



Inshore Special Area of Conservation: Poole Bay to Lyme Bay

Draft Conservation Objectives and Advice on Operations



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1. Poole Bay to Lyme Bay pSAC: Draft conservation objectives and operations advice

1.1 Natural England's role

The Conservation (Natural Habitats &c.) Regulations 1994 transpose the Habitats Directive into law in Great Britain. It gives Natural England a statutory responsibility to advise relevant authorities as to the conservation objectives for European marine sites in England and to advise relevant authorities as to operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species for which the sites have been designated. This information will be a key component of the management schemes which may be developed for these sites.

This document is the foundation for Natural England's advice for the Poole Bay to Lyme Bay pSAC which will be issued in fulfilment of Regulation 33(2) of the Conservation (Natural Habitats &c.) Regulations 1994 (the 'Regulation 33 package') on adoption of the site as a candidate SAC by UK government.

In addition to providing such advice, the Regulation 33 package will inform the scope and nature of any 'appropriate assessment' which the Directive requires to be undertaken for plans and projects (Regulations 48 & 50 and by Natural England under Regulation 20). Natural England may also provide more detailed advice to competent and relevant authorities assessing the implications of any such plans or projects.

1.2 The role of relevant authorities

The Conservation (Natural Habitats &c.) Regulations 1994 require competent authorities to exercise their functions so as to secure compliance with the Habitats Directive. A single management scheme which the relevant authorities may draw up under Regulation 34 for the European marine site provides a framework through which this could be done and it should be based on the advice in this package. Relevant authorities must, within their areas of jurisdiction, have regard to both direct and indirect effects on interest features of the site. This may include consideration of issues outside the boundary of the site.

1.3 Activity outside the control of relevant authorities

Nothing within a Regulation 33 package will require relevant authorities to undertake any actions or ameliorate changes in the condition of interest features if it is shown that the changes result wholly from natural causes¹. Having issued Regulation 33 advice for European marine sites, Natural England will work with relevant authorities and others to agree, within a defined time frame, a protocol for evaluating observed changes to baselines and to develop an understanding of natural change and provide further guidance as appropriate and possible. This does not, however, preclude relevant authorities from taking any appropriate action to prevent deterioration to the interest features, and indeed such actions should be undertaken when required.

¹ Determination of what constitutes natural change will be based on the best available information and scientific opinion at the time.

1.4 Role of conservation objectives

Conservation objectives are the starting point from which management schemes and monitoring programmes may be developed as they provide the basis for determining what is currently or may cause a significant effect, and they informing the scope of appropriate assessments.

The conservation objectives set out what needs to be achieved for the site to make the appropriate contribution to the conservation status of the features for which the site is designated and thus deliver the aims of the Habitats Directive.

1.5 Role of advice on operations

The advice on operations set out in Section 3 provides the basis for discussion about the nature and extent of the operations taking place within or close to the site and which may have an impact on its interest features. The advice should also be used to help identify the extent to which existing measures of control, management and forms of use are, or can be made, consistent with the conservation objectives, and thereby focus the attention of relevant authorities and surveillance to areas that may need management measures.

This operations advice may need to be supplemented through further discussions with the Relevant Authorities and any advisory groups formed for the SAC.

1.6 Precautionary principle

All forms of environmental risk should be tested against the precautionary principle which means that where there are real risks to the site, lack of full scientific certainty should not be used as a reason for postponing measures that are likely to be cost effective in preventing such damage. It does not however imply that the suggested cause of such damage must be eradicated unless proved to be harmless and it cannot be used as a licence to invent hypothetical consequences. Moreover, it is important, when considering whether the information available is sufficient, to take account of the associated balance of likely costs, including environmental costs, and benefits (DETR & the Welsh Office, 1998).

2. Conservation objectives

2.1 Background to conservation objectives

The Conservation Objectives and definitions of favourable condition for features on the site may inform the scope and nature of any 'appropriate assessment' under the Habitats Regulations. An appropriate assessment will also require consideration of issues specific to the individual plan or project. The habitat quality definitions do not by themselves provide a comprehensive basis on which to assess plans and projects as required under:

- Regulations 20-21; 24; 48-50 and 54 – 85 of the Conservation (Natural Habitats &c.) Regulations 1994, generally referred to as the Habitat Regulations;
- Regulation 5 (1 – 4) of the Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001
- Regulations 6; 13(1); 18(3); 13(3); 19(3); 24 & Schedule 3 of the Environmental Impact Assessment and Natural Habitats (Extraction of Minerals by Marine Dredging) (England and Northern Ireland Regulations 2007).

The scope and content of an appropriate assessment will depend upon the location, size and significance of the proposed project. Natural England will advise on a case by case basis.

