Lizard Point
candidate Special Area of Conservation

Formal advice under Regulation 35(3) of The Conservation of Habitats and Species Regulations 2010

Version 2.0 (July 2012)

Document version control

Version	Author	Amendments made	Issued to and date
2.0	Rhiannon Pipkin	Amendments to version control; amendment to text in footnote 15c (section 3.2.4) which was not relevant to this site; removal of duplicate text from section 3.3; Appendix F – formatting changes; update of page numbers; Section 4.3.1 text amendments to only refer to subfeatures present in this site; Appendix D update to provide consistency with Appendix E amendments.	Relevant Authorities 24/07/2012
1.4	Rhiannon Pipkin	Update of page numbers. **Standard text updates to bring consistency between packages,** i.e. removal of reference to further baseline data collected in 2010 on P. 1; reference to independent review of evidence added to P. 1; link to protocol on Natural England website added; Section 2.1 – transposition of law into England and Wales; Section 2.2 – competent authority text updated, link added to 'Assessment of implications for European sites and European offshore marine sites'; Section 3.2 – hyperlink added to SAD, FCT text updated; Section 3.2.4 – update of natural change, maintain, restore, and favourable condition footers; Section 3.3 – standard text updated; Section 4.3 – paragraph removed for consistency; Section 5 – sentence added referring to Appendix E; section 5.1 – 'annex I habitat' added, paragraph added to explain process used; Appendix E updated to include 'non-physical disturbance, include footnotes, and updated definitions; Appendix F updated with footnote.	Sam King 20/07/2012
1.3	Rhiannon Pipkin	Minor grammatical changes following MMT sign off.	Paul Duncan 25/04/2012
1.2	Rhiannon Pipkin	Amendments to exposures for the flat bedrock reef and offshore upstanding reefs for non-toxic contamination; and smothering for all features, following relevant authority comments. Amendments made in section 5 and Appendix E.	Marine Management Team and Director Marine for sign off 11/04/2012
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0.2	Rhiannon Pipkin	Date amendments	Evidence team (Rob Enever and James Bussel) 18/05/2011
0.1	Rhiannon Pipkin	Update of Lizard Point draft conservation objectives; text updated, full FCT table included, appendices added.	Evidence team 21/04/2011

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Lizard Point candidate Special Area of Conservation

Formal advice under Regulation 35(3) of The Conservation of Habitats and Species Regulations 2010 (S.I., 2010)[1]

Contents

[1] http://www.legislation.gov.uk/uksi/2010/490/made

1. Introduction

This document contains Natural England's formal advice for Lizard Point candidate Special Area of Conservation (cSAC) given under Regulation 35(3) of The Conservation of Habitats and Species Regulations 2010. This document supersedes the previous draft conservation advice for Lizard Point proposed SAC (pSAC).

Lizard Point was formally submitted by the Government to the European Commission as a cSAC on 20 August 2010. Lizard Point cSAC is with the European Commission awaiting 'moderation' (that is an assessment alongside all the other sites submitted by other Member States). If the European Commission approves the site, it becomes a Site of Community Importance and Government then has six years to designate it as a SAC.

The cSAC is subject to full protection under the Habitats Directive[2] (transposed through the Conservation of Habitats and Species Regulations 2010[3] and the Offshore Marine Conservation Regulations (Natural Habitats, &c.) (Amendment) Regulations 2010 (herein referred to as the 'Habitats Regulations'). Amongst other things, the Habitats Regulations place an obligation on relevant authorities[4] to put in place measures to protect sites from damage or deterioration.

This document fulfils Natural England's duty under Regulation 35(3)[5] of The Habitats Regulations, to advise relevant authorities as to (a) the conservation objectives for Lizard Point: and (b) any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which Lizard Point has been designated.

This advice is based on best available information at the time of writing.

This formal conservation advice constitutes one element of our advisory role in relation to this site. Relevant authorities can use the current information to explore and put in place management measures (if required) and competent authorities[6] can fulfil their duties under the Habitats Regulations in making the necessary determinations on the impact of activities on the site. However, should relevant authorities or competent authorities require any further advice, they are not limited to taking account of Natural England's formal conservation advice contained here, and would be expected to make further enquiries as required in order to make determinations or implement management measures. Further information/reference should be made to the Selection Assessment Document (Natural England, 2010a)[7] for Lizard Point pSAC which is still relevant to the cSAC.

An independent review of Natural England's marine SAC selection process carried out in 2011 made a number of recommendations as to how Defra and Natural England should modify their approach to future evidence based work. This resulted in Natural England adopting the Government Chief Scientific Adviser's (GCSA) guidelines on using evidence, through the development of a suite of Evidence Standards. Implementation of these standards has included Natural England working with JNCC to develop a protocol, which has been subject to independent expert review, setting out the processes and requirements for

[2] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
[3] http://www.legislation.gov.uk/uksi/2010/490/contents/made
[4] as defined under Regulation 6 of The Conservation of Habitats and Species Regulations 2010
[5] http://www.legislation.gov.uk/uksi/2010/490/regulation/35/made
[6] as defined under Regulation 7 of The Conservation of Habitats and Species Regulations 2010
[7] http://www.naturalengland.org.uk/Images/Lizard-sad_tcm6-21662.pdf

the development of conservation advice packages, to ensure that these fully comply with the GCSA's guidelines. Whilst the conservation advice provided here was developed prior to the finalisation of the protocol, it has been assessed for compliance with the protocol and a detailed report can be found on our website (http://www.naturalengland.org.uk/Images/R35ConservationAdvicePackageProtocol_tcm6-33228.pdf).

2. Roles and responsibilities

2.1 Natural England's role

The Habitats Regulations transpose the Habitats and Birds Directive into law in England and Wales. They give Natural England a statutory responsibility to advise relevant authorities as to the conservation objectives for cSACs, SACs and SPAs in English territorial waters (0-12nm) 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.

Natural England will provide additional advice as required for each site to relevant and competent authorities in order for them to fulfil their duties under the Habitats Regulations, such as a competent authority assessing the implications of any plans or projects on a cSAC, SAC, or SPA.

2.2 The role of relevant and competent authorities

A **competent** authority is a public authority whose decision making may have an impact on the Natura 2000[8] series and therefore needs to be subject to the Regulations. All competent authorities are required to have regard for the requirements of the Habitats Directive in the exercise of their functions (regulation 9(3)).

Competent authorities have specific duties and powers under the Habitats Regulations. Where a decision is being considered within or affecting a Natura 2000 site, then the competent authority must follow the procedures in Regulations 61 & 62. Competent authorities also have duties under Regulations 69 & 70 for the review of decisions that have already been made. These Regulations refer back to the procedures set out in Regulation 61.

The competent authority carries out the appropriate assessment and makes a decision on integrity rather than the proponent of the plan or project or Natural England. Regulation 61(2) makes it clear that the applicant has to supply the necessary information for the competent authority to make the assessment. The competent authority can require the proponent to provide sufficient information to inform the assessment. When carrying out the assessment, the competent authority **must** consult Natural England in accordance with the Habitats Regulations.

The Habitats Regulations require relevant 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 36[9] of the Habitats Regulations, will provide a framework through which this could be done and it should be based on the advice

[8] SACs and SPAs are together referred to as Natura 2000 sites or (in the marine environment) European Marine Sites.

[9] http://www.legislation.gov.uk/uksi/2010/490/regulation/36/made

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.

Nothing within a Regulation 35 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 causes. Having issued Regulation 35 advice for this site, 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.

2.3 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 causing or may cause a significant effect, and they inform 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.

In addition this advice will inform the scope and nature of any 'appropriate assessments[10]' which the Directive requires to be undertaken for plans and projects (Regulations 61 and 63 of the Habitats Regulations for inshore waters).

2.4 Role of advice on operations

The advice on operations set out in Section 4 of this document 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 advice on operations may need to be supplemented through further discussions with the relevant authorities and any advisory groups formed for the site.

2.5 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 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

[10] Assessment of implications for European sites and European offshore marine sites

information available is sufficient, to take account of the associated balance of likely costs, including environmental costs, and benefits (DETR & the Welsh Office, 1998).

3. Conservation objectives

3.1 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[11]. An appropriate assessment will also require consideration of issues specific to the individual plan or project.

The scope and content of an appropriate assessment will depend upon the location, size, and significance of the proposed plan or 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)[12] 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 this site 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 site was classified or designated.

3.2 Lizard Point cSAC conservation objectives

The formal conservation objectives for Lizard Point cSAC 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 and further information becomes available, such as survey work. They should be read in the context of other advice given, particularly:

- the Selection Assessment Document[13], which provides more detailed information about the site and evaluates its interest features according to the Habitats Directive selection criteria and guiding principles;

- the Favourable Condition Table (Appendix A and Table 4.1) providing information on how to recognise favourable condition for each of the features and which will act as a basis from which the monitoring programme will be developed; and

[11] Regulation 61 and 63 by a competent authority and Regulation 21 by Natural England

[12] http://www.communities.gov.uk/documents/planningandbuilding/pdf/147570.pdf

[13] http://www.naturalengland.org.uk/Images/Lizard-sad_tcm6-21662.pdf

- the attached maps (Appendix B) which show the known locations of the interest features

3.2.1 Importance of features

Lizard Point has been formally submitted to the European Commission by the Government as a cSAC for its Annex I Reef features. Ecological subdivisions for Annex I Reef include bedrock, stony, and biogenic reefs (JNCC, 2009). Variations of bedrock reefs include; upstanding reefs, defined as 'high to medium topographic complexity' (for example reefs with gullies, strong vertical features, or which are undulating); and flat reefs of 'low topographic complexity' (JNCC, 2009). Bedrock reef communities are areas of protruding rock, colonised by a suite of flora and fauna. A transition of communities can occur from the near surface sunlit zone, dominated by plants, such as kelp forests and red seaweeds, to the deeper waters where a variety of fauna inhabit, including echinoderms, sponges, corals, anemones, bryozoans and crustaceans.

