	6,879	34	35
49E9	5,797	4,689	3,678	2,879	3,242	3,491	3,626	3,855	4,418	4,991	4,152	3,981	19	21
TOTAL	30,305	19,850	34,258	23,932	11,993	15,595	17,710	19,591	14,830	18,016	21,819	19,397	100	100

Table 2.2Fisheries landings 2006-10 from the ICES rectangles containing Poble Bank Reef pSAC.

Table 2.3Fisheries landings 2006-10 from the ICES rectangles 50E9 and 49E9 divided by vessel nationality.

Vessel Nationality	2006		2007 2		200)8 2009		2010		Average		Relative (%)		
	Weight (t)	Value (k£)	Weight	Value										
Scotland	13,947	8,906	15,383	11,395	4,980	8,385	10,094	11,491	7,673	10,570	10,415	10,149	72	81
England	4,547	2,474	6,404	4,254	852	502	658	611	557	441	2,604	1,656	18	13
Denmark	0	0	0	0	338	72	56	60	1,495	1,315	378	289	3	2
Northern Ireland	1,091	299	1,552	487	36	43	400	349	0	0	616	235	4	2
Ireland	0	0	448	244	151	110	85	77	0	0	137	86	1	1
Norway	0	0	564	146	287	81	116	95	0	0	193	64	1	1
Sweden	0	0	0	0	0	0	334	149	0	0	67	30	<1	<1
Faeroe Islands	336	33	0	0	0	0	0	0	0	0	67	7	<1	<1
Germany	<1	1	0	0	0	0	0	0	0	0	0	0	<1	<1

Port of Landing	2006		2007 2008		200	2009 20		2010 Ave		rage Relative		ve (%)		
	Weight (t)	Value (k£)	Weight	Value										
Otter trawls - midwater	14,087	4,381	16,914	8,500	1,819	992	7,378	5,442	5,310	4,478	9,101	4,758	63	38
Otter trawls - bottom	2,724	3,818	2,025	3,628	2,820	4,803	2,578	4,194	2,680	4,603	2,566	4,209	18	34
Scottish seines	699	1,055	850	1,387	970	1,618	751	1,210	596	1,101	773	1,274	5	10
Boat dredges	267	1,132	247	556	299	512	296	801	297	1,101	281	821	2	7
Otter twin trawls	112	202	143	307	286	668	301	678	211	515	211	474	1	4
Pair trawls - midwater	0	0	2,914	1,468	151	110	135	108	143	39	669	345	5	3
Pair trawls - bottom	1,273	690	161	244	146	211	132	199	99	136	362	296	3	2
Purse seines	616	185	1,001	279	0	0	116	95	352	280	417	168	3	1
Pots	74	90	70	114	103	174	42	77	15	35	61	98	<1	1
Set gillnets (anchored)	14	71	2	8	32	73	2	5	0	0	10	31	<1	<1
Longlines (not specified)	32	47	17	28	5	9	4	5	<1	1	12	18	<1	<1
Otter trawls (not specified)	9	17	0	0	5	7	0	0	14	17	6	8	<1	<1
Other	14	25	6	4	7	16	9	16	8	19	9	16	<1	<1

Table 2.4	Fisheries landings 2006-10 from the ICES rectangles 50E9 and 49E9 divided by gear type.
Table 2.4	Fishenes landings 2006-10 from the ICES rectangles 50E9 and 49E9 divided by gear type.

Port of Landing	200)6	2007		200)8	200)9	201	10	Ave	rage	Relati	ve (%)
	Weight (t)	Value (k£)	Weight	Value										
Lerwick	10,037	5,589	11,014	6,618	3,000	4,979	5,520	6,241	4,443	6,314	6,803	5,948	47	48
Peterhead	1,632	931	4,473	2,887	1,473	1,310	3,758	3,020	3,109	2,760	2,889	2,182	20	17
ljmuiden	3,331	1,868	4,845	3,632	824	472	649	588	375	341	2,005	1,380	14	11
Yell and Fetlar	262	638	640	1,152	631	1,128	136	219	0	0	334	627	2	5
Cullivoe	0	0	0	0	62	121	538	980	488	963	218	413	2	3
Fraserburgh	89	226	102	227	99	237	616	606	716	639	324	387	2	3
Scheveningen	1,184	560	1,537	588	0	0	0	0	143	39	573	237	4	2
Whalsay	1,004	434	110	231	157	271	27	55	22	62	264	211	2	2
Scrabster	77	167	119	227	107	169	74	124	82	160	92	169	1	1
Scalloway and Isles	83	112	40	63	133	218	128	218	76	144	92	151	1	1
Central Shetland	71	353	67	132	91	158	0	0	0	1	46	129	<1	1
Vidlin	0	0	0	0	10	17	94	206	95	390	40	122	<1	1
Mid Yell	0	0	0	0	17	41	44	132	64	314	25	97	<1	1
Hirtshals	0	0	873	477	0	0	0	0	0	0	175	95	1	1
Out Skerries	0	0	0	0	14	27	73	219	76	131	33	75	<1	1
Unspecified Norwegian Port	621	191	437	133	0	0	0	0	0	0	212	65	1	1
Aberdeen	122	171	48	67	6	10	0	0	0	0	35	50	<1	<1
Sullom / Toft	0	0	0	0	0	4	44	149	6	26	10	36	<1	<1
Unspec.German port	795	168	0	0	0	0	0	0	0	0	159	34	1	<1
Northmavine	21	41	22	42	0	0	0	0	0	0	8	17	<1	<1
Floro	286	77	0	0	0	0	0	0	0	0	57	15	<1	<1
Maloy	255	69	0	0	0	0	0	0	0	0	51	14	<1	<1
Buckie	27	42	6	16	1	3	1	1	0	0	7	12	<1	<1
Other	27	75	19	33	18	31	43	73	28	44	27	51	<1	<1

Table 2.5Fisheries landings 2006-10 from the ICES rectangles 50E9 and 49E9 divided by port of landing.

Joint Nature Conservation Committee

Species	2006 2007)7	2008		200)9	201	10	Average		Relative (%)		
	Weight (t)	Value (k£)	Weight	Value										
Mackerel	655	550	10,014	7,343	783	678	7,233	5,801	5,598	4,993	4,856	3,873	34	31
Herring	15,472	4,675	10,813	2,934	1,525	495	1,084	364	817	329	5,942	1,759	41	14
Angler fish	309	1,023	369	1,147	441	1,521	363	1,474	282	1,166	353	1,266	2	10
Haddock	1,131	1,543	903	1,402	1,065	1,529	671	943	585	899	871	1,263	6	10
Cod	330	793	355	852	476	1,194	468	953	507	1,172	427	993	3	8
Scallops	266	1,131	247	556	299	512	296	799	297	1,101	281	820	2	7
Whiting	539	570	658	812	753	948	664	844	568	772	636	789	4	6
Megrim	131	353	155	432	161	518	146	445	181	562	155	462	1	4
Saithe	190	104	253	130	420	266	283	216	337	350	297	213	2	2
Nephrops	36	192	23	129	66	363	49	210	39	139	42	207	0	2
Ling	91	124	85	108	137	199	133	167	137	192	117	158	1	1
Squid	42	121	33	99	55	177	34	93	57	170	44	132	<1	1
Pollack	25	42	31	55	74	180	54	124	49	120	47	104	<1	1
Lemon Sole	29	79	26	77	29	87	22	49	18	52	25	69	<1	1
Hake	31	47	51	70	69	91	49	56	52	73	51	67	<1	1
Plaice	72	68	65	70	71	62	54	45	66	54	66	60	<1	<1
Halibut	6	34	7	49	8	51	8	54	4	41	7	46	<1	<1
Skate & Ray	42	40	42	45	48	51	33	39	12	14	35	38	<1	<1
Edible crab	54	52	53	50	57	55	20	21	9	10	38	38	<1	<1
Velvet crab	16	27	15	33	29	66	14	27	4	11	16	33	<1	<1
Lobsters	1	8	2	31	3	43	2	27	1	13	2	25	<1	<1
Witch	19	23	17	23	22	30	17	23	13	18	17	23	<1	<1
Turbot	2	15	1	12	2	16	2	16	2	16	2	15	<1	<1
Other	434	100	131	67	51	60	45	44	91	60	150	66	1	1