Following an appropriate assessment, competent authorities are required to ascertain the effect on the integrity of the site. The integrity of the site is defined in paragraph 20 of ODPM Circular 06/2005 (DEFRA Circular 01/2005) as the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified. The determination of favourable condition is separate from the judgement of effect upon integrity. For example, there may be a time-lag between a plan or project being initiated and a consequent adverse effect upon integrity becoming manifest in the condition assessment. In such cases, a plan or project may have an adverse effect upon integrity even though the site remains in favourable condition, at least in the short term.

The Conservation Objectives for European Sites under the Habitats Regulations are provided in accordance with paragraph 17 of ODPM Circular 06/2005 (DEFRA Circular 01/2005) which outlines the appropriate assessment process. The entry on the Register of European Sites gives the reasons for which a European Site was classified or designated.

2.2 Poole Bay to Lyme Bay pSAC Conservation objectives

Under Regulation 33(2)(a) of the Conservation (Natural Habitats &c.) Regulations 1994, Natural England has a duty to advise other relevant authorities as to the conservation objectives for the European marine site. The draft conservation objectives for the Poole Bay to Lyme Bay pSAC interest features are provided below. These are high level objectives for the site features, and Natural England may refine them in future as our understanding of the features improves. They should be read in the context of other advice given, particularly:

- the Site Assessment Document which provides more detailed information about the site and evaluates its interest features according to the Habitats Directive selection criteria and guiding principles;

- the summary favourable condition table, which further defines favourable condition for the interest feature.

2.2.1 The draft conservation objective for Annex 1 Reefs

Subject to natural change, maintain or restore the **Reefs** in / to favourable condition², in particular:

- Bedrock reefs
- Stony reefs
- Biogenic reefs

2.2.2 The draft conservation objective for Annex 1 Submerged or partially submerged sea caves

Subject to natural change, maintain the **Submerged or partially submerged sea caves** in favourable condition³.

² Favourable condition relates to the maintenance of the structure, function and typical species for that feature. A summary favourable condition table outlined in table 2.2 further defines favourable condition of the interest feature.

³ Favourable condition relates to the maintenance of the structure, function and typical species for that feature. A summary favourable condition table outlined in table 2.3 further defines favourable condition of the interest feature.

2.3 Background to favourable condition tables

The favourable condition table is the principle source of information that Natural England will use to assess the condition of an interest feature and as such comprises indicators of condition. Favourable condition tables will be drafted in detail on designation of the SAC and its adoption as a European marine site. This will involve the collation and quantification of a number of indicators of condition 'Attributes' which is a considerable task. For these draft objectives, an indication of the Attributes⁴ to be included in the condition table are given in tables 2.1 and 2.2, and this will form the basis for the condition monitoring process as described below.

On many terrestrial European sites, we know sufficient about the required condition of qualifying habitats to be able to define favourable condition with confidence. In contrast understanding the functioning of large, varied, dynamic marine and estuarine sites, which experience a variety of pressures resulting from historic and current activities, is much more difficult, consequently it is much harder to define favourable condition so precisely in such sites. In general the conservation objectives provided are based on a *working* assumption that the *current* condition of the features is favourable for most attributes. Nevertheless there are instances where the assumption does not apply, in particular some of the reef habitats of Lyme Bay have been subject to significant damage due to scallop dredging in the recent past. In such instances, where existing problems have been identified, this is reflected within the favourable condition table.

Where there are more than one year's observations on the condition of marine habitats, all available information will need to be analysed to determine, where possible, any natural environmental trends at the site. This will provide the basis for judgements of favourable condition to be determined in the context of natural change. Where it becomes clear that certain attributes may indicate a cause for concern, and if further investigation indicates this is justified, restorative management actions will need to be taken. The aim of such action would be to return the interest feature to favourable condition from any unfavourable state. Future editions of the advice within this document, produced by Natural England, will revise the current assumptions about feature condition in light of ongoing and future monitoring. This will be linked with any developments in our understanding of the structure and functioning of features and the pressures they are exposed to.

This advice also provides the basis for discussions with relevant authorities, and as such the attributes and associated measures and targets may be modified over time. The aim is to have a single agreed set of attributes that will be used as a basis for monitoring in order to report on the condition of features. Condition monitoring of the attributes may be of fairly coarse methodology, underpinned by more rigorous methods on specific areas within the site. To meet UK common standards, Natural England will be committed to reporting on each of the attributes listed in the final version of the table. This information may be generated by Natural England or collected by other organisations through agreements.