Lizard Point is the most southerly point on mainland Great Britain. The coastal upstanding rocky reef extends out to around 2 kilometres offshore and extends along the coastal margin for a distance of around 24 kilometres from Pedngwinian Point in the west to Carrick Luz in the east. The coastline is characterised by rock cliffs inset with a few sandy coves. The site is exposed to the full force of the Atlantic, and experiences full salinity conditions given the absence of any freshwater land runoff (Axelsson & Dewey, 2011; Birchenough et al., 2008).

Lizard Point has an unusual variety of bedrock origins. Both the coastal and offshore areas consist of submerged bedrock and boulders of complex geological origin, interspersed by extensive areas of thin, coarse mobile sediment overlying flat sedimentary bedrock to the south and east, and the flat metamorphic bedrock to the west (Birchenough et al., 2008). The exposed upstanding rocky reef extends to around 7 kilometres offshore in depths from 0 – 80 metres. This variety of bedrock is unique to the Lizard Point cSAC with no other SAC in the area having a similar underlying geology (Birchenough et al., 2008). The fauna of particular note in the site include *Eunicella verrucosa, Alcyonium glomeratum* and *Corynactis viridis*, but also large numbers of *Pentapora fascialis* throughout (Axelsson & Dewey, 2011). Algae cover much of the exposed infralittoral rock, whilst the tideswept circalittoral rock surfaces are populated mostly by suspension feeding species, notably the soft corals such as dead-man's fingers *Alcyonium digitatum*, ascidians, particularly *Dendrodoa grossularia*, sea anemones including jewel anemones *Corynactis viridis,* sandaled anemones *Actinothoe sphyrodeta* and Devonshire cup coral *Caryophyllia smithii*, as well as encrusting and massive sponges, especially the rock-boring *Cliona cellata* at greater depths (Birchenough et al., 2008).

Horizontal circalittoral rock surfaces no deeper than ~25 m can also sustain foliose red and brown algae such as *Drachiella spectabilis*, *Deleseria sanguinea* and *Dictyopteris membranacea*. Deeper and more sheltered aspects are often covered with a thin organic veneer of hydroids, encrusting sponges and bryozoans, as well as erect examples such as the Oaten pipes hydroid *Tubularia indivisa*, sea chervil *Alcyonidium diaphanum,* Ross coral *Pentapora fascialis* and occasionally the pink sea-fan priority BAP species, *Eunicella verrucosa* (Birchenough et al., 2008). 'Fragile sponge and anthozoan communities on rock habitats' (a habitat included in the UK Biodiversity Action Plan list of priority habitats; UKBAP, 2008) is also found in Lizard Point cSAC, particularly on tideswept circalittoral rock surfaces (Axelsson & Dewey, 2011).

Motile fauna occurring throughout the reef include high concentrations of large echinoderms such as *Echinus esculentus*, the cotton spinner sea cucumber *Holothuria forskali*, and common and spiny star fish *Asterias rubens* and *Marthasterias glacialis*, as well as

European spiny lobster *Palinurus elephas*, squat lobster *Munida rugosa,* edible brown crab *Cancer pagarus*, and the cuckoo wrasse *Labrus mixtus* (Birchenough et al., 2008).

3.2.2 Reefs

Definition

Reefs are structures that rise from the seabed and can be formed of either biogenic concretions (i.e. a structure created by the animals themselves, such as mussels), or of geogenic origin (i.e. where animal or plant communities grow on raised or protruding rock). They are predominantly subtidal, but may extend as an unbroken transition into the intertidal (littoral) zone, where they are exposed to the air at low tide. A variety of subtidal seafloor features are included in the reef habitat complex, such as hydrothermal vent habitats, sea mounts, vertical rock walls, horizontal ledges, overhangs, pinnacles, gullies, ridges, sloping or flat bedrock, broken rock and boulder and cobble fields. Reefs may support a zonation of seafloor communities of algae and animal species. Only a few invertebrate species are able to develop biogenic reefs, which are therefore restricted in distribution and extent (Brown et al., 1997).

Rocky reef types are extremely variable, both in structure and in the communities they support. The specific communities that occur vary according to a number of factors. Exposure to wave action has a major effect on community structure, as does rock type with communities on the granite reefs being markedly different to those occurring on chalk reefs. Light intensity, which varies with depth, also has a major effect on community structure. Consequently, shallow water communities are dominated by seaweeds, whilst deeper rock surfaces are colonised purely by attached animals. Another major factor affecting reef communities is the turbidity of the water. In turbid waters, light penetration is low and algae can occur only in shallow depths or in the intertidal zone. However, in such conditions, animals have a plentiful supply of suspended food and filter-feeding species may be abundant. In addition, in the UK there is a marked geographical trend in species composition related to seawater temperature, with warm, temperate species such as the sea fan *Eunicella verrucosa* and the coral *Leptopsammia pruvoti* only occurring in southern waters.

There are three main types of Annex I reef: bedrock reef; stony reef[14] (bedrock and stony reef are collectively referred to as geogenic reef); and biogenic reef. Current evidence shows geogenic reef to be present within Lizard Point cSAC (Axelsson & Dewey, 2011; Birchenough et al., 2008).

3.2.3 Key reef sub-features of Lizard Point cSAC

Sub-features have been identified based on the reports of Axelsson & Dewey, 2011 and Birchenough et al., 2008.

Offshore upstanding reef communities

[14] To qualify as a stony reef, 10% or more of the seabed substratum should be composed of particles greater than 64mm across, i.e. cobbles and boulders. The remaining supporting 'matrix' could be of smaller sized material. The reef may be consistent in its coverage or it may form patches with intervening areas of finer sediment. Stony reefs are dominated by epifaunal communities rather than infaunal species and are elevated from the seabed and stable (Irving, 2009). By its nature, stony reef is more vulnerable to being moved than bedrock reef, but due to the interstitial spaces and hard surfaces of coarse particles, is capable of harbouring a rich variety of species, including corals, anemones, and sponges.

The offshore upstanding rocky reef at Lizard Point is important despite the relatively modest extent (2,394 ha; Birchenough et al, 2008). This distinct area of the site comprises two regions of offshore upstanding rocky reef known as “The Boa“ and “Carn Andra“ which extend about 3.5 to 9 km (about 2 to 5 nm) offshore, and down to depths of 80 metres. There are also numerous lesser peaks in this area. The reefs are good examples of wave exposed and tide swept reefs of the lower and upper circalittoral, the shallowest of which support foliose red seaweeds and the deeper typically consist of anemones, sponges, and solitary corals (Birchenough et al., 2008). Species present include *Corynactis viridis*, *Bugula, Scrupocellaria, Cellaria, Caryophyllia smithii, Pentapora fascialis,* and *Urticina felina* (Axelsson & Dewey, 2011; Birchenough et al., 2008).

Coastal upstanding reef communities

The coastal upstanding reef covers approximately 2,280 hectares (ha) (Birchenough et al., 2008). Along this section of the Lizard Point cSAC, algae cover much of the exposed infralittoral rock. The coastal margin is characterised by kelp-dominated biotopes, with communities typically consisting of a canopy of the kelps *Laminaria saccharina* and *Laminaria hyperborea,* with an understory of foliose red, green and brown algae including *Dilsea carnosa, Dictyopteris polypodioides, Delesseria sanguine* and *Drachiella spectabilis*. The edible sea urchin *Echinus esculentus* is the most conspicuous epifauna in this zone (Birchenough et al., 2008). In terms of the biological assemblages inhabiting the upstanding coastal rocky reefs, there is some difference between those on the west and east of Lizard Point, given the differences in the relative exposure and energy levels, with communities on the west conforming to ‘High Energy’ and those on the east to ‘Moderate Energy’ (Axelsson & Dewey, 2011; Birchenough et al., 2008). The pink sea fan *Eunicella verrucosa* is found at greater depths (Axelsson & Dewey, 2011; Birchenough et al., 2008).

Flat bedrock reef communities

Between the coastal margin and offshore upstanding reefs lies an area of flat bedrock reef which rings the whole of the Lizard Point. The area of flat bedrock reef covers approximately 7,921 ha (Birchenough et al., 2008). This area is fairly diverse in terms of its habitats, spanning the infralittoral and circalittoral zones, with both high and moderate-energy communities represented (Birchenough et al., 2008). Kelp, mixed faunal turfs, echinoderms, and crustose communities dominate through this sub-feature. Species present include *Eunicella verrucosa, Corynactis viridis, Caryophyllia smithii, Drachiella spectabilis, Delesseria sanguine, Dictyopteris polypoidioides, Dictyota dichotoma* and/or *Dictyopteris membranacea, Bugula*, *Scrupocellaria*, and *Cellaria* (Axelsson & Dewey, 2011; Birchenough et al., 2008). Tide-swept circalittoral rock surfaces are populated mostly by suspension feeding species whereas horizontal circalittoral rock surfaces in less than 25 m support foliose red and brown algae.

3.2.4 The conservation objectives for Lizard Point Annex 1 Reefs:

Survey work was commissioned in 2010 to develop the baseline data for Lizard Point cSAC and to assess the condition of the Annex I reefs for which the site has been designated. These new surveys support the findings of Birchenough et al. (2008), of excellent structure and conservation of function, with no evidence of habitat damage as a result of anthropogenic activity (Axelsson & Dewey, 2011). A number of stations surveyed by Birchenough et al. (2008) were also revisited in 2010. These showed no evidence of any anthropogenic impacts and the biological habitat to be similar in 2010 to those seen in 2007. The conclusion from these comparisons is that the reef features identified remain unchanged and are all in excellent condition (Axelsson & Dewey, 2011).