Table 2.6Fisheries landings 2006-10 from the ICES rectangles 50E9 and 49E9 divided by target species.

Joint Nature Conservation Committee

Of the ICES rectangles that Pobie Bank Reef covers (Figure 2.3), 50E9 – the square that contains the northern half of the site – produces the most significant landings (£8.5m.pa from 2006-10, Table 2.2). Next in terms of catch value is 50F0, but as the site covers less than 1% of the ICES rectangle it has been excluded from further analysis. Most of the catch is landed in Scottish ports, predominantly Lerwick and Peterhead. Significant foreign ports include ljmuiden and Scheveningen in the Netherlands where large quantities of mackerel and herring are landed.

Most fishing in these ICES rectangles is midwater trawling for mackerel and herring (£3.9m.pa and £1.8m.pa 2006-10 respectively, Table 2.6), smaller amounts of haddock and whiting are caught with Scottish seine nets. There are also significant landings of angler fish (£1.3 m.pa 2006-10), haddock (£1.3 m.pa 2006-10) and cod (£1.0 m.pa 2006-10) using bottom otter trawls. Annex I shows that fishers with towed demersal gear (over 15m) tend to avoid the centre of the pSAC.

Large quantities of herring were landed by midwater trawlers in 2006 and 2007 which has boosted landings in these years. Variation in landings between years is high and reflects changing markets, regulations (e.g. proper implementation of the Buyers and Sellers Register), quota allocation, and fishing effort, in addition to changes in the abundance of fish and shellfish.

Dredging for scallops by vessels both over and under 15m long is carried out in the area. We only have location information for vessels over 15m, which indicates that most activity is outside of the site. In the absence of further information it has necessarily been assumed that the under 15m fleet is similarly distributed. Of the total catch landed from 49E9 and 50E9, £630 k.pa and £333 k.pa (2006-10) respectively were landed by vessels of 15m or under, equating to 6% and 7% of all landings from those rectangles during that period. The majority of these landings, in terms of value, are made with mechanised dredges targeting scallops.

Current management of fishing (baseline)

There are no fisheries closures over, or close to, Pobie Bank Reef. However the European Union's Common Fisheries Policy (CFP) sets an overall framework for regulation of fisheries in UK waters. European competence and specific regulations vary in their application depending on geography. In the UK, the management of fisheries in all waters beyond 12nm fall under the jurisdiction of the European Union through the CFP. The policy is transposed through the Control Regulations which allow annual fish quotas to be set, and Technical Conservation Regulations that deal with measures such as gear restrictions and area closures. Member States receive an annual allocation (quota) of each stock at December meeting of the European Union Fisheries Council (with a small amount of the total quota allocated to 0–12 nm)¹². Non-pressured stocks such as scallops and cuttlefish still have no applicable quotas. When quota levels are reached vessels tend to move into the inshore to catch those species for which there is a market but fewer restrictions on what can be landed.

In addition to setting catch limits, the CFP sets out regulations including minimum landing sizes for certain fish and area-based measures. Spatial measures include prohibiting particular fishing techniques in certain areas permanently, seasonally, or temporarily. The CFP can also limit fishing effort by limiting amounts of static gear or the power of the vessels that can take part in a fishery.

Fisheries regulations and policy are enforced in Scottish waters by Marine Scotland and Marine Scotland Compliance. Enforcement includes inspection of: fishing vessels in port, fishing industry premises and fish markets. At sea, fishing vessels are inspected by Marine Protection Vessels and monitored by surveillance aircraft¹³. Vessels over 15m in length are required to have a Vessel Monitoring System and their activities are monitored via satellite by Marine Scotland's Marine Monitoring Centre¹⁴.

Likely future regulation of activity following designation

¹² Quotas are informed by annual scientific stock assessment advice formulated by ICES; adherence to their advice is not mandatory.

¹³ http://www.scotland.gov.uk/Topics/marine/Compliance/resources [Accessed 12.10.11].

¹⁴ http://www.scotland.gov.uk/Topics/marine/Compliance/satellite [Accessed 12.10.11].

If management measures for a Marine Protected Area in offshore waters are required, the UK must seek them through a proposal for fisheries management measures under the CFP. The CFP is currently undergoing reform and a revised regulation will come into effect in January 2013.

If evidence shows that ongoing fishing activities at the site are posing a risk to feature condition, the UK will consider applying to the EC for controls to close all or part of the Pobie Bank Reef site to at least some forms of fishing in order to minimise risk of damage to habitat and associated typical species, including target and non-target fish and shellfish species.

3 APPROACH TO ANALYSIS OF COSTS AND BENEFITS

3.1 Approach

This IA presents a quantitative assessment of the potential costs and benefits to the UK of the policy option to designate the site. Section 2 outlined the current situation at the site (the baseline) in terms of economic activities. It should be remembered that the baseline may not be static (it may be subject to ongoing change), and the assessments try to take account of this (for example, where a benefit is identified as preventing continuing decline).

The necessary data to fully understand the employment and profit impacts from landings to foreign ports and from foreign vessels landing into the UK are complex. The value of these landings to the UK economy is limited because: landings by foreign vessels to UK ports are frequently transported directly overseas from their port of landing without any onshore processing or marketing; and, a large proportion of UK registered vessels landing overseas are UK Registered Foreign Owned vessels (UKRFO) which convey limited economic benefit to the UK economy (for a detailed discussion of these factors see Defra 2009). It is not possible to distinguish landings from UK registered UK owned vessels from those by UKRFO vessels. Landings to foreign ports and by foreign registered vessels landing to the UK have therefore been excluded from headline cost figures for this IA but the potential for indirect benefits to the UK economy (e.g. purchasing of fuel) from these landings should be recognised.

This method of assessment has been used to develop IAs for the suite of marine Natura 2000 sites consulted on by JNCC in 2009-2011. However, different sites have different baselines, activities and circumstances. Therefore the same type of impact may have different costs or benefit at different sites.