The favourable condition table will be an important, but not the only, driver of the site monitoring programme. Other data, such as results from compliance monitoring, (assessing the conduct of activities in relation to licence conditions, conducted by relevant / competent authorities and their statutory advisors), together with data

⁴ Selected characteristic of an interest feature/sub-feature which provides an indication of the condition of the feature to which it applies.

obtained to inform appropriate assessments, will also have an important role in assessing condition. The condition monitoring programme will be developed through discussion with the relevant / competent authorities and other interested parties, ideally as part of the management scheme process. Natural England will be responsible for collating the information required to assess condition, and will form a judgement on the condition of each feature within the site. The condition assessment will take into account all available information using the favourable condition table to guide the process.

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Table 2.1 indication of attributes to be used in defining favourable condition for Annex I reef in the Poole Bay to Lyme Bay pSAC

Favourable condition tables will be drafted in detail on designation of the SAC and its adoption as a European marine site

Attribute	Target	Comments
Extent	No reduction in extent of reef allowing for natural change.	While changes in extent may be unlikely due to low / removal of the bedrock reef itself, loss of extent may occur due to excessive smothering by sediment as part of natural coastal processes or anthropogenic activity.
Biotope composition of the bedrock, stony, and biogenic reefs	Maintain the full variety of biotopes identified for the site (see table 2.2), allowing for natural succession or known cyclical change.	Where changes in biotope composition are known to be attributable to natural processes (e.g. winter storm/flood events, changes in supporting processes or mass recruitment or dieback of characterising species) then the target value should accommodate this variability. Where a change in biotope composition occurs outside the expected variation, or a loss of the conservation interest of the site is identified, then condition should be considered unfavourable.
Distribution of biotopes: Spatial arrangement of bedrock, stony, and biogenic reef biotopes at specified locations	Maintain the distribution of biotopes, allowing for natural succession/known cyclical change.	Where changes in distribution/spatial pattern are known to be clearly attributable to cyclical succession or an expected shift in distribution then the target value should accommodate this variability. Where a change in biotope distribution/spatial pattern occurs outside the expected variation or a loss of the conservation interest of the site is identified, then condition should be considered unfavourable.
Extent of bedrock, stony, and biogenic reef or representative /notable biotopes including: CR.HCR.XFa.ByEr Sp.Eun CR.FCR.Cv.SpCu p	No change in the extent of the biotope(s) allowing for natural succession/known cyclical change	Where a change in extent outside the expected variation occurs or a change in the structure of the biotope leading to a loss of the conservation interest of the site is identified, then condition should be considered unfavourable.
Species composition of representative or notable biotopes including: CR.HCR.XFa.ByEr Sp.Eun CR.FCR.Cv.SpCu p	No decline in biotope quality due to change in species composition or loss of notable species allowing for natural succession/ known cyclical change. Where declines in biotope quality have occurred due	Where changes in species composition are known to be clearly attributable to natural succession, known cyclical change or mass recruitment or dieback of characterising species, then the target value should accommodate this variability. Where there is a change in biotope quality outside the expected variation or a loss of the conservation interest of the site, then condition should be considered unfavourable.

Attribute	Target	Comments
	to damage from scallop dredging, these declines will need to be reversed.	
Species population measures: Population structure of individual species including: <i>Leptopsammia pruvoti</i> , <i>Aiptasia mutabilis</i> , <i>Eunicella verrucosa</i> , <i>Caryophyllia inornata</i> , <i>Hoplangia durotrix</i> .	Maintain age/size class structure of individual species populations. Where declines in age/size class structure of individual species populations have occurred due to damage from scallop dredging, these declines will need to be reversed.	Whilst some change in community structure over time is expected (for example, as part of cyclic changes or successional trends) changes in the overall nature of reef communities, including mobile species e.g. fish, crustacean species etc, may indicate deterioration in the condition of the biodiversity of the reef community. Species selected for monitoring should reflect the specific biological characteristics or key conservation interest of the designated site.

Table 2.2 indication of attributes to be used in defining favourable condition for Annex I Submerged or partially submerged sea caves in the Poole Bay to Lyme Bay pSAC

Favourable condition tables will be drafted in detail on designation of the SAC and its adoption as a European marine site

Attribute	Target	Comments
Number of caves in site	No reduction in the number of caves within a site allowing for natural change.	Where caves are irrevocably lost due to natural processes such as erosion, the attribute will be considered partially destroyed, or even destroyed, however if due to natural erosion dynamics this would still be considered as a natural succession.
Extent of cave(s)	No change in dimensions of a cave, allowing for natural change that are part of a wider coastal geomorphological management regime.	Where changes in extent/dimensions are clearly attributable to cyclical natural processes such as erosion causing rock falls, then the final assessment will require expert judgement to determine the reported condition of the feature.
Biotope composition of caves	Maintain the full variety of biotopes identified for the caves, allowing for natural succession or known cyclical change.	Biotope composition of a cave is tightly linked to the prevailing physical and environmental conditions of the cave. It will vary between caves and therefore no single generic target can be specified for the entire feature where this includes multiple caves. Where changes in biotope composition are known to be attributable to natural processes (e.g. winter storm/flood events, changes in supporting processes or mass recruitment or dieback of characterising species) then the target value should accommodate this variability. The final assessment will require expert judgement to determine the reported condition of the feature.