Therefore, based on the results of Birchenough et al. (2008) and Axelsson & Dewey (2011), Lizard Point cSAC Annex I reefs have been given the following conservation objective of ***maintain***. If evidence later shows an activity to be negatively affecting the conservation objectives of the site, then the site will be deemed to be in unfavourable condition and restorative action will needed.

Subject to natural change[a], maintain[b] the reefs in favourable condition[15]**,** in particular the sub-features**:**

Offshore upstanding reef
Coastal upstanding reef
Flat bedrock reef

Favourable condition of the reefs will be determined through assessment that the following are maintained in the long term in the site:

1. Extent of the habitat
2. Diversity of the habitat and it's component species
3. Community structure of the habitat (e.g. population structure of individual notable species and their contribution to the functioning of the ecosystem)
4. Natural environmental quality (e.g. water quality, suspended sediment levels, etc.)
5. Natural environmental processes (e.g. biological and physical processes that occur naturally in the environment, such as water circulation and sediment deposition should not deviate from baseline at designation)

The favourable condition table (Appendix A) further defines favourable condition for the interest features/sub-features of the site.

[15] **Explanation of terms used in the Conservation Objectives**

a) Natural change refers to changes in the habitat which are not a result of human influences. Human influence on the interest features is acceptable provided that it is proved to be/can be established to be compatible with the achievement of the conditions set out under the definition of favourable condition for each interest feature. A failure to meet these conditions, which is entirely a result of natural process will not constitute unfavourable condition, but may trigger a review of the definition of favourable condition. Features should not necessarily be considered in unfavourable condition when caused by the short term disappearance of a particular community due to natural processes.

b) Maintain implies that existing evidence suggests the feature to be in favourable condition and will, subject to natural change, remain at its condition at designation. Existing activities are therefore generally considered to be sustainable and be unlikely to adversely affect the condition of the feature if current practices are continued at current levels. However, it must be borne in mind that gradually damaging activities can take time to show their effects. If evidence later shows an activity to be negatively affecting the conservation objectives of the site, then the site will be deemed to be in unfavourable condition and restorative action will needed.

c) Favourable condition relates to the maintenance of the structure, function, and typical species for that feature within the site.

d) Restore implies that the feature is degraded to some degree and that activities will have to be managed to reduce or eliminate negative impact(s). Restoration in the marine environment generally refers to natural recovery through the removal of unsustainable physical, chemical and biological pressures, rather than intervention (as is possible with terrestrial features).

3.3 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. The favourable condition table can be found at Appendix A.

On many terrestrial European sites, we know sufficient information 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, and consequently it is much harder to define favourable condition so precisely in such sites. It must be borne in mind that gradually damaging activities can take time to show their effects. If evidence later shows an activity to be negatively affecting the conservation objectives of the site, then the site will be reassessed in light of this new information and restorative action put in place if needed.

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. This document will be revised in light of ongoing and future monitoring of the condition of designated features within the site. 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. Common Standards Monitoring (JNCC 2004) requires mandatory monitoring of some attributes of a designated feature, while other attributes are considered discretionary (or site-specific) and are incorporated to highlight local distinctiveness. Priority will be given to measuring attributes that are at risk from anthropogenic pressure and for which changes in management may be necessary. This information may be generated by Natural England or collected by other organisations through agreements.

Whilst the favourable condition table is the key source of information of condition for site features additional source of information may also be selected to inform our view about the integrity and condition of the site. For example, a part of risk based monitoring activity data (as collected by the relevant authorities) will give an indication as to the levels of pressure that may impact on the site features.

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, including other data on site integrity / condition that has been gathered by others for purposes such as appropriate assessment, licence applications etc. using the favourable condition table to guide the process.

4. Advice on operations

4.1 Background

Natural England has a duty under Regulation 35(3)(b) of the Habitats Regulations (S.I., 2010) 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.

As part of its advice on operations Natural England has considered the pressures that may be caused by activities and the vulnerability of the sites interest features to those pressures.

The following sections provide information to help relate general advice to each of the specific interest features for the Lizard Point cSAC to current levels of human usage. This is aimed at being a broad assessment of pressures and the vulnerability of features.

This advice relates to the vulnerability of the interest features and sub-features of the Lizard Point cSAC. The process of deriving and scoring relative vulnerability is provided in Appendix C. A summary of the pressures which may cause deterioration or disturbance is given in Appendix D, and detailed in Appendix E. 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 pressures. This enables links to be made between the categories of pressure and the ecological requirements of the features.

4.2 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 at Lizard Point cSAC. 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, but is given without prejudice to, any advice provided under Regulation 61 or Regulation 63 on operations that qualify as plans or projects within the meaning of Article 6 of the Habitats Directive.

4.3 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 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.

4.3.1 Sensitivity assessment

The sensitivity assessment used is an assessment of the relative sensitivity of the interest features or the component sub-features, i.e. offshore upstanding reef; coastal upstanding reef; and flat bedrock reef to the 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 long period of time, i.e. >10 or up to 25 years ('low' recoverability).

The sensitivity of the interest features was based on the sensitivities of their component biotopes, listed in Appendix F. Biotope sensitivities were derived from the Marine Life Information Network (MarLIN)[16] biology and sensitivity database (Tyler-Walters and Hiscock, 2003) and the JNCC. Biotope sensitivities were assessed using the MarLIN approach (Hiscock and Tyler-Walters, 2005, 2006; Tyler-Walters et al., 2001). Sensitivities are available from the MarLIN and JNCC websites (www.marlin.ac.uk, www.jncc.defra.gov.uk).

4.3.2 Exposure assessment

This has been undertaken for Lizard Point cSAC 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. These assessments were made on the basis of the best available information and advice.

Appendix E shows the relative exposure of the Lizard Point cSAC's sub-features to physical, chemical and biological pressures. This assessment is based on known human activities operating in or adjacent to the site, and the anticipated pressures associated with these activities.

4.3.3 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).

[16] www.marlin.ac.uk

4.4 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.

4.5 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 Lizard Point cSAC. Natural England expects that the information on activities and patterns of usage will be refined as part of the process of developing the management scheme and/or 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.

5. Specific advice on operations for Lizard Point cSAC

The following sections provide information to help relate general advice to each of the specific interest features for Lizard Point cSAC.

This advice relates to the vulnerability of the interest features and sub-features of the Lizard Point cSAC as summarised in Appendix D and detailed in the Appendix E. 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 Lizard Point cSAC to current levels of human usage.

Appendix E shows the vulnerability assessments for the sub-features of the Lizard Point cSAC.

5.1 Annex I habitat Reefs

The sensitivity of the three site subfeatures has been assessed using evidence for the biotopes and species present in the site (as outlined in Appendix F) and information available on the MarLIN website. The biotopes and species listed in Appendix F were recorded on the noted subfeatures of this site (Axelsson & Dewey, 2011; Birchenough et al., 2008).

5.1.1 Physical loss

All the reef sub-features: offshore upstanding reef; coastal upstanding reef; and flat bedrock reef, are moderate to highly 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. Where species such as *Pentapora fascialis,* or *Antedon bifida* occur, they are likely to be more sensitive as smothering will interfere with their feeding structures.

Although the reef sub-features are moderately to highly sensitive to physical loss, at current levels of exposure they are currently considered 'not vulnerable' to removal and 'not vulnerable' to 'low vulnerability' to smothering.

Overall the **vulnerability** of **reef sub-features** within the Lizard Point cSAC to **physical loss** is considered to be **none-low**.

5.1.2 Physical damage

All reef sub-features are sensitive to physical damage. A number of the reef biotopes are slightly sensitive to increased siltation, however they can withstand low levels of siltation as has been observed on the site.

All reef sub-features are also moderately to highly sensitive to physical damage by abrasion or selective extraction (i.e. displacement of the organism from the substratum and from its original position), which may result from shipping activities, anchoring, or deployment/recovery of fishing gear. Flat bedrock reef and coastal upstanding reef habitats include occurrences of the pink sea fan *Eunicella verrucosa.* Due to its poor recoverability, *E. verrucosa* biotopes will be markedly more sensitive to physical damage where it occurs.

Shipping has the potential to impact the site in a detrimental way for despite the many measures provided to promote and assist shipping safety (e.g. lighting, buoyage and a traffic separation scheme) accidents still occur leading to pollution and physical damage.

Physical disturbance to reefs could be significant if targeted by towed fishing gears such as scallop dredges. However, there is currently very little trawling or dredging at the site (Natural England, 2010b). Mainly seasonal vessels work in the site, using pots, tangle nets, gill nets, or handlines (Natural England, 2010b). Handlining will not result directly in

abrasion (abrasion could potentially only occur through anchoring of the vessel), but potting and netting could result in some abrasion of the seabed or displacement of species. Overall exposure to physical damage through abrasion and physical selective extraction is therefore considered to be moderate.

Overall the **vulnerability** of **reef sub-features** within the Lizard Point cSAC to **physical damage** is considered to be **moderate, or high** where *Eunicella verrucosa* occurs.

Monitoring undertaken in 2010 demonstrates the reef sub-features to be in excellent condition (Axelsson & Dewey, 2011), with delicate species such as *Pentapora fascialis* abundant across the features, and a conservation objective of maintain has therefore been given. Existing low impact activities are therefore generally considered to be sustainable and be unlikely to adversely affect the condition of the feature *if current practices are continued at current levels.* If evidence later shows an activity to be negatively affecting the conservation objectives of the site, then the site will be deemed to be in unfavourable condition and restorative action will needed.

5.1.3 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 offshore and coastal upstanding 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 (Holt et al., 1995), 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, and recent increases in the usage of Falmouth Bay, taking account of the associated risks potential exposure to toxic contamination from shipping is considered to be moderate.