Section 4 examines the potential costs and benefits of the policy option. The costs and benefits are subject to significant uncertainty. The main causes for this uncertainty are that:

- It is difficult to predict what management measures will be implemented at the site;
- It is difficult to know how operators will respond to them and what costs they will incur in doing so; insofar as they can predict this there may be reasons in some cases for not supplying this information, for example: commercial sensitivities;
- It is difficult to predict how the condition of the protected features and surrounding environment would change under Option 1 (designate); and
- There is currently very little evidence which can be used to monetise values for environmental changes in the marine environment.

Therefore the approach to the assessment has:

- Used techniques to obtain the best available information on these areas of uncertainty. This is done
 firstly by developing scenarios on likely potential maximum and minimum management measures;
 and secondly by drawing on sources most likely to be able to predict the impacts of these potential
 management measures and provide relevant information;
- Used a framework of factors likely to determine the benefits to society of achieving the conservation objective of the site;
- Identified the possible minimum and maximum impact on economic sectors rather than the actual expected impact; and

• Not assessed the precise direct or indirect impacts on businesses, employees or elements of the supply chain potentially affected because there is insufficient evidence available to accurately predict the distribution of net changes in activity within the regional economy.

The analysis presented in this document is based on the methods that are judged to be the best practicable option to address the issues considered.

3.2 Costs

a) Policy costs to the private sector

The policy costs arising from designation of the site are the costs of changes to existing and planned human activities taking place within or in the vicinity of the site to comply with the policy objectives. The costs considered include the direct and indirect economic costs of those changes to operators, enforcement authorities and wider society. The costs are expected to result from the potential range of management measures that may be required to meet the site's objectives. The costs are considered relative to the baseline of not designating the site.

The costs borne by each key sector will depend on the extent to which their activity impacts on the site and the management measures deemed necessary to restore the reef and its typical species to favourable condition. These measures are not yet known. It has therefore been necessary to estimate a likely range of measures for this site. It is assumed that the site will be transmitted to the European Commission by October 2012, and that some costs (for example, administration) could arise immediately. If fisheries management measures are required they are likely to take at least a year to be developed and implemented but could take considerably longer as a range of issues must be addressed with domestic and foreign stakeholders. For this assessment we have assumed that fisheries management measures are implemented in 2014.

Policy costs to the private sector may arise if:

- Consent for a plan/project is granted, it may be subject to restrictions on the timing or manner in which it can be implemented which result in costs to businesses. Restrictions are determined by the Competent Authority;
- Consent for proposed plans or projects may be refused by the competent authority. The cost to
 businesses is assumed for this analysis to be the additional cost of undertaking the plan or project
 elsewhere; and,
- Activity in the area is restricted (e.g. certain fishing activity) and costs to business occur in the form of foregone income/profit.

b) Administration costs to the private sector

Administration costs include time and expenditure necessary for the private sector to provide information and documentation to comply within the administration requirements of a regulation. They exclude policy costs, which are the time and expenditure necessary to adjust activities (e.g. to reduce pollution) to comply with regulatory standards. Potential administration costs to the private sector are:

- The costs to businesses of finding out about the designation and its management measures;
- For ongoing or new plans and projects, the cost to businesses of providing detailed information to inform the Competent Authority's¹⁵ assessment under the habitats regulations; and
- Undertaking more detailed analysis (such as Environmental Impact Assessment) and reporting if required.

c) Costs to the public sector

Potential administration costs to the public sector are:

¹⁵ Competent Authorities include statutory undertakers, as well as regulators which grant consents for regulated activities in the marine area. For example, DECC is a competent authority which regulates certain activities for wind farm, and oil and gas development.

- i. Costs of monitoring the site and maintaining information on its conservation status; and
- ii. Costs of regulating and enforcing human activities that might impact on the conservation status of the site.

3.3 Benefits

The benefits of site designation arise from the increase in the area protected for nature conservation¹⁶. Benefits are assessed as the impact on ecosystem services that benefits humans¹⁷. The following overarching categories of ecosystem services are used¹⁸:

- Provisioning services (e.g. provision of food);
- Regulating services (e.g. absorbing waste); and
- Cultural services (e.g. the role of marine species in culture and the artistic inspiration they provide).

Following Defra's guidance on the valuation of ecosystem services, benefits from supporting services¹⁹ (such as cycling of nutrients and photosynthesis) are assumed to be captured by the other benefits listed and so are not examined separately²⁰. The analysis in Section 4 is based on a list of ecosystem service categories that are relevant to the site.

The impacts of designation on these ecosystem services are analysed in Section 4.3 below. In addition to these categories biodiversity has an intrinsic value. This inherent characteristic of biodiversity gives rise to other benefits. Therefore, intrinsic value alone cannot be assessed using economic valuation techniques²¹ and is not analysed further here, but it should not be overlooked.

4 COSTS AND BENEFITS OF OPTION 1: DESIGNATE THE SITE

4.1 Implications of designation

To assess the range of potential costs and benefits likely minimum and maximum management measures for the site have been assessed. Choice of measures was informed by Table 2.1 and experience of managing similar sites.

The minimum scenario requires the smallest change in activities compared to the baseline while the maximum scenario requires the most change and highest costs. Together these scenarios enable us to estimate the range of possible costs for the site to achieve the conservation objective to restore or maintain the reef. Poble Bank Reef has a 'maintain or restore' conservation objective, a minimum management scenario could therefore be for activities to continue at current levels. Potential measures given here are only to capture the possible financial costs of designation: they will not steer future decisions on management of the site.

¹⁶ Heritage benefits, such as conservation of archaeological site, are the only benefits discussed that arguably sit outside the scope of nature conservation. Such benefits are still included.

¹⁷ As described in Parliamentary Office of Science and Technology (2007).

¹⁸ These are the categories used in the Millennium Ecosystem Assessment (MEA 2005), http://www.millenniumassessment.org [Accessed 01.11.11].

¹⁹ Supporting services described as "those that are necessary for the production of all other ecosystem services" in the MEA ²⁰ For example, small marine organisms called phytoplankton form the basis of the food chain, ultimately ending in caught fish species. Valuing phytoplankton on its own in addition to these services they support would lead to double counting. ²¹ For example, in MEA (page 7, Section 2): http://www.millenniumassessment.org/documents/document.354.aspx.pdf.

Table 4.1 Possible management measures for Pobie Bank Reef pSAC

Minimum scenario:	Maximum scenario:
Existing activities	Existing activities
No additional management of existing activities.	Ban all forms of demersal fishing over the site
	(including both static and towed gears).
<u>Proposed activities</u> No plans or projects in or near the site are currently known. It is assumed that, due to the location and nature of the site, that there will be no plans or projects undertaken near the site which are likely to have a significant effect on site integrity.	<u>Proposed activities</u> No plans or projects in or near the site are currently known. It is assumed that, due to the location and nature of the site, that there will be no plans or projects undertaken near the site which are likely to have a significant effect on site integrity.

4.2 Costs

In line with the purposes of this IA, this section deals only with costs to the UK economy. Fishing activities from other Member States were considered within the fisheries section, but are not included in the costs calculated below.

a) Shipping

There are not expected to be any changes to shipping over the site, so there are no increases to costs.

b) **Fisheries**

Potential UK economic impact of foregoing landings

The site may not be at risk from current levels of fishing if fishers using towed demersal gear avoid the reef to preserve their gear. A minimum scenario may therefore see no additional management of fishing activity at the site. The maximum scenario might be a fully precautionary approach where the site could be closed to all forms of bottom-contact gear (towed and static). (In reality management measures are likely to be somewhere between these two extremes.)