Attribute	Target	Comments
		Where there is a change in biotope composition outside the expected variation or a loss of the conservation interest of the site, then condition should be considered unfavourable.

Table 2.3 Reef communities which occur within the Poole Bay to Lyme Bay pSAC (From Haskoning 2008)

Biotope (from Connor <i>et al</i> 2004)		Bedrock reef	Stony reef	Biogenic reef*
IR.MIR.KR.LhypT.PK	<i>Laminaria hyperborea</i> park and foliose red seaweeds on moderately exposed lower infralittoral rock	*		
CR.MCR.EcCr.FaAlCr.Adig	<i>Alcyonium digitatum</i> , <i>Pomatoceros triqueter</i> , algal & bryozoan crusts	*	*	
CR.HCR.XFa.ByErSP	Bryozoan turf and erect sponges on tide-swept circalittoral rock	*		
CR.HCR.Xfa.ByErSp.Eun	<i>Eunicella verrucosa</i> and <i>Pentapora foliacea</i> on wave-exposed circalittoral rock	*		
CR.MCR.EcCr.FaAlCr	Faunal and algal crusts on exposed to moderately wave exposed rock	*		
CR.MCR.EcCr.FaAlCr.Pom	Faunal and algal crusts with <i>Pomatoceros triqueter</i>		*	
CR.MCR.EcCr.FaAlCr.Flu	<i>Flustra foliacea</i> on slightly scoured silty rock	*		
CR.HCR.XFa.FluCoAs.SmAs	<i>Flustra foliacea</i> , small solitary and colonial ascidians		*	
CR.HCR.Xfa	Mixed faunal turf communities	*		
CR.HCR.Xfa.ByErSp.Sag	Mixed turf of bryozoans and erect sponges with <i>Sagartia elegans</i> on tide-swept circalittoral rock	*		
CR.MCR.CMus.Cmyt	<i>Mytilus edulis</i> with hydroids and ascidians on tideswept rock			*
SS.SCS.CCS.PomB	<i>Pomatoceros triqueter</i> with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles		*	
CR.FCR.Cv.SpCp	Sponges, cup corals and anthozoans on shaded overhanging circalittoral rock	*		
SS.SBR.PoR.SspiMx	<i>Sabellaria spinulosa</i> on stable circalittoral mixed sediment			*

3. Advice on operations

Natural England has a duty under Regulation 33(2)(b) of the Conservation (Natural Habitats &c.) Regulations 1994 to advise other relevant authorities as to any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated.

The advice is provided in summary form in table 3 with more detail in Appendix B. Sections 3.6.1 to 3.7.2 provide advice in relation to specific interest features and their sub-features.

3.1 Purpose of advice

The aim of this advice is to enable all relevant authorities to direct and prioritise their work on the management of activities that pose the greatest potential threat to the favourable condition of interest features on the Poole Bay to Lyme Bay pSAC. The advice is linked to the conservation objectives for interest features and will help provide the basis for detailed discussions between relevant authorities enabling them to formulate and agree a management scheme for the site should one be deemed necessary.

The advice given here will inform on, but is given without prejudice to, any advice provided under Regulation 48 or Regulation 50 on operations that qualify as plans or projects within the meaning of Article 6 of the Habitats Directive.

3.2 Methods for assessment

To develop this advice on operations Natural England has used a three step process involving:

- an assessment of the **sensitivity** of the interest features or their component sub-features to operations;
- an assessment of the **exposure** of each interest feature or their component sub-features to operations; and
- a final assessment of **current vulnerability** of interest features or their component sub-features to operations.

This three step process builds up a level of information necessary to manage activities in and around the European marine site in an effective manner. Through a consistent approach, this process enables Natural England to both explain the reasoning behind our advice and identify to competent and relevant authorities those operations which pose the most current threats to the favourable condition of the interest features on the site.

All the scores of relative sensitivity, exposure and vulnerability are derived using best available scientific information and informed scientific interpretation and judgement. The process uses sufficiently coarse categorisation to minimise uncertainty in information, reflecting the current state of our knowledge and understanding of the marine environment.