Overall the **vulnerability** of **reef sub-features** within the Lizard Point cSAC to **toxic contamination** is considered to be **moderate**.

5.1.4 Non-Toxic contamination

Discharges of pollution from the land could potentially impact on interest features in the site by causing changes in physico-chemical conditions of the overlying water, such as changes in temperature, turbidity, salinity, and increases in nutrient and organic matter.

The dominant biotopes are likely to be of low sensitivity to nutrient enrichment but where kelp dominated communities occur (e.g. IR.HIR.KFaR.LhypR.Ft) sensitivity is likely to be higher, as eutrophication is associated with a reduction in the depth range of this species (Birkett et al., 1998). Changes in organic loading can cause changes in oxygenation. Reef communities in the cSAC show generally a low-moderate sensitivity to this factor, however this is higher in regions where *Eunicella verrucosa* is present. Some biotopes within the sub-features are sensitive to increases in turbidity (loss of light) caused by inputs from land, for example IR.HIR.KFaR.FoR, as photosynthetic capability would be reduced for algae, and reduce the food available to suspension feeders. Faunal and algal turfs are also likely to have higher sensitivities.

The high dilution that any land-based discharge is likely to receive however would reduce the risk of these having an impact (Natural England, 2010b). Run off of pollutants from the adjacent land is also likely to be low because most of the land adjacent to Lizard Point is

National Nature Reserve or owned by the National Trust, and water quality is reported to be good (Natural England, 2010b). Exposure is therefore considered to be 'not exposed' for the flat bedrock reefs and offshore upstanding reefs, and moderate for the coastal upstanding reefs, due to their proximity to land.

The reef biotopes show moderate sensitivity to changes in thermal regime. However, there is no known activity in the cSAC that would cause a change in thermal regime, and therefore exposure to this operation and subsequently vulnerability, is considered negligible/none. Sensitivity to changes in salinity is assessed as moderate to high. Exposure to this factor is considered low for the coastal upstanding reefs (due to the proximity to any potential outfalls) and negligible/none for the flat bedrock reef and offshore upstanding reef.

Overall the **vulnerability** of **reef sub-features** within the Lizard Point cSAC to **non-toxic contamination** is considered to be **none-moderate**.

5.1.5 Biological disturbance

Biological disturbance includes the introduction of pathogens or non-native species as well as selective extraction of species from the ecosystem.

For many reef communities, insufficient information is available to determine their sensitivity to microbial pathogens. Echinoderm populations have been reported to be adversely affected by diseases, although no reports of mass mortality have been recorded in the UK (MarLIN, 2011). A precautionary sensitivity of low has been suggested for the introduction of microbial pathogens, with a low exposure to this factor. Vulnerability is therefore considered to be low for all three subfeatues.

With regards to the introduction of non-native species, there is currently insufficient information available to determine the sensitivity of many reef communities and species to this effect. Concern has increased over recent years however for the potential impacts of the alien sea squirt *Didemnum vexillum*, which can overgrow most hard substrata in the sub-tidal zone and can include bedrock, pebbles, cobbles, gravel, boulders, biogenic reef and other hard bodied sessile animals and plants. Main transport pathways of *Didemnum vexillum* include recreational boating and aquaculture (Laing et al., 2010). Due to the proximity of Lizard Point cSAC to the Fal & Helford (a recreational boating and aquaculture area), an exposure assessment of moderate has been given, and the reef sub-features are considered to be moderately vulnerable to introduction of non-native species and translocation.

Selective extraction refers to the removal of the species or community. This includes either the removal of a specific species/community/keystone species in a biotope, or the removal of a required host or prey for the species under consideration. Any effects of the extraction process on the habitat itself are addressed under other factors, e.g. displacement, abrasion and physical disturbance, and substratum loss. *Eunicella verrucosa* (present on the coastal upstanding reef and flat bedrock reef) is considered highly sensitive to selective extraction, due to its slow growth and low recovery rates, however, this species is not known to be specifically targeted for extraction in the site.

Removal of fish species and larger molluscs can have impacts on the structure and functioning of benthic communities over and above the physical effects of fishing methods. For example, removal of urchin predators such as lobsters or crawfish has been implicated in increases in urchin populations and therefore the creation of 'urchin barrens' and the loss of kelp beds (Birkett et al., 1998). However, the evidence is equivocal as sea urchin barrens

occur in areas where lobsters are not found (Birkett et al., 1998), and it is likely that there is a complex interaction between sea urchin recruitment and predation (MarLIN, 2011). Communities in the site that could be impacted by these potential effects include the *Laminaria hyperborea* forests and parks, which have a moderate sensitivity to selective extraction. The cSAC is actively used for; potting for lobsters and crabs; netting mainly for anglerfish, turbot, ray, brill, crawfish, lobster, spider crab, brown crab, pollack, cod, bass, red mullet, and sole; and handlining targeting bass, pollack, and mackerel during spring and summer months (Natural England, 2010). All three sub-features are therefore believed to be moderately exposed to selective extraction, and moderately to highly vulnerable.

Overall the **vulnerability** of **reef sub-features** within the Lizard Point cSAC to **biological disturbance** is considered to be **low-high**.

However, monitoring undertaken in 2010 demonstrates the reef sub-features to be in excellent condition (Axelsson & Dewey, 2011), including regions where *Eunicella verrucosa* or kelp forests are present, and a conservation objective of maintain has therefore been given. Existing low impact activities are therefore generally considered to be sustainable and be unlikely to adversely affect the condition of the feature *if current practices are continued at current levels.* If evidence later shows an activity to be negatively affecting the conservation objectives of the site, then the site will be deemed to be in unfavourable condition and restorative action will needed.

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Appendix A

Favourable Condition Table (FCT) for Lizard Point cSAC
Common Standards Monitoring (CSM) attributes were selected from JNCC (2004). Additional attributes were selected on a discretionary basis.

(See Appendix F for description of biotope codes used)

Feature: Reefs
Sub-feature: General

Attribute	Measure	Target	Comment
Extent of reefs (Mandatory CSM attribute)	Overall area (ha) of reefs measured periodically throughout the reporting cycle.	No decrease in extent from established baseline, subject to natural change. *Baseline established by Birchenough et al. (2008) and supplemented by Axelsson & Dewey (2011)*	Extent of reef is a reporting requirement of the Habitats Directive. While changes in extent may be unlikely due to removal of the rock reef itself, loss of extent may occur due to excessive smothering by sediment as part of natural coastal processes or anthropogenic activity. The chart in appendix B shows the mapped extent of the feature.
Water Clarity (Discretionary CSM attribute)	Average light attenuation measured periodically throughout the reporting cycle.	Average light attenuation should not deviate significantly from an established baseline, subject to natural change. *Baseline to be established. Data from EA may assist.*	Water clarity is a key process influencing algal/plant dominated biotopes. Changes in water clarity could be caused, for example, by an increase in suspended material due to organic enrichment.

Attribute	Measure	Target	Comment
Water Density (Discretionary CSM attribute)	Average temperature and salinity measured periodically in the subtidal, throughout the reporting cycle.	Average temperature and salinity should not deviate significantly from an established baseline, subject to natural change. *Baseline to be established. Data from EA may assist.*	Temperature and salinity are characteristic of the overall hydrography of the area, indicating predominance of coastal or oceanic water. Changes in temperature and salinity may influence the presence and distribution of species (along with recruitment processes and spawning behaviour) particularly those species at the edge of their geographic ranges. Where changes in temperature or salinity through adverse impacts e.g. thermal discharge plumes, industrial discharges, water abstraction etc. cause a severe loss or shift in community structure such that the conservation interest is adversely affected then condition should be judged as unfavourable. Where changes in temperature or salinity are due to natural processes such as severe winter temperatures, then this will be an acceptable change to the feature.

Attribute	Measure	Target	Comment
Sedimentation rate (Discretionary CSM attribute)	Average sedimentation rate measured periodically in the subtidal, throughout the reporting cycle	Average sedimentation rate should not deviate significantly from an established baseline, subject to natural change. *Baseline to be established.*	Where adverse anthropogenic impacts such as dredging, disposal of dredge spoil or changed water flows due to artificial structures cause a change in sedimentation rate leading to severe smothering of the rock habitat, or an adverse shift in community structure, then condition should be judged as unfavourable. Where changes in sedimentation rate are attributable to natural processes such as storm events, changed tidal movements or dynamics, or natural erosion, then this will be an acceptable change to the feature unless the conservation interest is lost.

Feature: Reefs
Sub-feature: Offshore Upstanding Reefs

Attribute	Measure	Target	Comment
Extent of offshore upstanding reefs (Mandatory CSM attribute)	Overall area (ha) of offshore upstanding reefs measured periodically throughout the reporting cycle.	No decrease in extent from established baseline, subject to natural change. *Baseline established by Birchenough et al. (2008) and supplemented by Axelsson & Dewey (2011).*	Extent of reef is a reporting requirement of the Habitats Directive. While changes in extent may be unlikely due to 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. The chart in appendix B shows the mapped extent of the sub-feature.