Shetland Fishermen's Association indicates that the pSAC encroaches on two important fishing grounds. It is likely that activity within any areas closed to fishing will be displaced to other fishing grounds, particularly those around Shetland, with impacts on profitability and fishers elsewhere. To provide an indication of the maximum direct effect of designation, the impact on the UK economy of foregoing the landings from bottom contacting gears from the entire pSAC is considered.

Using input-output multipliers allows analysis of the impact on the UK economy of loss of landings. However, it should be noted that multipliers are limited to a static reflection of economic linkages that change with time. The multipliers used were recommended by Sea Fish Industry Authority (SeaFish 2007) as the best available and account for landings in UK ports. Loss of £1m of landings could lead to a reduction in²².

- UK Employment by 65 Full Time Employment jobs; and
- UK GDP by £1.73 million.

Although it does not take account of the potential indirect effects of any reduction in landings (e.g. losses to fish processors and gear suppliers), these estimates give an indication of the scale of the economic impact from changes in fishing activity as a result of designation.

The economic impacts of the potential designation of Pobie Bank Reef pSAC are estimated as the loss of profitability of fishing effort at the site. This is based on the 2009 survey on the profitability of fishing,

²² Based on hybrid multipliers used in Table 3 ("The regionally disaggregated impact of £1m landings") of the report (SeaFish 2007). As data were not available at a regional level, the mean of the regional impacts was taken to represent the UK impact. http://www.seafish.org/upload/file/economics/FINAL-%20Input%20output%20report%20%20,full%20report.pdf [Accessed 1.11.11]. Joint Nature Conservation Committee 21 September 2012

(Seafish 2011), which shows that the net profit ratio does not exceed around 30% for any segments of the industry with most segments having much lower ratios.

The value of landings from the pSAC are calculated by multiplying landings values for each ICES rectangle by gear type by the proportion of fishing effort in that rectangle that occurs over the pSAC. Only landings to the UK by UK registered vessels are included. More detail on these calculations and the distribution of fishing effort is provided in Appendix I. Profit is calculated as 30% of gross landings from the pSAC.

Note that the costs calculated below assume that the distribution of fishing effort across ICES rectangles is the same for all sizes of fishing vessel within each gear category because we do not have data on the distribution of fishing effort for vessels of 15 m or under. This could be particularly significant for small dredgers and potting vessels as no over-15 m vessels fish with these gears within the pSAC boundary.

Table 4.2	Summary of management assumptions made in estimating costs to fisheries (Calculations
are shown in A	Appendix I).

Minimum scenario	Assumptions	Change in costs
No additional management of	No additional information demonstrating that	None
existing activities.	fishing at damages reef species.	
Maximum scenario	Assumptions	Change in costs
Ban all forms of demersal fishing	Profit estimated at 30% of average annual	Loss of total net profit
over the site, including both static	landings to UK ports by UK vessels from the	for all demersal gear:
(set gillnets and longlines) and	pSAC (£415k.pa gross).	
towed gears.		£124 k.pa
	Vessels of 15 m or under fish in the same	
	areas as larger vessels.	
	Unspecified longlining activity is static and	
	demersal.	

Under the maximum scenario vessels using demersal gear would be impacted. Gross profits from vessels fishing within the pSAC are set out in Appendix I by gear type. Maximum lost profit is estimated to be: £88 k.pa from bottom otter trawls; £9 k.pa from Scottish seines; £7 k.pa from otter twin trawls; £5 k.pa from bottom pari trawls; £5 k.pa from set gillnets and £11 k.pa from longlines). Landings data for the ICES rectangles containing the pSAC show that these are primarily Scottish vessels using towed gear and that they land to ports in Shetland (principally Lerwick, Scalloway and the Isles, and, Yell and Fetlar) and the north and east coasts of Scotland (principally Fraserburgh, and Scrabster).

As detailed above landings to foreign ports are not included in the cost analysis and headline figures presented in this IA however significant landings are detailed here for information because they may have indirect impacts on the UK economy. Catches from the pSAC by UK registered vessels using demersal gear were landed to France, Spain and Norway (estimated gross landings values were less than £1 k.pa, £1 k.pa and £7 k.pa respectively). These vessels are likely to be from UKRFO vessels, based on Defra (2009) and expert opinion. Landings to the UK from foreign vessels have not been resolved at a site level but average annual demersal landings from *the whole of all of the ICES rectangles* containing Pobie Bank Reef pSAC had a gross value of £15 k pa. These landings were from Norwegian vessels using static gill nets.

Further analysis

The analysis carried out to inform this IA was intended to provide an indication of economic impacts and their scale resulting from changes in fishing activity over the pSAC. Further information and analysis would be needed to understand more precisely how fishers would respond to measures and the impacts of their responses.

Whether fishermen are able to fish at alternative sites will depend on a number of considerations, a key factor being the availability of suitable grounds. There may also be weather and other seasonal constraints on moving to alternative areas.

Where fishermen do find alternative grounds there may be implications on costs and profitability such as increased fuel and labour costs and potentially a higher proportion of time spent steaming rather than fishing and therefore reduced profitability. Alternative grounds may also be less productive and mean that fishing days are less productive and therefore less profitable.

In some cases, particularly where moving to an alternative ground would become unprofitable, individual fishermen may stop fishing. This may not necessarily mean that total income to the sector will reduce, given fixed quotas for many stocks and if other vessels are able to draw on quota foregone, for example through co-operative arrangements. However, in many cases this will not happen. Quotas are often not fully used in any case and some stocks are not subject to quota. Where individual fishermen stop fishing then there may also be implications to the fishermen themselves wider than foregone revenue, such as: the need to dispose of a vessel, potential decline in the market value of vessels and potential decline in the value of quotas.

A further important issue is that any closures, even if undertaken unilaterally by the UK, would have to be agreed with other Member States of the European Union through the CFP. It is assumed that this process may take a minimum of a year to carry out and therefore that closures would not be in place until 2014. Although it may take longer than this period to actually put measures in place, using the minimum timeframe it ensures that costs are not underestimated.

It is recognised that fishers are currently be subject to a combination of impacts including marine SAC designations, proposed Marine Protected Area designations, and renewable energy related developments, however consideration of cumulative impacts is beyond the scope of this IA.

c) Administration costs to Government

The estimate of the costs to government arising as a result of the SAC designation have been largely based on the Financial Memorandum, published in relation to the Marine (Scotland) Act 2010. This presents a summary of the costs to the Scottish Government for implementing new marine site conservation measures²³.

One-off costs are related to: consultation, developing management schemes, and statutory instruments. Key stakeholders are likely to include the Scottish Government, fishers and their representatives, JNCC, SNH, and non-government conservation organisations. Further work could also be required to assess the impacts of present-day activities.