3.2.1 Sensitivity assessment

The sensitivity assessment used is an assessment of the relative sensitivity of the interest features or the component sub-features, i.e. Bedrock, Stony, and Biogenic Reefs and Sea caves, of the Poole Bay to Lyme Bay pSAC to the effects of broad categories of human activities. In relation to this assessment, sensitivity has been defined as the intolerance of a habitat, community or individual (or individual colony) of a species to damage, or death, from an external factor (Hiscock, 1996). Sensitivity is dependent on the intolerance of a species or habitat to damage from an external factor and the time taken for its subsequent recovery. For example, a very sensitive species or habitat is one that is very adversely affected by an external factor arising from human activities or natural events (killed/destroyed, 'high' intolerance) and is expected to recover over a very long period of time, i.e. >10 or up to 25 years ('low'; recoverability). The sensitivity of the interest sub-features was based on the sensitivities of their component biotopes, listed in Table 2.3. Biotope sensitivities were derived from the Marine Life Information Network (MarLIN) biology and sensitivity database (Tyler-Walters & Hiscock, 2003). Biotope sensitivities were assessed using the MarLIN approach (Hiscock & Tyler-Walters, 2005, 2006; Tyler-Walters et al., 2001). Sensitivities are available from the MarLIN website (www.marlin.ac.uk).

3.2.2 Exposure assessment

This has been undertaken for the Poole Bay to Lyme Bay pSAC by assessing the relative exposure of the interest features or their component sub-features on the site to the effects of broad categories of human activities currently occurring on the site (as at July 2008). These assessments were made on the basis of the best available information and advice.

3.2.3 Vulnerability assessment

The third step in the process is to determine the vulnerability of interest features or their component sub-features to operations. This is an integration of sensitivity and exposure. Only if a feature is both sensitive and exposed to a human activity will it be considered vulnerable. In this context therefore, 'vulnerability' has been defined as the exposure of a habitat, community or individual (or individual colony) of a species to an external factor to which it is sensitive (Hiscock, 1996). The process of deriving and scoring relative vulnerability is provided in Appendix A.

3.3 Format of advice

The advice is provided within six broad categories of operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species. This approach therefore:

- enables links to be made between human activities and the ecological requirements of the habitats or species, as required under Article 6 of the Habitats Directive;
- provides a consistent framework to enable relevant authorities in England to assess the effects of activities and identify priorities for management within their areas of responsibility; and

- is appropriately robust to take into account the development of novel activities or operations which may cause deterioration or disturbance to the interest features of the site and should have sufficient stability to need only infrequent review and updating by Natural England.

These broad categories provide a clear framework against which relevant authorities can assess activities under their responsibility.

3.4 Update and review of advice

Information as to the operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated, is provided in light of what Natural England knows about current and recent activities and patterns of usage at the Poole Bay to Lyme Bay pSAC. Natural England expects that the information on activities and patterns of usage (which was used to derive Table 3) will be refined as part of the process of developing the management scheme and through discussion with the relevant authorities. As part of this process the option of identifying a number of spatial zones with different activity levels may be appropriate. It is important that future consideration of this advice by relevant authorities and others takes account of changes in the usage patterns that have occurred at the site, over the intervening period, since the information was gathered. In contrast, the information provided in this advice on the sensitivity of interest features or sub-features is relatively stable and will only change as a result of an improvement in our scientific knowledge, which will be a relatively long term process. Advice for sites will be kept under review and will be periodically updated through discussions with relevant authorities and others to reflect significant changes in our understanding of sensitivity together with the potential effects of plans and projects on the marine environment.

3.5 Plans and Projects

Under the regulations:

- Regulation 48(1) of the Conservation (Natural Habitats, &c.) Regulations 1994,
- Regulation 5 of the Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 and
- Schedule 3, paragraph 2 of the Environmental Impact Assessment and Natural Habitats (Extraction of Minerals by Marine Dredging) (England and Northern Ireland) Regulations 2007,

an appropriate assessment needs to be undertaken in respect of any plan or project which:

- a. either alone or in combination with other plans or projects would be likely to have a **significant effect** on a European Site; and
- b. is not directly connected with the management of the site for nature conservation.

A site that is being considered for designation as a SAC under the Habitats Directive becomes a European site for the purposes of the above Regulations at the point in time at which it is proposed to the Commission by the secretary of State or a Devolved Administration as a site eligible for designation as a SAC. On submission, the site becomes known in the UK as a candidate SAC (cSAC).

Whilst there is no obligation in domestic law to make this assessment in respect of a site prior to it becoming a cSAC, it should be considered a matter of good practice for Competent Authorities, before deciding to undertake or permit a plan or project, to assess its implications for sites such as this, whose proposed details are in the public domain, in accordance with the process described in Article 6.3 of the Habitats Directive. In doing so, a Competent Authority will be reducing the likelihood of the UK jeopardising the fulfilment of its obligations under the Habitats Directive. Further, without pre-judging any review of extant consents that may be required by the Habitats Regulations, undertaking *such an assessment* and determining any consents in accordance with it, will reduce the uncertainty for developers who are granted consent but have not fully implemented it by the time the site becomes a cSAC.