Attribute	Measure	Target	Comment
Biotope composition of offshore upstanding reefs (Mandatory CSM attribute)	Presence and/or abundance of a variety of offshore upstanding reef biotopes (Table 1) at specified locations throughout the site, measured once during summer, within the reporting cycle.	Maintain the full variety of biotopes identified for the site to an established baseline, subject to natural change. *Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	This attribute aims to measure the overall variety of communities throughout the site. It will be expected to find the suite of target biotopes within the combined results of the survey for the site. Absence of a biotope from the subset will result in an unfavourable assessment for the feature. Measuring biotope composition throughout the whole site is challenging. It is therefore appropriate to measure the presence of the biotopes at a number of specified known locations throughout the site. Where changes in biotope composition are known to be attributable to natural processes (e.g. winter storm 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 and spatial pattern of offshore upstanding reef biotopes	Distribution and spatial arrangement of offshore upstanding reef biotopes (Table 1) at specified locations.	Maintain the distribution and spatial pattern of offshore upstanding reef biotopes identified for the site, to an	The distribution and spatial pattern of biotopes at specified locations is an essential component of the feature,

Attribute	Measure	Target	Comment
(Mandatory CSM attribute)	Measure during summer, once during reporting cycle.	established baseline, allowing for natural change. *Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	representing the structure and particularly the function of the reef. Distribution refers to the geographic location of biotopes throughout the feature. Spatial pattern refers to the local zonation or juxtaposition of biotopes at specified locations. This attribute complements an assessment of the 'biotope composition' attribute by ensuring that the distribution of the conservation interest is maintained throughout the feature. Unlike *Biotope Composition* this attribute is concerned with the presence or absence of biotopes at specific locations and their spatial relationship to one another. Measuring the full distribution and spatial pattern of the biotopes is challenging. It is therefore appropriate to measure the presence of the biotopes at a number of specified known locations throughout the site. Changes in the distribution and spatial arrangement may indicate long-term changes in the prevailing physical conditions at the site. Where changes in distribution/spatial pattern are known to be clearly attributable to cyclical

Attribute	Measure	Target	Comment
			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 representative / notable offshore upstanding reef biotopes (Discretionary CSM attribute)	Extent of offshore upstanding reef biotopes CR.HCR.XFa.ByErSp, CR.HCR.Xfa.CVirCri, CR.MCR.EcCr.CarSp.PenPcom, IR.HIR.KFaR.FoR, and IR.HIR.KFaR.LhypR.Pk, measured once during summer, within the reporting cycle.	No change in the extent of representative / notable offshore upstanding reef biotopes, from an established baseline, allowing for natural change. *Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	The extent of the representative/notable biotopes listed are an important structural aspect of the sub-feature and therefore the offshore upstanding reef habitat. Changes in extent and distribution may indicate long-term changes in the physical conditions at the site. Notable biotopes selected owing to their national significance, sensitivity, or representativity as a typical biotope for the biological zone. 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.
Presence of representative / notable offshore upstanding reef biotopes	Presence and/or abundance of offshore upstanding reef biotopes	Presence of biotopes at specified locations, should not deviate	Notable biotopes selected owing to their national significance, sensitivity,

Attribute	Measure	Target	Comment
(Discretionary CSM attribute)	CR.HCR.XFa.ByErSp, CR.HCR.Xfa.CVirCri, CR.MCR.EcCr.CarSp.PenPcom, IR.HIR.KFaR.FoR, and IR.HIR.KFaR.LhypR.Pk at specified locations. Measure during summer, once during reporting cycle.	significantly from an established baseline, allowing for natural change. *Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	or representativity as a typical biotope for the biological zone. For example, IR.HIR.KFaR.Lhyp.R.Pk is a representative biotope of the infralittoral and supports species rich communities, whilst both CR.HCR.XFa.ByErSp and CR.MCR.EcCr.CarSp.PenPcom are potentially sensitive to abrasion or changes in physical conditions. Where a biotope is lost from a baseline known area of presence (outside expected natural variation), leading to a loss of the conservation interest of the site, then condition should be considered unfavourable.
Species composition of representative or notable offshore upstanding reef biotopes (Discretionary CSM attribute)	Frequency and occurrence of component species of representative or notable offshore upstanding reef biotopes including: CR.HCR.XFa.ByErSp, CR.HCR.Xfa.CVirCri, CR.MCR.EcCr.CarSp.PenPcom, IR.HIR.KFaR.FoR, and IR.HIR.KFaR.LhypR.Pk, measured once, during summer, within the reporting cycle.	No decline in offshore upstanding reef biotope quality due to change in species composition or loss of notable species, from an established baseline, allowing for natural change. *Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	Notable biotopes selected owing to their national significance, sensitivity, and representativity as a typical biotope for the biological zone. Species composition is an important contributor to the structure of a biotope and therefore the reef as a whole. The presence and abundance of a characterising species gives an indication of the quality of a biotope, and any change in composition may indicate a cyclic change or trend in the reef community. Where changes in species composition are known to be

Attribute	Measure	Target	Comment
			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.
Presence and/or abundance of specified offshore upstanding reef species (Discretionary CSM attribute)	Offshore upstanding reef species may include: *Alcyonium digitatum, Caryophyllia smithii, Cliona celata, Corynactis viridis Laminaria hyperborea,* and *Urticina felina;* and should include*; Eunicella verrucosa* and *Pentapora fascialis.* Measure once, in summer, during the reporting cycle.	Maintain presence and/or abundance of species from an established baseline, allowing for natural change. *Species identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	Changes in presence and/or abundance of a species can critically affect the physical and functional nature of the habitat, leading to unfavourable condition. The species selected should serve an important role in the structure and function of the biological community. Where the field assessment judges changes in the presence and/or abundance of specified species to be unfavourable, and subsequent investigation reveals the cause is clearly attributable to natural succession and known cyclical change (such as mass recruitment and dieback of characterising species), the final assessment will require expert judgement to determine the reported condition of the feature. The feature's condition

Attribute	Measure	Target	Comment
			could be declared favourable where the expert judgement by Natural England officers is certain that the conservation interest of the feature is not compromised by the failure of this attribute to meet its target condition. Where there is a change outside the expected variation or a loss of the conservation interest of the site, (e.g. due to anthropogenic activities or unrecoverable natural losses) then condition should be considered unfavourable.

Feature: Reefs
Sub-feature: Coastal Upstanding Reefs

Attribute	Measure	Target	Comment
Extent of coastal upstanding reefs (Mandatory CSM attribute)	Overall area (ha) of coastal upstanding reefs measured periodically throughout the reporting cycle.	No decrease in extent from established baseline, subject to natural change. *Baseline established by Birchenough et al. (2008) and supplemented by Axelsson & Dewey (2011).*	Extent of reef is a reporting requirement of the Habitats Directive. While changes in extent may be unlikely due to 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. The chart in appendix B shows the mapped extent of the sub-feature.
Biotope composition of coastal upstanding reefs (Mandatory CSM attribute)	Presence and/or abundance of a variety of coastal upstanding reef biotopes (Table 2) at specified locations throughout the site,	Maintain the full variety of biotopes identified for the site to an established baseline, subject to natural change.	This attribute aims to measure the overall variety of communities throughout the site. It will be expected to find the suite of target

Attribute	Measure	Target	Comment
	measured once during summer, within the reporting cycle.	*Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	biotopes within the combined results of the survey for the site. Absence of a biotope from the subset will result in an unfavourable assessment for the feature. Measuring biotope composition throughout the whole site is challenging. It is therefore appropriate to measure the presence of the biotopes at a number of specified known locations throughout the site. Where changes in biotope composition are known to be attributable to natural processes (e.g. winter storm 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 and spatial pattern of coastal upstanding reef biotopes (Mandatory CSM attribute)	Distribution and spatial arrangement of coastal upstanding reef biotopes (Table 2) at specified locations. Measure during summer, once during reporting cycle.	Maintain the distribution and spatial pattern of coastal upstanding reef biotopes identified for the site, to an established baseline, allowing for natural change. *Biotopes identified by Birchenough et*	The distribution and spatial pattern of biotopes at specified locations is an essential component of the feature, representing the structure and particularly the function of the reef. Distribution refers to the geographic location of biotopes throughout the

Attribute	Measure	Target	Comment
		al. (2008) and Axelsson & Dewey (2011).	feature. Spatial pattern refers to the local zonation or juxtaposition of biotopes at specified locations. This attribute complements an assessment of the 'biotope composition' attribute by ensuring that the distribution of the conservation interest is maintained throughout the feature. Unlike *Biotope Composition* this attribute is concerned with the presence or absence of biotopes at specific locations and their spatial relationship to one another. Measuring the full distribution and spatial pattern of the biotopes is challenging. It is therefore appropriate to measure the presence of the biotopes at a number of specified known locations throughout the site. Changes in the distribution and spatial arrangement may indicate long-term changes in the prevailing physical conditions at the site. 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

Attribute	Measure	Target	Comment
			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 representative / notable coastal upstanding reef biotopes (Discretionary CSM attribute)	Extent of coastal upstanding reef biotopes CR.HCR.XFa.ByErSp.Eun, IR.HIR.KFaR.FoR.Dic, IR.HIR.KFaR.LhypR.Ft, IR.HIR.KFaR.LhypR.Pk, and IR.HIR.Ksed.LsacSac, measured once during summer, within the reporting cycle.	No change in the extent of representative/notable coastal upstanding reef biotopes, from an established baseline, allowing for natural change. *Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	The extent of the representative/notable biotopes listed are an important structural aspect of the sub-feature and therefore the coastal upstanding reef habitat. Changes in extent and distribution may indicate long-term changes in the physical conditions at the site. Notable biotopes selected owing to their national significance, sensitivity, or representativity as a typical biotope for the biological zone. 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.
Presence of representative / notable coastal upstanding reef biotopes (Discretionary CSM attribute)	Presence and/or abundance of coastal upstanding reef biotopes CR.HCR.XFa.ByErSp.Eun, IR.HIR.KFaR.FoR.Dic, IR.HIR.KFaR.LhypR.Ft, IR.HIR.KFaR.LhypR.Pk, and	Presence of biotopes at specified locations, should not deviate significantly from an established baseline, allowing for natural change. *Biotopes identified by Birchenough et*	Notable biotopes selected owing to their national significance, sensitivity, or representativity as a typical biotope for the biological zone. For example,IR.HIR.KFaR.LhypR.Ft and IR.HIR.KFaR.Lhyp.R.Pk are