Monitoring would be undertaken by JNCC: an initial detailed survey would provide baseline information on the topography, geology and ecology of the reef; subsequent surveys would monitor the condition of the site and fulfilment of its Conservation Objectives, on a five year cycle. Survey techniques have not yet been decided but are likely to include acoustic mapping and ground truthing by video or grab sampling.

Marine and aerial surveillance in the vicinity of the wider area already takes place and ensure compliance with fisheries restrictions.

These costs to government are summarised as:

- *i.* Requirements to review and manage existing activities. It is assumed that work is necessary to develop, implement and communicate site-specific management measures. One-off costs of this work are estimated at £77k (£50k for consultation, £23k for work on management schemes and £4k for statutory instruments).
- *ii.* Enforcement. Additional enforcement costs (e.g. prosecutions) to Marine Scotland Compliance for any fisheries management measures are estimated to be £12k annually. This cost is assumed to start in 2014 when fisheries management measures are predicted to be in place.
- *iii. Ecological assessment and monitoring.* Assessment and monitoring costs are estimated at a one-off cost of £342k for baseline information gathering (assumed to occur in 2013) and further costs of £250k

²³ Summary of Costs to the Scottish Government for Implementing New Site Protection Measures in the Marine (Scotland) Bill: Final Regulatory Impact Assessment 2009. (Paragraph 96).

every five years for monitoring (assumed to first occur in 2018)²⁴. Note that these are tentative average estimates based the cost of previous surveys and assume work is carried out under partnership agreements rather than at commercial rates. The estimates are precautionary and may significantly decrease - JNCC aims to refine their survey and monitoring plans in 2012 and new timings and costs will be incorporated in this IA if they become available.

This IA assumes that administration costs are the same for minimum and maximum scenarios. Under both scenarios estimated impacts are one-off costs of £669k and annual costs of £12k.

4.3 Benefits of designating the site

Protecting Pobie Bank Reef from damage will enable species associated with it to grow, feed and reproduce. Some species live primarily on the reef (e.g. sponges and cup corals) while others (e.g. certain fish and shellfish) may use the reef temporarily for feeding, reproduction or protection. The benefits of protecting the reef habitat are both site-specific and Europe wide (as part of the network of Natura 2000 sites). Wider benefits occur because animals and plants disperse to other areas (e.g. invertebrates release larvae into the water which are swept to new sites by ocean currents). Together the Natura 2000 sites help towards maintaining and restoring the quality, productivity and diversity of marine ecosystems in European waters: these functions are vital for the sustainable delivery of ecosystem services. Benefits of designating the site are discussed below in terms of ecosystem services.

Fishing occurs over or adjacent to Pobie Bank Reef (Appendix 1) but we do not know if it impacts the reef community directly²⁵. If the reef was not designated it would remain at risk of damage from demersal fishing which can cause physical damage and removes fish and shellfish. Tall fauna which attach solidly to rocky surfaces are common; they include sponges and bryozoans. Such species are vulnerable to abrasion damage from demersal fishing and can be very slow to recover from such damage. More-detailed information on the sensitivity and exposure of the reef to fishing is given in Pobie Bank Reef draft Conservation Objectives and Advice on Operations. Deterioration of the stony or bedrock reef would undermine the aims of the EC Habitats Directive to maintain or restore Annex I habitats and their species to favourable conservation status. It would also prevent the site from delivering the beneficial ecosystem services described below.

a) Provisioning services

Fish, shellfish and other crustaceans for human consumption

Pobie Bank Reef provides a hard substrate in a predominately muddy, sedimentary environment increasing habitat heterogeneity and complexity. Habitat structures such as these have been shown to increase the number of juvenile fish species surviving to adulthood (e.g. Connell and Jones 2003 – New Zealand) by offering refuge from predation and competition.

b) Regulating services

Regulating services are not mentioned further here as their value is considered to be minimal at a site level.

c) Types of value

Option Values

Some people will gain from having the option to benefit in future from conservation of a good example of reef habitat, even if they do not currently plan to benefit from it (option value). This arises because if the site is not protected now there may not be good examples of reef habitat still available to conserve in future. Also, some will gain from knowing that it is conserved in case future information reveals that the reef habitat provides important benefits that we are not currently aware of (quasi-option value).

Non-use Values

Some people will gain from having the option to benefit in future from conservation of a good example of reef, even if they do not currently plan to benefit from it (option value). This arises because if the site is not

²⁴ N.Golding JNCC pers. comm. 7.11.2011

²⁵ Poble Bank Reef SAC: Draft Conservation Objectives and Advice on Operations v2.0 JNCC

protected now there may not be good examples of reef to conserve in future. Also, some will gain from knowing that it is conserved in case future information reveals that the reef provides important benefits that we are not currently aware of (quasi-option value).

There is reliable evidence in the UK and elsewhere that the general population has significant positive nonuse values associated with rare species (see for example Christie *et al.* 2004 for general discussion, or White, *et al.* 2001 for examples of value of conservation of specific mammal species). Additionally, Beaumont *et al.* (2006) estimate the non-use value of biodiversity of the UK marine environment at £0.5-1.1 billion per year across the UK population.

The effects of designation of Pobie Bank Reef for the provision of each of the ecosystem services described above is summarised in Table 4.3 as the difference due to site designation in comparison to the baseline (no designation). It is assumed that fisheries management measures and ecological monitoring will occur if the site is designated while if the site is not designated fishing will continue at current levels and the reef habitat will not be monitored.

There are four additional columns of information in the table to clarify our understanding of the qualitative changes in ecosystem services arising from (non-) designation:

•	Relevance Value weighting	Relating to the amount of ecosystem good or function arising from site
•	value weighting	from the site is in providing benefits to human population
•	Scale of benefits	Consideration of actual potential to deliver benefits (for example considering leakage, delivery to human population, etc.)
•	Confidence	Level of confidence in our current knowledge of all other categories (in other words, scale of benefit, level of improvement, etc.)

Based on the above categories, an overall level of each ecosystem service is defined with its own confidence level. Following, an overall level of total benefits is also defined.

The parameters are assigned a level for each service from a menu, defined as:

- *Nil* Not present/none.
- **Minimal** Present at a very low level, unlikely to be large enough to make a noticeable impact on ecosystem services.
- **Low** Present/detectable, may have a small noticeable impact on ecosystem services, but unlikely to cause a meaningful change to site's condition.
- Moderate Present/detectable, noticeable incremental change to site's condition.
 Present/detectable order of magnitude impact on sites condition.