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4. Specific advice on operations for the Poole Bay to Lyme Bay pSAC

The following sections provide information to help relate general advice to each of specific interest features for the Poole Bay to Lyme Bay pSAC.

This advice relates to the vulnerability of the interest features and sub-features of the Poole Bay to Lyme Bay pSAC as summarised in Table 3 and detailed in the Tables in appendix B. Further explanation of the sensitivity of the interest features or sub-features follows with examples of their exposure and therefore their vulnerability to damage or disturbance from the listed categories of operations. This enables links to be made between the categories of operation and the ecological requirements of the features.

This advice relates to the vulnerability of the interest features and sub-features of the Poole Bay to Lyme Bay pSAC to current levels of human usage (as at July 2008).

Table 3: Summary of operations which may cause deterioration or disturbance of Poole Bay to Lyme Bay pSAC interest features at current levels of use

The advice below is not a list of prohibitions but rather a checklist for operations which may need to be subject to some form of management measures(s) or further measures where actions are already in force. Examples of activities under relevant authority jurisdiction are also provided. Operations marked with a ✓ indicate those features (or some component of them) that are considered to be vulnerable to the effects of the operations.

Operations which may cause deterioration or disturbance	Poole Bay to Lyme Bay pSAC reefs	Poole Bay to Lyme Bay pSAC sea caves
Physical loss Removal (e.g. capital dredging, offshore development) Smothering (e.g. by aggregate dredging, disposal of dredge spoil)	 ✓ ✓	
Physical damage Siltation (e.g. run-off, channel dredging, outfalls) Abrasion (e.g. boating, anchoring, demersal fishing) Selective extraction (e.g. aggregate dredging)	 ✓ ✓ 	 ✓ ✓
Non-physical disturbance Noise (e.g. boat activity) Visual (e.g. recreational activity)	 	
Toxic contamination Introduction of synthetic compounds (e.g. pesticides, TBT, PCBs) Introduction of non-synthetic compounds (e.g. heavy metals, hydrocarbons) Introduction of radionuclides	 ✓ ✓ 	
Non-toxic contamination Changes in nutrient loading (e.g. agricultural run-off, outfalls) Changes in organic loading (e.g. mariculture, outfalls) Changes in thermal regime (e.g. power stations)	 ✓ ✓ 	 ✓

Operations which may cause deterioration or disturbance	Poole Bay to Lyme Bay pSAC reefs	Poole Bay to Lyme Bay pSAC sea caves
Changes in turbidity (e.g. run-off, dredging)	✓	
Changes in salinity (e.g. water abstraction, outfalls)		(✓)
Biological disturbance		
Introduction of microbial pathogens	✓	
Introduction of non-native species and translocation	✓	
Selective extraction of species (e.g. bait digging, wildfowling, commercial & recreational fishing)	✓	

4.1 Reefs

4.1.1 Physical loss

All the reef sub-features are sensitive to loss through direct removal or smothering. The loss of any of the reef communities would be of concern due to their ecological importance within the reef habitat and their long recovery times to this form of disturbance. Many communities that use the reef habitats are interdependent upon the ecological functioning of others (for example, invertebrate communities and fish) and it is important that this potential indirect effect is considered when the effects of removal or smothering are assessed. The biogenic reefs (*Sabellaria spinulosa* and *Mytilus edulis*) are moderately sensitive to physical loss due to removal as re-establishment of the reef may take considerable time.

Static gear fishing is known to occur, particularly around the Isle of Portland, and this activity is likely to result in minor habitat loss of the biogenic reef features. Some damage is reported of the biogenic *Sabellaria* reef features off Swanage (Royal Haskoning 2008), this is thought to be as a result of fishing activity, with acoustic data showing extensive trawl scars in the area. Thus biogenic reef is considered to have medium exposure to physical loss, the other reef sub-features are considered to be exposed to low levels of physical loss due to smothering from demersal trawling in adjacent areas of sediment.

Overall the vulnerability of reef sub-features within the Poole Bay to Lyme Bay pSAC to physical loss is considered to be low to moderate.

4.1.2 Physical damage

Physical damage to softer bedrock and areas of boulder / pebble reef can result in degradation to the structure of the reef. Therefore stony reef communities are considered to be moderately sensitive to physical damage through abrasion. The key, indicative bedrock reef species are commonly delicate slow growing, species that rely on recruitment from the immediate surrounding waters. Therefore, any direct disturbance to an area may not only result in direct mortality but also impact on the success of the surrounding population. Therefore the bedrock reef features are considered highly sensitive to physical damage. The biogenic reefs (*Sabellaria*

spinulosa and *Mytilus edulis*) are moderately sensitive to physical damage as re-establishment of the reef may take considerable time.