Attribute	Measure	Target	Comment
	IR.HIR.Ksed.LsacSac at specified locations. Measure during summer, once during reporting cycle.	*al. (2008) and Axelsson & Dewey (2011).*	representative biotopes of the infralittoral and supports species rich communities, whilst CR.HCR.XFa.ByErSp.Eun is nationally significant and potentially sensitive to abrasion or changes in physical conditions. Where a biotope is lost from a baseline known area of presence (outside expected natural variation), leading to a loss of the conservation interest of the site, then condition should be considered unfavourable.
Species composition of representative or notable coastal upstanding reef biotopes (Discretionary CSM attribute)	Frequency and occurrence of component species of representative or notable coastal upstanding reef biotopes including: CR.HCR.XFa.ByErSp.Eun, IR.HIR.KFaR.FoR.Dic, IR.HIR.KFaR.LhypR.Ft, IR.HIR.KFaR.LhypR.Pk, and IR.HIR.Ksed.LsacSac, measured once, during summer, within the reporting cycle.	No decline in coastal upstanding reef biotope quality due to change in species composition or loss of notable species, from an established baseline, allowing for natural change. *Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	Notable biotopes selected owing to their national significance, sensitivity, and representativity as a typical biotope for the biological zone. Species composition is an important contributor to the structure of a biotope and therefore the reef as a whole. The presence and abundance of a characterising species gives an indication of the quality of a biotope, and any change in composition may indicate a cyclic change or trend in the reef community. Where changes in species composition are known to be clearly attributable to natural succession, known cyclical change or mass recruitment or dieback of

Attribute	Measure	Target	Comment
			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.
Presence and/or abundance of specified coastal upstanding reef species (Discretionary CSM attribute)	Coastal upstanding reef species may include: *Alcyonium digitatum, Antedon bifida, Cliona celata, Corynactis viridis, Dilsea carnosa, Flustra foliacea Laminaria hyperborea, Laminaria saccharina,* and *Saccorhiza polyschides;* and should include*; Eunicella verrucosa, Pentapora fascialis,* and *Stolonica socialis.* Measure once, in summer, during the reporting cycle.	Maintain presence and/or abundance of species from an established baseline, allowing for natural change. *Species identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	Changes in presence and/or abundance of a species can critically affect the physical and functional nature of the habitat, leading to unfavourable condition. The species selected should serve an important role in the structure and function of the biological community. Where the field assessment judges changes in the presence and/or abundance of specified species to be unfavourable, and subsequent investigation reveals the cause is clearly attributable to natural succession and known cyclical change (such as mass recruitment and dieback of characterising species), the final assessment will require expert judgement to determine the reported condition of the feature. The feature's condition could be declared favourable where the expert judgement by Natural England officers is certain that the

Attribute	Measure	Target	Comment
			conservation interest of the feature is not compromised by the failure of this attribute to meet its target condition. Where there is a change outside the expected variation or a loss of the conservation interest of the site, (e.g. due to anthropogenic activities or unrecoverable natural losses) then condition should be considered unfavourable.

Feature: Reefs
Sub-feature: Flat Bedrock Reefs

Attribute	Measure	Target	Comment
Extent of flat bedrock reefs (Mandatory CSM attribute)	Overall area (ha) of flat bedrock reefs measured periodically throughout the reporting cycle.	No decrease in extent from established baseline, subject to natural change. *Baseline established by Birchenough et al. (2008) and supplemented by Axelsson & Dewey (2011).*	Extent of reef is a reporting requirement of the Habitats Directive. While changes in extent may be unlikely due to 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. The chart in appendix B shows the mapped extent of the sub-feature.
Biotope composition of flat bedrock reefs (Mandatory CSM attribute)	Presence and/or abundance of a variety of flat bedrock reef biotopes (Table 3) at specified locations throughout the site, measured once during summer, within the reporting cycle.	Maintain the full variety of biotopes identified for the site to an established baseline, subject to natural change. *Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey*	This attribute aims to measure the overall variety of communities throughout the site. It will be expected to find the suite of target biotopes within the combined results of the survey for the site. Absence of a biotope from the subset will result

Attribute	Measure	Target	Comment
		(2011).	in an unfavourable assessment for the feature. Measuring biotope composition throughout the whole site is challenging. It is therefore appropriate to measure the presence of the biotopes at a number of specified known locations throughout the site. Where changes in biotope composition are known to be attributable to natural processes (e.g. winter storm 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 and spatial pattern of flat bedrock reef biotopes (Mandatory CSM attribute)	Distribution and spatial arrangement of flat bedrock reef biotopes (Table 3) at specified locations. Measure during summer, once during reporting cycle.	Maintain the distribution and spatial pattern of flat bedrock reef biotopes identified for the site, to an established baseline, allowing for natural change. *Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	The distribution and spatial pattern of biotopes at specified locations is an essential component of the feature, representing the structure and particularly the function of the reef. Distribution refers to the geographic location of biotopes throughout the feature. Spatial pattern refers to the local zonation or juxtaposition of biotopes at specified locations.

Attribute	Measure	Target	Comment
			This attribute complements an assessment of the 'biotope composition' attribute by ensuring that the distribution of the conservation interest is maintained throughout the feature. Unlike *Biotope Composition* this attribute is concerned with the presence or absence of biotopes at specific locations and their spatial relationship to one another. Measuring the full distribution and spatial pattern of the biotopes is challenging. It is therefore appropriate to measure the presence of the biotopes at a number of specified known locations throughout the site. Changes in the distribution and spatial arrangement may indicate long-term changes in the prevailing physical conditions at the site. 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

Attribute	Measure	Target	Comment
			the site is identified, then condition should be considered unfavourable.
Extent of representative / notable flat bedrock reef biotopes (Discretionary CSM attribute)	Extent of flat bedrock reef biotopes CR.HCR.XFa.ByErSp.Eun, CR.HCR.Xfa.CVirCri, CR.MCR.EcCr.FaAlCr.Flu, IR.HIR.KFaR.FoR.Dic, and IR.HIR.KFaR.LhypR.Ft, measured once during summer, within the reporting cycle.	No change in the extent of representative/notable flat bedrock reef biotopes, from an established baseline, allowing for natural change. *Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	The extent of the representative/notable biotopes listed are an important structural aspect of the sub-feature and therefore the flat bedrock reef habitat. Changes in extent and distribution may indicate long-term changes in the physical conditions at the site. Notable biotopes selected owing to their national significance, sensitivity, or representativity as a typical biotope for the biological zone. 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.
Presence of representative / notable flat bedrock reef biotopes (Discretionary CSM attribute)	Presence and/or abundance of flat bedrock reef biotopes CR.HCR.XFa.ByErSp.Eun, CR.HCR.Xfa.CVirCri, CR.MCR.EcCr.FaAlCr.Flu, IR.HIR.KFaR.FoR.Dic, and IR.HIR.KFaR.LhypR.Ft at specified locations. Measure during summer, once during reporting cycle.	Presence of biotopes at specified locations, should not deviate significantly from an established baseline, allowing for natural change. *Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	Notable biotopes selected owing to their national significance, sensitivity, or representativity as a typical biotope for the biological zone. For example,IR.HIR.KFaR.LhypR.Ft is a representative biotopes of the infralittoral and supports species rich communities, whilst CR.HCR.XFa.ByErSp.Eun is

Attribute	Measure	Target	Comment
			nationally significant and potentially sensitive to abrasion or changes in physical conditions. Where a biotope is lost from a baseline known area of presence (outside expected natural variation), leading to a loss of the conservation interest of the site, then condition should be considered unfavourable.
Species composition of representative or flat bedrock reef biotopes (Discretionary CSM attribute)	Frequency and occurrence of component species of representative or notable flat bedrock reef biotopes including: CR.HCR.XFa.ByErSp.Eun, CR.HCR.Xfa.CVirCri, CR.MCR.EcCr.FaAlCr.Flu, IR.HIR.KFaR.FoR.Dic, and IR.HIR.KFaR.LhypR.Ft, measured once, during summer, within the reporting cycle.	No decline in offshore flat bedrock reef quality due to change in species composition or loss of notable species, from an established baseline, allowing for natural change. *Biotopes identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	Notable biotopes selected owing to their national significance, sensitivity, and representativity as a typical biotope for the biological zone. Species composition is an important contributor to the structure of a biotope and therefore the reef as a whole. The presence and abundance of a characterising species gives an indication of the quality of a biotope, and any change in composition may indicate a cyclic change or trend in the reef community. 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

Attribute	Measure	Target	Comment
			expected variation or a loss of the conservation interest of the site, then condition should be considered unfavourable.
Presence and/or abundance of specified flat bedrock reef species (Discretionary CSM attribute)	Coastal upstanding reef species may include: *Alcyonium digitatum, Antedon bifida, Caryophyllia smithii,* and *Corynactis viridis;* and should include*; Alcyonium glomeratum, Eunicella verrucosa, Pentapora fascialis,* and *Stolonica socialis.* Measure once, in summer, during the reporting cycle.	Maintain presence and/or abundance of species from an established baseline, allowing for natural change. *Species identified by Birchenough et al. (2008) and Axelsson & Dewey (2011).*	Changes in presence and/or abundance of a species can critically affect the physical and functional nature of the habitat, leading to unfavourable condition. The species selected should serve an important role in the structure and function of the biological community. Where the field assessment judges changes in the presence and/or abundance of specified species to be unfavourable, and subsequent investigation reveals the cause is clearly attributable to natural succession and known cyclical change (such as mass recruitment and dieback of characterising species), the final assessment will require expert judgement to determine the reported condition of the feature. The feature's condition could be declared favourable where the expert judgement by Natural England officers is certain that the conservation interest of the feature is not compromised by the failure of this attribute to meet its target condition. Where there is a change outside the

Attribute	Measure	Target	Comment
			expected variation or a loss of the conservation interest of the site, (e.g. due to anthropogenic activities or unrecoverable natural losses) then condition should be considered unfavourable.