Services	Relevance to site	Baseline Decline	Designate Min management	Designate Max management	Value weighting	Scale of benefits	Confidence
Fish for human consumption Fish for non-	Low. May provide shelter and habitat heterogeneity for commercially exploited fish and	Low. Interruption of lifecycle processes could mean significant decline.	Low. Fishing continues at current levels.	Low-moderate. Improvement on site may support species of human interest shellfish could 'spill-	Moderate. One of a few hard outcrops in a largely sedimentary	Low. Increase in stocks may be to be offset by declines caused by increased	Low.
human consumption	crustaceans.			over' to the surrounding area.	area.	fishing elsewhere.	
Carbon sequestration	Minimal. Features are likely to have low impact and the area covered is relatively small.	Minimal. Unlikely to affect biological pump.	Minimal. Unlikely to affect biological pump.	Minimal. Unlikely to affect biological pump	Moderate . High value but site plays minimal role	Minimal	Moderate. Biological pump not well understood.
Waste assimilation	Minimal. Features are likely to have low impact and the area covered is relatively small.	Minimal. Unlikely to affect assimilation functions.	Minimal. Unlikely to affect assimilation.	Minimal. Unlikely to affect assimilation.	Minimal. Site plays minimal role.	Nil.	Moderate. Assimilation not well understood.
Non-use value of natural environment	Low - Moderate . Public has preference for rare and visually appealing features.	Low. Impacts not known maybe slow decline.	Low-Moderate Impacts not known maybe slow decline.	Low-Moderate. Some recovery of biodiversity and community composition possible.	Moderate. All UK population is relevant but relatively low value per capita.	Low - Moderate	Low.
Scientific research	Low. Some basic scientific value, but level of uniqueness is unclear.	Low. Degradation could remove scientific value.	Low-Moderate. Degradation could remove scientific value.	Low-Moderate. Some recovery of biodiversity and community composition possible.	Moderate. For benthic ecology and fisheries.	Low - Moderate	Moderate.
Total value of changes in ecosystem services			Low - moderate for both	Low- Moderate			

 Table 4.3
 Potential significance of ecosystem services improvements for Pobie Bank Reef pSAC

d) Benefits to economic activity

Designation of sites may assist the different sectors that make use of the marine environment in the context of marine spatial planning and a more strategic consideration of available resources. This support would mean that sectors can undertake future plans and applications for their operations (for example applications for licenses) with the better knowledge of a) the nature conservation significance of different parts of the marine environment, and b) the added costs of these applications within or adjacent to a site boundary, as opposed to outside of it. This may result in a focus of activity away from a site if resources are available.

4.4 Summary of costs and benefits

Table 4.4 below summarises the potential costs and benefits of the site analysed in this section. The costs are analysed over a period of ten years from designation in 2012, and are discounted at 3.5% pa²⁶. There are uncertainties in the assessment of costs, and some costs have not been quantified.

²⁶ HM Treasury, The Green Book: http://www.hm-treasury.gov.uk/data_greenbook_index.htm

	Minimum management scenario	0	Maximum management scenar	io		
	Costs	Benefits	Costs	Benefits		
Assessed	Sectors	-	Sectors	-		
	Shipping: £0		Shipping: £0			
	Fishing: £0	-	Fishing: £124k.pa	Low-moderate: possible impacts		
	Government: Enforcement £12k.pa Management £77 one-off Ecological assessment £342k one-off, and £250k 'one-off'(every five years)	on scientific and non-use values.	Government: Enforcement £12k.pa Management £77 one-off Ecological assessment £342k one-off, and £250k 'one-off' (every five years)	on fish species, scientific and non-use values.		
Total annual	£12k pa	Low	£136k.pa	Low		
Total one-off	£669k		£669k			
Total (Present Value*)	£691k	Low-moderate	£1,514k	Low-moderate		
Not assessed	 Costs if any projects are refused Costs from cumulative MPA impacts and beyond next 10 years 	 Role of feature in wider ecosystem including suite of marine SACs. Intrinsic value of biodiversity improvements Ecosystem recovery beyond next 10 years 	 Costs if any projects are refused Costs from cumulative MPA Impacts and beyond next 10 years 	 Role of feature in wider ecosystem including suite of marine SACs. Possible benefits to fish and shellfish stocks. Intrinsic value of biodiversity improvements Ecosystem recovery beyond next 10 years 		

Table 4.4Summary costs and benefits table for Option 1: Designate the site.

(*this is the value over 10 years with the annual green book discount applied to costs occurring after 2012.)

Risk of unintended consequences

The main risks of unintended consequences are assessed to be the following:

- Fishermen may seek compensation for moving grounds;
- Displacement of fishing effort to alternative grounds may intensify fishing at those grounds to unsustainable levels, causing net damage to fish stocks overall.

Each of these risks is greater under the maximum scenario, and when considered cumulatively with other SAC designations and marine planning restrictions (e.g. MoD activity, shipping, fishing). Some of these risks can be mitigated by involving stakeholders in the process of designation through public consultation.

Under the habitats regulations and following an Appropriate Assessment, a Competent Authority can agree to a plan or project for imperative reasons of overriding public interest (even where a project would have an adverse effect on site integrity). Assessing such grounds would entail additional costs.

4.5 Impact tests

Consideration has been given within the main body of this assessment to relevant and identifiable environmental impacts and effects on sustainable development of designating Pobie Bank Reef pSAC.

The further tests specified by the IA guidance are considered here.

a) Competition assessment

This assessment, shown in Table 4.5 is restricted to the sectors where significant potential costs are identified in Table 4.4 above, namely fisheries and Government. The table analyses the impact of the maximum potential management measures that may be required. The maximum scenario is used to assess whether any significant impact is likely. Cumulative impacts of designation of Natura 2000 sites in the marine environment could have more significant effects on competition in some sectors. It is assumed that any management measures will apply equally to domestic and foreign operations.

The designation of the site is not expected to have a significant impact on competition.

Would the proposal:	Fisheries
1. Directly limit the number or range of suppliers?	No direct restrictions
2. Indirectly limit the number or range of suppliers?	 The main tests of this parameter are whether the policy is expected to: raise significantly the costs of new suppliers relative to existing suppliers, raise significantly the costs of some existing suppliers relative to other existing suppliers: or, raise significantly the costs of entering, or exiting, the affected market. In general these factors should not be realised although if some fishing gear types are considered more damaging than others management measures may impose restrictions on those gear types raising their costs relative to other gear types.
3. Limit the ability of suppliers to compete?	No restrictions on factors on which suppliers can compete.
4. Reduce suppliers' incentives to compete vigorously?	No reduction of incentive to compete.

Table 4.5Competition assessment for Pobie Bank Reef pSAC

b) Small firms impact test

Small and Medium Enterprises (SMEs) are considered for these purposes to be those with fewer than 250 employees. The industries potentially affected by the designation with a significant number of SMEs are related to fishing.

In the fishing industry it is likely that the fishing vessels that may be adversely affected by any additional management measures would be owned by SMEs and in most cases the company would not own more than one vessel. The number of fishing vessels affected would depend on the actual management measures implemented. Under the maximum scenario, the profitability of some small fishing businesses could potentially be affected. For example, their adaptations to the management measures for the site may increase costs, reduce value of landings or both.

Down-stream and up-stream effects in other sectors could also impact on SMEs, but impacted activities are likely to be displaced, at least partly to other locations in the UK economy, limiting the overall impact on SME's in the UK. For example, there are a number of SMEs which are directly and indirectly connected to the fishing sector, which could potentially be impacted on by designation. These include, retailers (fish mongers, markets) fish processing plants, ship builders and diesel suppliers.

c) Legal aid

No new criminal penalties are introduced by these proposals therefore we do not anticipate that there will be an impact on the Legal Aid Fund.

d) Carbon assessment

The impact of designating the site on greenhouse gas emissions is unknown but not expected to be significant. If fishing vessels have to travel longer distances to access alternative fishing grounds this would increase emissions depending on vessel size and whether they already operate over a variety of fishing grounds.

e) Rural proofing

Some of the economic costs identified in relation to fisheries may occur in remote coastal communities in predominantly rural areas of the UK. Due to the less diversified nature of their local economies, the potential impacts may be relatively more important as a proportion of economic activity in these locations.

f) Other impact tests

The effect of designating the site on health, disability, race, gender equality and human rights has been considered and it is not thought to have an impact. Consequently these impact tests are not examined further here.