Fishing activity has occurred extensively in the Lyme Bay area up until July 2008 as a result of increases in the commercial value of scallops (Devon Wildlife Trust, *pers.comm.*). The effects of scallop dredging have resulted in the degradation of the physical structure of the soft bed rock and cobble reef as well as biota they support. Following the establishment of a statutory closed area and introduction of conservation measures, exposure to physical damage to reef, particularly bedrock reef, in some areas of the site is reduced, however its overall exposure is still considered as medium as areas outside the closure boundary are still exposed to potential damage. Survey data documents some damage to sea fan colonies having occurred in inshore areas where trawling does not occur, but may be due to impacts from static fishing gear. There are records of significant damage / degradation to the areas of reef sub-features associated with the *Sabellaria* features off Swanage (Royal Haskoning, 2008) due to fishing activity, with acoustic data showing extensive trawl scars in the area. These areas are not included in the fishery closure and the exposure of the biogenic and stony reef subfeatures which are less represented within the area of the closure is considered to be high.

Overall the vulnerability of reef sub-features within the Poole Bay to Lyme Bay pSAC to physical damage is considered to be high.

4.1.3 Toxic contamination

The dominant reef biotopes are likely to be of intermediate intolerance to chemical contamination and recover relatively quickly once the contamination is removed. However, where red algae dominated communities occur in the bedrock and stony reefs, sensitivity is likely to be higher as red algae are noted to be sensitive to chemical contamination. Although the kelp *Laminaria hyperborea* is relatively tolerant, the sensitivity suggested reflects the intolerance of the red algae.

Shipping accidents still occur leading to pollution and physical wreckage. Given the amount of shipping in the vicinity of the site boundary, potential exposure to toxic contamination from shipping is considered to be low.

Overall the vulnerability of reef sub-features within the Poole Bay to Lyme Bay pSAC to toxic contamination is considered to be low.

4.1.4 Non-Toxic contamination

The dominant biotopes are likely to be of low sensitivity to nutrient enrichment but where red algae dominated communities occur on the bedrock and stony reefs, sensitivity is likely to be higher. As above, the sensitivity suggested reflects the intolerance of the red algae. Some biotopes within the sub-features are sensitive to increases in turbidity (loss of light) caused by inputs from land, or dredge spoil dumping. The dominant kelp communities are unlikely to be particularly sensitive, however where faunal and algal turfs occur sensitivity is likely to be higher. The *Laminaria hyperborea* dominated biotopes are likely to be of moderate sensitivity to increase in turbidity. The long-lived, fragile species of the bedrock reef are intolerant of reduced oxygenation due to organic enrichment and are therefore considered highly sensitive to non-toxic contamination.

Due to the proximity of the reef sub-features to the coast, they are currently exposed to low levels of non-toxic contamination from land based discharges.

Overall the vulnerability of reef sub-features within the Poole bay to Lyme Bay pSAC to non-toxic contamination is considered to be low to moderate.

4.1.5 Biological disturbance

Biological disturbance includes the introduction of pathogens or non-native species as well as selective extraction of species from the ecosystem. Removal of fish species and larger molluscs and crustaceans can have significant impacts on the structure and functioning of benthic communities over and above the physical effects of fishing methods. Sensitivity of reef sub-features to such fishing is considered to be high for the bedrock reef communities present within the site; moderate for the stony reef sub feature and low for biogenic reef.

Fishing activity has occurred extensively in this area up until July 2008 as a result of increases in the commercial value of scallops (Devon Wildlife Trust, *pers.comm.*). The effects of scallop dredging has resulted in the degradation of reef structure as well as biota. Following the establishment of statutory closed areas and introduction of conservation measures, exposure to biological disturbance due to trawling in these areas is reduced. Nevertheless the relatively high incidence of potting for crab, lobster and whelk within the statutory closure and other types of fishing outside it suggests that the overall exposure to selective extraction may be considered high (Walmsley & Pawson, 2007).

Overall the vulnerability of reef sub-features within the Poole bay to Lyme Bay pSAC to biological disturbance is considered to be moderate to high.

4.2 Sea Caves

4.2.1 Physical damage

Physical damage to caves can either occur in the form of siltation or abrasion. Whilst the communities are highly sensitive to abrasion, exposure to an activity which would cause abrasion is considered to be insignificant, although a few instances of vandalism to accessible caves have been reported. Due to the proximity of the caves to the coast, some siltation will occur, which may cause some smothering of the communities, however both sensitivity and exposure to siltation is considered to be low.

Overall the vulnerability of sea caves within the Poole bay to Lyme Bay pSAC to physical damage is considered to be low.

4.2.2 Toxic contamination

Although Sea cave communities may be exposed to some toxic contamination e.g. from pollution incidents or chronic inputs, the sensitivity of the communities is not well characterised. Therefore, there may be some vulnerability, but this has not been documented for this feature.