Table 1

Lizard Point cSAC Offshore Upstanding Reef Communities

Offshore Upstanding Reef Communities **Source: Birchenough et al. (2008); Axelsson & Dewey (2011)**	
Key Biotopes	**Definition**
CR.HCR.Xfa.ByErSp	Bryozoan turf and erect sponges on tideswept circalittoral rock.
CR.HCR.Xfa.CVirCri	*Corynactis viridis* and a mixed turf of crisiids, *Bugula, Scrupocellaria*, and *Cellaria* on moderately tide-swept exposed circalittoral rock
CR.HCR.Xfa.SpNemAdia	Sparse sponges, *Nemertesia spp*., and *Alcyonidium diaphanum* on circalittoral mixed substrata
CR.MCR.EcCr.CarSp.PenPcom	*Caryophyllia smithii* and sponges *with Pentapora fascialis, Porella compressa* and crustose communities on wave-exposed circalittoral rock
CR.MCR.EcCr.UrtScr	*Urticina felina* and sand-tolerant fauna on sand-scoured or covered circalittoral rock.
IR.HIR.KFaR.FoR	Foliose red seaweeds on exposed lower infralittoral rock
IR.HIR.KFaR.LhypR.Pk	*Laminaria hyperborea* park with dense foliose red seaweeds on exposed lower infralittoral rock
Key Species	**Common name**
Alcyonidium diaphanum	Sea chervil
Alcyonium digitatum	Dead man's fingers
Bugula plumosa	a bryozoan
Cancer pagurus	Edible crab
Caryophyllia smithii	Devonshire cup coral
Cellaria spp.	a bryozoan
Cliona celata	Boring sponge
Corynactis viridis	Jewel anemone
Crisiidae sp.	a bryozoan
Delesseria sanguinea	Sea beech
Desmarestia sp.	Sea sorrel
Dictyopteris membranacea	a brown seaweed
Dictyota dichotoma	a brown seaweed
Drachiella spectabilis	a red seaweed
Echinus esculentus	Edible sea urchin
Holothuria forskali	Cotton spinner sea cucumber
Laminaria hyperborea	Tangle or cuvie
Luidia ciliaris	Seven-armed starfish
Marthasterias glacialis	Spiny starfish
Nemertesia antennina	Sea beard
Pentapora fascialis	Ross
Polymastia spp.	a sponge
Porella compressa	A bryozoan
Tubularia indivisa	Oaten pipes hydroid
Urticina felina	Dahlia anemone

Listed species and biotopes may be reviewed to reflect new evidence / survey results.

Table 2

Lizard Point cSAC Coastal Upstanding Reef Communities

Coastal Upstanding Reef Communities **Source: Birchenough et al. (2008); Axelsson & Dewey (2011)**	
Key Biotopes	**Definition**
CR.HCR.Xfa	Mixed faunal turf communities on bedrock and boulders
CR.HCR.Xfa.ByErSp	Bryozoan turf and erect sponges on tideswept circalittoral rock.
CR.HCR.Xfa.ByErSp.Eun	*Eunicella verrucosa and Pentapora fascialis on wave-exposed circalittoral rock*
CR.MCR.EcCr	Echinoderm (Aslia) and crustose community
IR.HIR.KFaR.FoR	Foliose red seaweeds on exposed lower infralittoral rock
IR.HIR.KFaR.FoR.Dic	Foliose red seaweeds with dense *Dictyota dichotoma* and/or *Dictyopteris membranacea* on exposed lower infralittoral rock
IR.HIR.KFaR.LhypR.Ft	*Laminaria hyperborea* forest with dense foliose red seaweeds on exposed upper infralittoral rock.
IR.HIR.KFaR.LhypR.Pk	*Laminaria hyperborea* park with dense foliose red seaweeds on exposed lower infralittoral rock
IR.HIR.Ksed	Kelp and red seaweeds on sediment covered rock
IR.HIR.Ksed.Sac	*Saccorhiza polyschides* and other opportunistic kelps on disturbed sublittoral fringe rock
IR.HIR.Ksed.LsacSac	*Laminaria saccharina* and/or *Saccorhiza polyschides* on exposed infralittoral rock
IR.HIR.Ksed.XKHal	*Halidrys* and mixed kelps on tide-swept rock and coarse sediment
IR.HIR.Ksed.XKScrR	Mixed kelps with scour-tolerant and opportunistic foliose red seaweeds on scoured or sand-covered infralittoral rock
IR.MIR.KR.Lhyp	*Laminaria hyperborea* on tide-swept, infralittoral rock
Key Species	**Common name**
Alcyonidium diaphanum	Sea chervil
Alcyonium digitatum	Dead man's fingers
Antedon bifida	Rosy feather-star
Calliblepharis ciliata	Eyelash weed
Cellaria spp.	a bryozoan
Cliona celata	Boring sponge
Corynactis viridis	Jewel anemone
Crisiidae sp.	a bryozoan
Delesseria sanguinea	Sea beech
Desmarestia sp.	Sea sorrel
Dictyopteris membranacea	a brown seaweed
Dictyota dichotoma	a brown seaweed
Dilsea carnosa	Red rags
Drachiella spectabilis	a red seaweed
Echinus esculentus	Edible sea urchin
Eunicella verrucosa	Pink sea fan
Flustra foliacea	Hornwrack
Henricia sp.	Bloody Henry star fish
Heterosiphonia plumosa	a red seaweed
Laminaria hyperborea	Tangle or cuvie

Laminaria saccharina	Sugar kelp
Marthasterias glacialis	Spiny starfish
Membranipora membranacea	Sea mat
Nemertesia spp.	a cnidarian
Pentapora fascialis	Ross
Saccorhiza polyschides	Furbellows
Stolonica socialis	Orange sea grapes
Tubularia indivisa	Oaten pipes hydroid

Listed species and biotopes may be reviewed to reflect new evidence / survey results.

Table 3

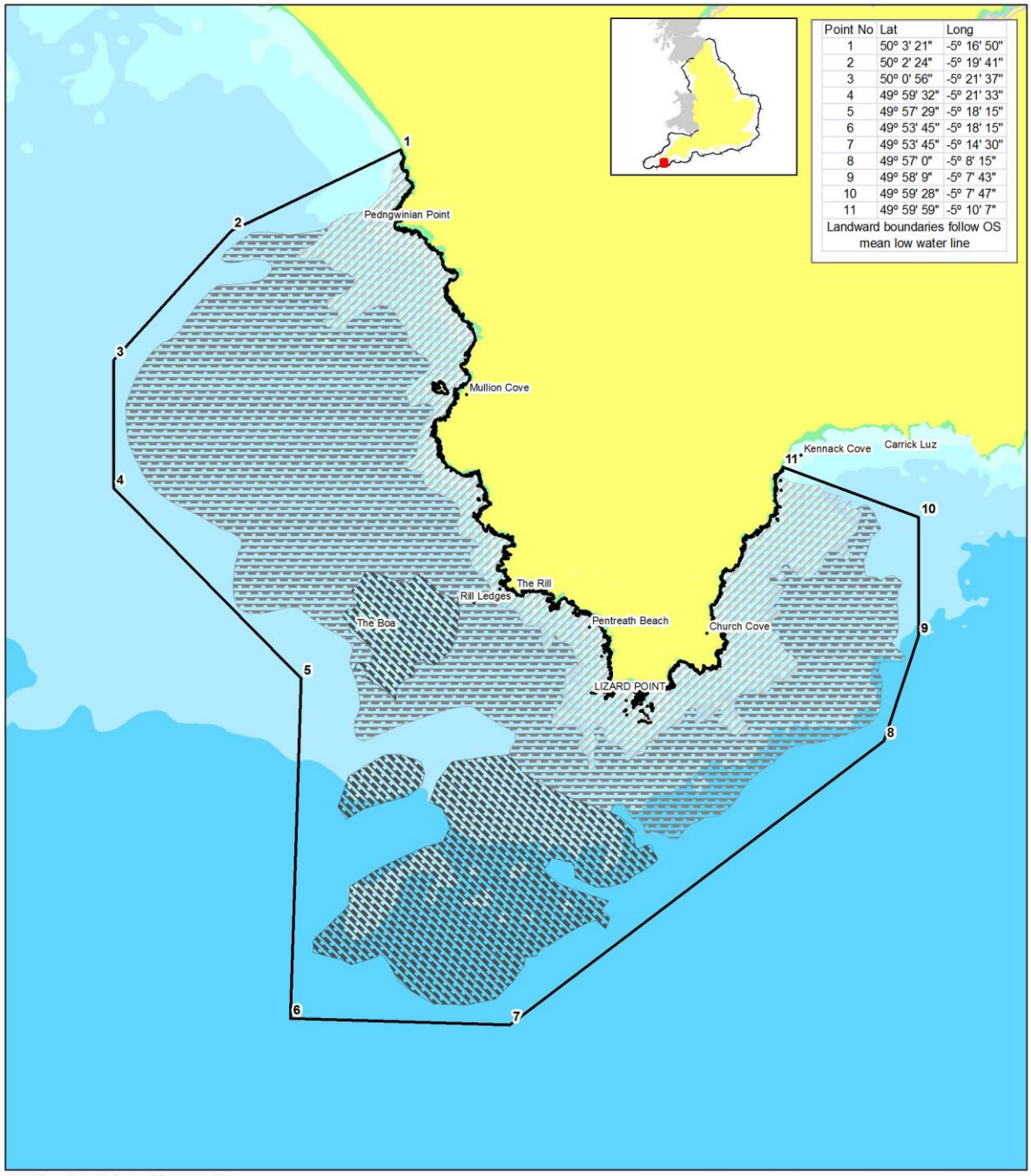
Lizard Point cSAC Flat Bedrock Reef Communities