5 CONCLUSIONS

This IA aims to provide stakeholders and Government with information on the benefits and impacts of the designation of Pobie Bank Reef pSAC. This assessment considered the impacts of Option 1 (designating the site) relative to the baseline (to not designate the site).

Designating this site will protect a reef habitat, and its associatied species, which have European biodiversity importance, from damage by marine industries. In addition to conservation of the local reef habitat there are wider network and strategic benefits on biodiversity through the Natura suite of marine SACs. (Establishing a network of protected sites is a key purpose of the Habitats Directive.) Healthy and diverse marine ecosystems underpin the sustainable delivery of ecosystem services beyond the next 10 years. These benefits are difficult to monitise and have been presented qualitatively. Designation of the site may also result in the restritiction of certain types of fishing and therefore potential

costs to fishers have been assessed. No other industries are likey to be impacted, but there are costs to Government in administering, enforcing and monitoring the proposed SAC.

As specific management measures for the site will be developed after the site has been designated it is necessary to make assumptions about the measures that might be required. This assessment analysed the impacts of a range of potential management scenarios. The reef is vulnerable to damage from demersal fishing, but we do not know if or the extent to which it is currently impacted. If not designated the reef would not be routinely surveyed and could be damaged by fishing in the future. The UK Government could risk infraction proceeding, and large fines from the EC, should this site not be designated.

The minimum management scenario involves the smallest change in activities that may be needed compared with the baseline and therefore presents the minimum potential effect on activities. The maximum scenario entails the largest change in activities that may be needed compared with the baseline and thereby presents the maximum potential effect on activities.

As Table 4.4 above shows, under Option 1 (for the 10 years of IA framework):

The minimum management scenario estimated total costs of £691k over ten years. There are higher costs under the maximum management scenario (£1, 514k). Indirect costs from potential fisheries losses have not been examined quantitatively. Both scenarios bring low to moderate benefits for non-use attributes and scientific research and knowledge; the maximum scenario also brings potential benefits for fish and shellfish.

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ANNEXES

ANNEX I: CALCULATIONS OF COSTS TO THE FISHING INDUSTRY BY GEAR TYPE 2
Otter trawls (bottom)
Distribution of UK-registered otter trawl (bottom) activity (hrs fished pa) (2007)
Distribution of UK-registered otter trawl (bottom) activity (hrs fished pa) (2008)
Distribution of UK-registered otter trawl (bottom) activity (hrs fished pa) (2009)
Scottish seine
Distribution of UK-registered Scottish seine activity (hrs fished pa) (2006)
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Distribution of UK-registered Scottish seine activity (hrs fished pa) (2009)
Otter twin trawls7
Distribution of UK-registered otter twin trawl activity (hrs fished pa) (2006)
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Distribution of UK-registered otter twin trawl activity (hrs fished pa) (2008)
Distribution of UK-registered otter twin trawl activity (hrs fished pa) (2009)
Pair trawls – bottom
Distribution of UK-registered bottom pair trawl activity (hrs fished pa) (2006)
Distribution of UK-registered bottom pair trawl activity (hrs fished pa) (2007)
Distribution of UK-registered bottom pair trawl activity (hrs fished pa) (2008)
Distribution of UK-registered bottom pair trawl activity (hrs fished pa) (2009)
Set gillnets (anchored)
Distribution of UK-registered anchored set gillnet activity (hrs fished pa) (2006)
Distribution of UK-registered anchored set gillnet activity (hrs fished pa) (2007)
Distribution of UK-registered anchored set gillnet activity (hrs fished pa) (2009)
Longlines (not specified)
Distribution of UK-registered longlining (unspecified) activity (hrs fished pa) (2006)
Distribution of UK-registered longlining (unspecified) activity (hrs fished pa) (2007)
ANNEX II: COSTS OF DESIGNATION OF POBIE BANK SAC BY SECTOR
FISHERIES 14
ENFORCEMENT and MONITORING

ANNEX I: CALCULATIONS OF COSTS TO THE FISHING INDUSTRY BY GEAR TYPE

The distribution of UK over 15m vessels that have a vessel monitoring systems (VMS) is shown below. Vessel monitoring systems provide a vessel's position, its speed and heading either hourly or every two hours. As vessels fish at characteristic speeds, VMS data can be processed to provide proxy patterns of 'active fishing' based on speed. This analysis is a coarse but effective means of estimating fishing effort¹, particularly for towed gear; it is less reliable for set gear such as pots and nets.

The data mapped here were generated by Cefas from VMS, log-book, and EU vessel register data for UK registered vessels in 2006-9². Fishing is estimated using a simple speed rule where 1-6 knots represents fishing activity. These data enabled fishing effort both inside and outside of the pSAC to be estimated by ICES rectangle: the value of catches from the pSAC could then be estimated by partitioning landings values for each rectangle accordingly. Maps of fishing activity for dominant gears are shown here (including pelagic gears). Calculations are only presented for vessels using demersal gear as these may be impacted by future management at the site. Landings data by ICES rectangle were sourced from Marine Scotland and the Marine Management Organisation; only landings data for UK registered vessels landing to UK ports are included in these analyses.

¹ Lee J, South, A B and Jennings, S. (2010) Developing reliable, repeatable, and accessible methods to provide high-resolution estimates of fishing-effort distributions from vessel monitoring system (VMS) data. ICES Journal of Marine Science 67:1260-1271.

² Cefas (2010) Report no. 1: Objective 1 – Provision of geo-database containing standardised layers showing the distribution of specified activities, sites and resources with associated metadata and comments. Project MB106: Further development of marine pressure data layers and ensuring the socio-economic data and data layers are developed for use in the planning of marine protected area networks

Pobie Bank Reef pSAC IA: Annexes

Landings by UK registered demersal fishing vessels to UK ports, partitioned by ICES rectangle and fishing effort over the site (Pobie Bank pSAC). (Some inconsistencies arise between VMS and landings data because of the different ways the data are collected.) Note that landings data are for all vessels while VMS data are only for vessels over 15m: for these calculations it has been assumed that all vessels fish in the same locations.