4.2.3 Non-Toxic contamination

Due to the proximity of the sea caves to the coast, they are currently exposed to low levels of non-toxic contamination from land based discharges. Some of the filter feeding organisms present in the sea cave communities are intolerant of reduced oxygenation due to organic enrichment and are therefore considered moderately sensitive to non-toxic contamination.

Many sea caves in Torbay have specific and varied salinities and therefore may be considered highly sensitive to changes in salinity. However, their exposure to such changes is not currently well defined.

Overall the vulnerability of the sea caves within the Poole bay to Lyme Bay pSAC to non-toxic contamination is considered to be low.

DRAFT

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Appendix A Methods deriving vulnerability.

Sensitivity	
None	-
Low	•
Moderate	••
High	•••

Exposure	
None	-
Low	+
Medium	++
High	+++

Vulnerability	
None detectable	
Low	
Moderate	
High	

The relative vulnerability of an interest feature or sub-feature is determined by multiplying the scores for relative sensitivity and exposure, and classifying that total into categories of relative vulnerability.

		Relative sensitivity of the interest feature			
		High (3)	Moderate (2)	Low (1)	None detectable (0)
Relative exposure of the interest feature	High (3)	9	6	3	0
	Medium (2)	6	4	2	0
	Low (1)	3	2	1	0
	None (0)	0	0	0	0

Categories of relative vulnerability	
High	6-9
Moderate	3-5
Low	1-2
None detectable	0

Appendix B

Assessment of the relative vulnerability of interest features and sub-features of the Poole Bay to Lyme Bay pSAC to different categories of operations (for key see appendix A)

Operations which may cause deterioration or disturbance	Annex I Reefs									Annex I sea caves		
	Bedrock reef			Stony reef			Biogenic reef			Sea caves		
	Sensitivity	Exposure	Vulnerability	Sensitivity	Exposure	Vulnerability	Sensitivity	Exposure	Vulnerability	Sensitivity	Exposure	Vulnerability
Physical loss												
Removal (e.g. harvesting, coastal development)	•••	-	-	••	-	-	••	++	Moderate	•••	-	
Smothering (e.g. by artificial structures, disposal of dredge spoil)	••	+	Low	•	+	Low	•	+	Low	•••	-	
Physical damage												
Siltation (e.g. run-off, channel dredging, outfalls)	•	+	Low	•	+	Low	-	+		•	+	Low
Abrasion (e.g. boating, anchoring, trampling)	•••	++	High	••	+++	High	••	+++	High	•••	-	Low
Selective extraction (e.g. aggregate dredging)	-	-	-	•	-	-	-	-	-	-		
Non-physical disturbance												
Noise (e.g. boat activity)	-	+	-	-	+	-	-	+	-	-		
Visual (e.g. recreational activity)	-	+	-	-	+	-	-	+	-	-		
Toxic contamination												
Introduction of synthetic compounds (e.g. pesticides, TBT, PCBs)	•	+	Low	••	+	Low	•	+	Low	Insufficient information	+	-
Introduction of non-synthetic compounds (e.g. heavy metals, hydrocarbons)	•	+	Low	••	+	Low	•	+	Low	Insufficient information	+	-

Operations which may cause deterioration or disturbance	Annex I Reefs									Annex I sea caves		
	Bedrock reef			Stony reef			Biogenic reef			Sea caves		
	Sensitivity	Exposure	Vulnerability	Sensitivity	Exposure	Vulnerability	Sensitivity	Exposure	Vulnerability	Sensitivity	Exposure	Vulnerability
Introduction of radionuclides	Insufficient information	-	-	Insufficient information	-	-	Insufficient information	-	-	Insufficient information		
Non-toxic contamination												
Changes in nutrient loading (e.g. agricultural run-off, outfalls)	••	+	Low	••	+	Low	•	+	Low	Insufficient information	+	-
Changes in organic loading (e.g. mariculture, outfalls)	•••	+	Moderate	••	+	Low	•	+	Low	••	+	Low
Changes in thermal regime (e.g. power stations)	••	-	-	•	-	-	•	-	-	•••	-	-
Changes in turbidity (e.g. run-off, dredging)	•	+	Low	•	+	Low	-	+	-	Insufficient information		-
Changes in salinity (e.g. water abstraction, outfalls)	•••	-		••	-	-	•	-	-	•••	Insufficient information	Insufficient information
Biological disturbance												
Introduction of microbial pathogens	•	+	Low	••	+	Low	•	+	Low	Insufficient information	-	-
Introduction of non-native species and translocation	•	+	Low	Insufficient information	+	-	•	+	Low	•	-	-
Selective extraction of species (e.g. bait digging, wildfowling, commercial & recreational fishing)	•••	+++	High	••	+++	High	•	+++	Moderate	•••	-	-