Flat Bedrock Reef Communities Source: Birchenough et al. (2008); Axelsson & Dewey (2011)	
Key Biotopes	**Definition**
CR.HCR.Xfa	Mixed faunal turf communities on bedrock and boulders
CR.HCR.Xfa.ByErSp	Bryozoan turf and erect sponges on tideswept circalittoral rock.
CR.HCR.Xfa.ByErSp.Eun	*Eunicella verrucosa and Pentapora fascialis on wave-exposed circalittoral rock*
CR.HCR.Xfa.CVirCri	*Corynactis viridis* and a mixed turf of crisiids, *Bugula, Scrupocellaria*, and *Cellaria* on moderately tide-swept exposed circalittoral rock
CR.HCR.XFa.SpAnVt	Sponges and anemones on vertical circalittoral bedrock
CR.HCR.Xfa.SpNemAdia	Sparse sponges, *Nemertesia spp*., and *Alcyonidium diaphanum* on circalittoral mixed substrata
CR.MCR.EcCr	Echinoderm (Aslia) and crustose community
CR.MCR.EcCr.CarSp	*Caryophyllia smithii,* sponges and crustose communities on wave-exposed circalittoral rock.
CR.MCR.EcCr.FaAlCr.Flu	Flustra and animal crusts on scoured rock
CR.MCR.EcCr.UrtScr	*Urticina felina* and sand-tolerant fauna on sand-scoured or covered circalittoral rock.
IR.HIR.KFaR.FoR	Foliose red seaweeds on exposed lower infralittoral rock
IR.HIR.KFaR.FoR.Dic	Foliose red seaweeds with dense *Dictyota dichotoma* and/or *Dictyopteris membranacea* on exposed lower infralittoral rock
IR.HIR.KFaR.LhypR.Ft	*Laminaria hyperborea* forest with dense foliose red seaweeds on exposed upper infralittoral rock.
Key Species	**Common name**
Actinothoe sphyrodeta	Sandalled anemone
Alcyonidium diaphanum	Sea chervil
Alcyonium digitatum	Dead man's fingers
Alcyonium glomeratum	Red sea fingers
Antedon bifida	Rosy feather-star
Aslia lefevrei	Brown sea cucumber
Asterias rubens	Common starfish
Axinella polypoides	a branching sponge
Bugula sp.	a bryozoan
Caryophyllia smithii	Devonshire cup coral
Cellaria spp.	a bryozoan
Corynactis viridis	Jewel anemone
Dictyopteris membranacea	a brown seaweed
Dictyota dichotoma	a brown seaweed
Echinus esculentus	Edible sea urchin
Eunicella verrucosa	Pink sea fan
Holothuria forskali	Cotton spinner sea cucumber
Laminaria hyperborea	Tangle or cuvie
Luidia ciliaris	Seven-armed starfish
Marthasterias glacialis	Spiny starfish
Microciona spp.	a sponge

Nemertesia antennina	Sea beard
Ophiocomina nigra	Black brittlestar
Pentapora fascialis	Ross
Polymastia spp.	a sponge
Stolonica socialis	Orange sea grapes
Urticina felina	Dahlia anemone

Listed species and biotopes may be reviewed to reflect new evidence / survey results.

Appendix B Map showing the interest features of Lizard Point cSAC



Appendix C

Appendix C Methods for deriving vulnerability[17].

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. For the reef sub-features the sensitivity is as defined by MarLIN (2011). The sensitivity assessment for each activity in Appendix D for the sub-feature uses the highest (i.e. most precautionary) sensitivity for the range of biotopes and species used to define this sub-feature, where more than one biotope or species is related to a sub-feature (see Appendix F for list of biotopes and species sub-features consist of, and for which sensitivity assessments are available for).

		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

[17] Where sensitivities in MarLIN are defined as 'Very Low' they are classified here as 'Low'. Where sensitivities in MarLIN are defined as 'Very High' they are classified here as 'High'.

Appendix D Summary of pressures which may cause deterioration or disturbance to Lizard Point cSAC

Pressures which may cause deterioration or disturbance	Offshore Upstanding Reef	Coastal Upstanding Reef	Flat Bedrock Reef
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)	✓	✓	✓
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)			
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)	✓	✓	✓

(✓) represents where there is currently insufficient information to either determine the sensitivity of the habitat and/or the exposure of the habitat to the stated operation.

Appendix E Assessment of the relative vulnerability of interest features and sub-features of the Lizard Point cSAC to different categories of pressures (see Appendix C for key).

Pressures which may cause deterioration or disturbance	**Annex 1 Reefs**								
	Offshore Upstanding Reef			**Coastal Upstanding Reef**			**Flat Bedrock Reef**		
	Sensitivity	**Exposure**	**Vulnerability**	**Sensitivity**	**Exposure**	**Vulnerability**	**Sensitivity**	**Exposure**	**Vulnerability**
Physical loss									
Removal[18] (e.g. capital dredging, offshore development)	••	-	-	•••	-	-	•••	-	-
Smothering (e.g. by aggregate dredging, disposal of dredge spoil)	••	-	-	••	+	Low	••	-	-
Physical damage									
Siltation (e.g. run off, channel dredging, outfalls)	•	+	Low	•	+	Low	•	+	Low
Abrasion (e.g. boating, anchoring, demersal fishing)	••	++	Moderate	•••	++	High	•••	++	High
Selective extraction[19] (e.g. aggregate dredging)	••	++	Moderate	•••	++	High	•••	++	High
Non-physical disturbance									
Noise (e.g. boat activity)	-	-	-	-	-	-	-	-	-
Visual (e.g. recreational activity)	-	-	-	-	-	-	-	-	-

[18] This is equivalent to 'Substratum loss' in MarLIN sensitivity analysis
[19] This is equivalent to 'Displacement' in MarLIN sensitivity analysis

Pressures which may cause deterioration or disturbance	Annex 1 Reefs								
	Offshore Upstanding Reef			Coastal Upstanding Reef			Flat Bedrock Reef		
	Sensitivity	Exposure	Vulnerability	Sensitivity	Exposure	Vulnerability	Sensitivity	Exposure	Vulnerability
Toxic contamination									
Introduction of synthetic compounds (e.g. pesticides, TBT, PCBs)	••	++	Moderate	••	++	Moderate	••	++	Moderate
Introduction of non-synthetic compounds (e.g. heavy metals, hydrocarbons)	••	++	Moderate	••	++	Moderate	••	++	Moderate
Introduction of radionuclides	Insufficient information	-	-	Insufficient information	-	-	Insufficient information	-	-
Non-toxic contamination									
Changes in nutrient loading (e.g. agricultural run-off, outfalls)	••	-	-	••	++	Moderate	••	-	-
Changes in organic loading (e.g. mariculture, outfalls)	••	-	-	•••	+	Moderate	•••	-	-
Changes in thermal regime (e.g. power stations)	••	-	-	••	-	-	••	-	-
Changes in turbidity (e.g. run-off, dredging)	••	-	-	••	+	Low	••	-	-
Changes in salinity (e.g. water abstraction, outfalls)	••	-	-	•••	+	Moderate	•••	-	-
Biological disturbance									
Introduction of microbial pathogens	•	+	Low	•	+	Low	•	+	Low
Introduction of non-native species and translocation	Insufficient information	++	Insufficient information	••	++	Moderate	Insufficient information	++	Insufficient information

Pressures which may cause deterioration or disturbance	Annex 1 Reefs								
	Offshore Upstanding Reef			Coastal Upstanding Reef			Flat Bedrock Reef		
	Sensitivity	Exposure	Vulnerability	Sensitivity	Exposure	Vulnerability	Sensitivity	Exposure	Vulnerability
Selective extraction of species (e.g. bait digging, wildfowling, commercial & recreational fishing)	••	++	Moderate	•••	++	High	•••	++	High

Appendix F Lizard Point cSAC Species and Biotopes used to determine site sensitivity

Lizard Point cSAC Species and Biotopes[20] used to determine site sensitivity	
Coastal Upstanding Reefs	
CR.HCR.Xfa.ByErSp.Eun	*Eunicella verrucosa* and *Pentapora fascialis* on wave-exposed circalittoral rock
IR.HIR.KFaR.FoR	Foliose red seaweeds on exposed lower infralittoral rock
Alcyonium digitatum	Dead man's fingers
Antedon bifida	Rosy feather-star
Delesseria sanguinea	Sea beech
Echinus esculentus	Edible sea urchin
Flustra foliacea	Hornwrack
Laminaria hyperborea	Tangle or cuvie
Pentapora fascialis	Ross
Saccorhiza polyschides	Furbellows
Flat Bedrock Reefs	
CR.HCR.Xfa.ByErSp.Eun	*Eunicella verrucosa* and *Pentapora fascialis* on wave-exposed circalittoral rock
IR.HIR.KFaR.FoR	Red seaweeds on rock with *Alcyonium digitatum*
Alcyonium digitatum	Dead man's fingers
Antedon bifida	Rosy feather-star
Asterias rubens	Common starfish
Echinus esculentus	Edible sea urchin
Eunicella verrucosa	Pink sea fan
Pentapora fascialis	Ross
Offshore Upstanding Reefs	
IR.HIR.KFaR.FoR	Foliose red seaweeds on exposed lower infralittoral rock
Alcyonium digitatum	Dead man's fingers
Delesseria sanguine	Sea beech
Echinus esculentus	Edible sea urchin
Eunicella verrucosa	Pink sea fan
Laminaria hyperborea	Tangle or cuvie
Pentapora fascialis	Ross
Urticina felina	Dahlia anemone

[20] Biotopes used are according to MarLIN 2004 codes (see www.marlin.ac.uk). These listed biotopes and species may be reviewed to reflect new evidence/survey results.