ICES	2006			2007			2008			2009			Average	
	Value	% of	Value	Value	% of	Value	Value	% of	Value	Value	% of	Value	% of	Value
	from	from	from	from	from	from	from	from	from	from	from	from	from	from
		site	Site (L)		site	Site (L)		site	Site (L)		site	Sile (L)	site	Site (L)
Otter tra	wl (bottom)									-				
50E9	2,257,031	12	280,824	2,560,265	8	202,329	3,343,395	8	259,929	3,238,515	7	237,601	9	245,171
49E9	1,560,720	3	42,245	1,068,186	2	24,457	1,388,072	5	72,490	896,251	5	47,724	4	46,729
TOTAL			323,070			226,786			332,420			285,325		291,900
Scottish	n seines											-	-	
50E9	469,453	3	15,134	997,731	2	19,326	1,035,357	3	27,246	838,237	1	12,255	2	18,490
49E9	582,891	1	7,241	389,701	1	5,710	582,862	5	26,816	371,867	2	8,121	2	11,972
TOTAL			22,375			25,035			54,063			20,376		30,462
Otter twin trawls														
50E9	130,993	5	6,127	274,407	5	14,216	598,266	4	24,164	573,994	5	27,789	5	18,074
49E9	70,705	3	2,299	33,004	9	3,130	69,554	10	7,073	103,987	3	3,190	6	3,923
TOTAL			8,426			17,346			31,238			30,979		21,997
Pair trav	vl (bottom)													
50E9	58,609	6	3,680	155,815	19	29,131	40,607	12	4,726	124,369	16	20,520	13	14,514
49E9	71,708	1	617	88,668	4	3,583	170,705	3	5,232	74,418	3	2,085	3	2,879
TOTAL			4,296			32,713			9,958			22,604		17,393
Set gilln	ets (anchor	ed)												
50E9	39,817	92	36,589	7,772	92	7,124	0	-	-	5,205	100	5,205	95	16,306
49E9	0	-	-	0	-		0	-	-	0	-	-	0	0
TOTAL 36,589				7,124			0			5,205		16,306		
Longlin	es (not spec	ified, - ass	sumed to b	pe static)				r	r	1	-	T	T	
50E9	36,909	90	33,203	0	-	-	8,782	0	-	2,464	0	-	30	33,203
49E9	3,265	36	1,166	28,471	20	5,827	0	-	-	2,397	0	-	19	3,497
TOTAL		34,369			5,827			0			0		36,700	

Otter trawls (bottom)

Distribution of UK-registered otter trawl (bottom) activity (hrs fished pa) (2006)



Distribution of UK-registered otter trawl (bottom) activity (hrs fished pa) (2007)



Distribution of UK-registered otter trawl (bottom) activity (hrs fished pa) (2008)



Distribution of UK-registered otter trawl (bottom) activity (hrs fished pa) (2009)



Scottish seine

Distribution of UK-registered Scottish seine activity (hrs fished pa) (2006)



Distribution of UK-registered Scottish seine activity (hrs fished pa) (2007)





Distribution of UK-registered Scottish seine activity (hrs fished pa) (2008)

Distribution of UK-registered Scottish seine activity (hrs fished pa) (2009)



Otter twin trawls

Distribution of UK-registered otter twin trawl activity (hrs fished pa) (2006)



Map projected in UTM (Zone 30N, WGS84 datum). World Vector shoreline © US Defence Mapping Agency. Map © JNCC 2012.

Distribution of UK-registered otter twin trawl activity (hrs fished pa) (2007)





Distribution of UK-registered otter twin trawl activity (hrs fished pa) (2008)

Map projected in UTM (Zone 30N, WGS84 datum). World Vector shoreline © US Defence Mapping Agency. Map © JNCC 2012.

Distribution of UK-registered otter twin trawl activity (hrs fished pa) (2009)



Pair trawls – bottom

Distribution of UK-registered bottom pair trawl activity (hrs fished pa) (2006)



Map projected in UTM (Zone 30N, WGS84 datum). World Vector shoreline © US Defence Mapping Agency. Map © JNCC 2012.

Distribution of UK-registered bottom pair trawl activity (hrs fished pa) (2007)



Distribution of UK-registered bottom pair trawl activity (hrs fished pa) (2008)



Distribution of UK-registered bottom pair trawl activity (hrs fished pa) (2009)



Set gillnets (anchored)

Distribution of UK-registered anchored set gillnet activity (hrs fished pa) (2006)



Map projected in UTM (Zone 30N, WGS84 datum). World Vector shoreline © US Defence Mapping Agency. Map © JNCC 2012.

Distribution of UK-registered anchored set gillnet activity (hrs fished pa) (2007)



There was no UK-registered anchored set gillnet activity over the site in 2008.



Distribution of UK-registered anchored set gillnet activity (hrs fished pa) (2009)

Longlines (not specified)

Distribution of UK-registered longlining (unspecified) activity (hrs fished pa) (2006)



Map projected in UTM (Zone 30N, WGS84 datum). World Vector shoreline © US Defence Mapping Agency. Map © JNCC 2012.



Distribution of UK-registered longlining (unspecified) activity (hrs fished pa) (2007)

$\label{eq:mapping} \mbox{Map projected in UTM (Zone 30N, WGS84 datum). World Vector shoreline @ US Defence Mapping Agency. Map @ JNCC 2012. \\$

There was no UK-registered anchored set gillnet activity over the site in 2008 or 2009.

ANNEX II: COSTS OF DESIGNATION OF POBIE BANK SAC BY SECTOR

FISHERIES

Minimum senario – no cost

Costs are calculated over the 10-year period using a discount rate of 3.5%, based on Green Book recommendations³.

Fisheries										
	Description		Or	ne-off Cost	Annual Cost					
Scenario Cost Item		Туре	Cost £k	Year Experienced	Cost £k	Year Commencing	Average			
MAXIMUM	Lost revenue due to closures	Policy			124	2014	87			
Total	Admin	0		0		0				
		Policy	0		124		87			
		Both	0		124		87			

Cost £k	Present Value	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
	824 0	0 0	0 0	116 0	112 0	108 0	104 0	101 0	97 0	94 0	91 0
Admin	0	0	0	0	0	0	0	0	0	0	0
Policy	824	0	0	116	112	108	104	101	97	94	91
Both	824	0	0	116	112	108	104	101	97	94	91

³ HM Treasury, The Green Book: http://www.hm-treasury.gov.uk/data_greenbook_index.htm

ENFORCEMENT and MONITORING

Minimum and maximum scenarios cost the same

Costs are calculated over the 10-year period using a discount rate of 3.5%, based on Green Book recommendations⁴.

Enforcement and monitoring										
Description	ı		One-off	Cost	Annua					
Scenario	Cost Item	Туре	Cost £k	Year Experienced	Cost £k	Year Commencing	Average			
вотн	Develop management measures	Policy	77	2012			-			
	Surveillance and monitoring	Admin			12	2014	8			
	Initial ecological Monitoring	Policy	342	2013			-			
	Ongoing ecological Monitoring	Admin	250	2018			-			
Total		Admin	250		12		8			
		Policy	419		-		-			
		Both	669		12		8			

Cost £k	Present Value	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
	77	77	0	0	0	0	0	0	0	0	0
	80	0	0	11	11	10	10	10	0	0	0
	80	U	0			10	10	10	9	9	9
	330	0	330	0	0	0	0	0	0	0	0
	203	0	0	0	0	0	0	203	0	0	0
Admin	283	0	0	11	11	10	10	213	9	9	9
Policy	407	77	330	0	0	0	0	0	0	0	0
Both	691	77	330	11	11	10	10	213	9	9	9

⁴ HM Treasury, The Green Book: http://www.hm-treasury.gov.uk/data_greenbook_index.htm