

Purbeck Coast Proposed Marine Conservation Zone



The **Purbeck Coast** (incorporating intertidal features between Broad Bench and Kimmeridge Bay) has been proposed as a Marine Conservation Zone (pMCZ) as part of Tranche 3 of the designation round. The sites and features to be selected were determined by a gap analysis of the Marine Protected Area (MPA) network and included new sites as well as mobile species. Natural England presented the proposals for this pMCZ to local stakeholder groups in March 2017. The Joint Nature Conservation Committee (JNCC) had reviewed the coverage of existing MPAs in Secretary of State waters in 2016. Defra indicated the MPA network in Secretary of State waters should achieve the targets set out in the Ecological Network Guidance (Natural England & JNCC, 2010). This review revealed a shortfall in the protection of subtidal mixed sediments in the Eastern Channel region (Carr et al, 2016). The data presented in this report indicate the presence of extensive areas of both subtidal mixed and coarse sediment within the Purbeck Coast pMCZ. There are also diverse infralittoral and circalittoral rocky reef communities already designated under the Studland to Portland Site of Community Interest (SCI). The boundaries of the Purbeck Coast pMCZ coincide with those for the Studland to Portland SCI.

The proposed subtidal designation features for the pMCZ are:

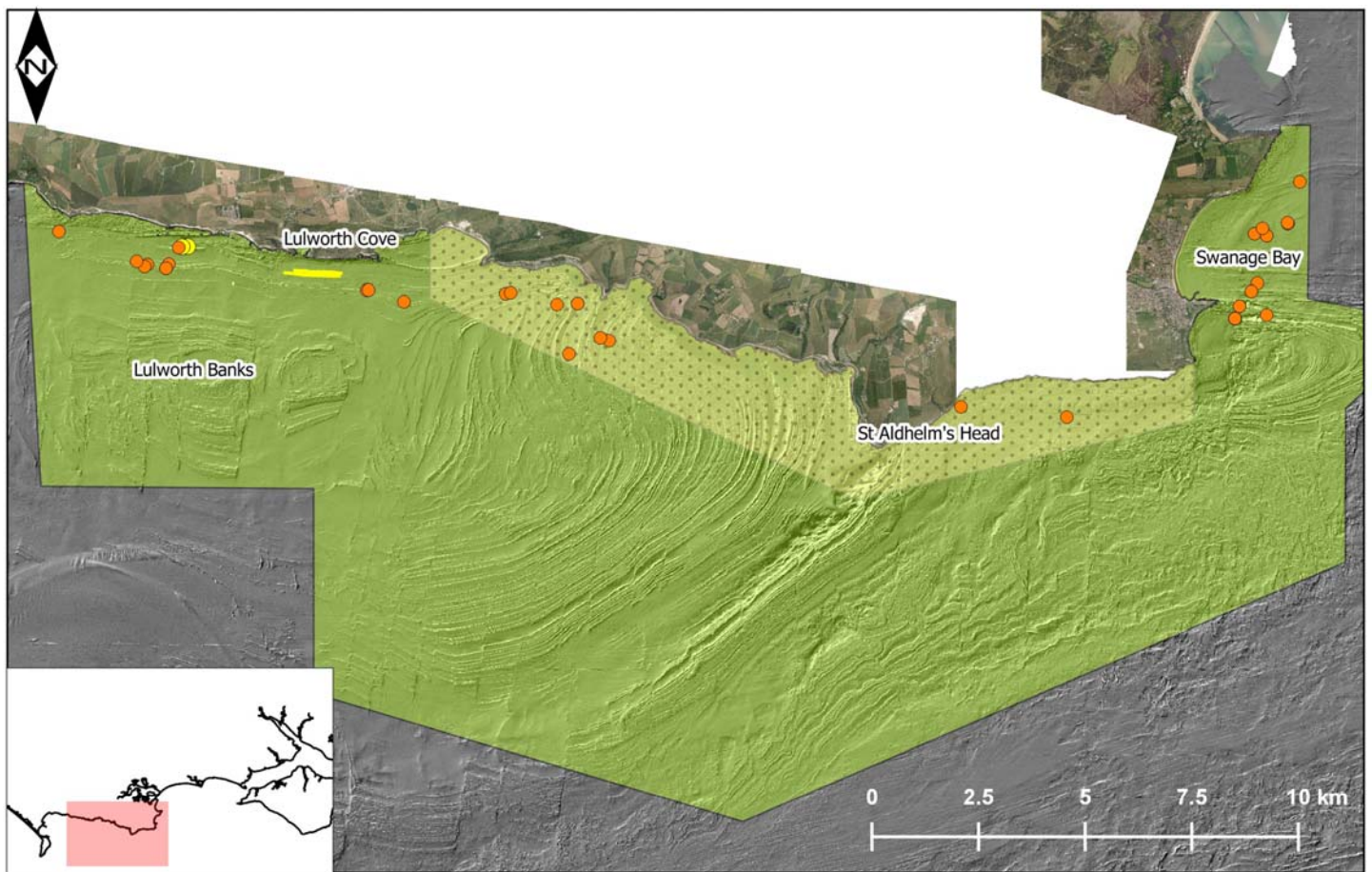
- Subtidal coarse sediment
- Subtidal mixed sediments
- Maerl beds.

Survey work within the Purbeck Coast pMCZ has indicated that such sediments including some with relatively high concentrations of maerl are widely distributed within the area. A second pMCZ called Purbeck Coast (Mobile Species) has been proposed for part of the same area. It would seem logical to include the mobile species of interest, namely Black Bream (*Spondyliosoma cantharus*) as a designated feature of the wider Purbeck Coast pMCZ. The extents of these two pMCZs are shown in Figure 1. Dive locations are shown in Fig. 2.

The proposed designated sediment features cover all sublittoral sediment biotopes other than sand and mud communities. Coarse sediments comprise unstable cobbles, pebbles, gravels and coarse sands with less than 10% mud content. Mixed sediments are harder to classify and are described as follows (JNCC, 2017):



“Sublittoral mixed (heterogeneous) sediments found from the extreme low water mark to deep offshore circalittoral habitats. These habitats incorporate a range of sediments including heterogeneous muddy gravelly sands and also mosaics of cobbles and pebbles embedded in or lying upon sand, gravel or mud. There is a degree of confusion with regard nomenclature within this complex as many habitats could be defined as containing mixed sediments, in part depending on the scale of the survey and the sampling method employed. The British Geological Survey (BGS) trigon can be used to define truly mixed or heterogeneous sites with surficial sediments which are a mixture of mud, gravel and sand. However, another ‘form’ of mixed sediment includes mosaic habitats such as superficial waves or ribbons of sand on a gravel bed or areas of lag deposits with cobbles/pebbles embedded in sand or mud and these are less well defined and may overlap into other habitat or biotope complexes. These habitats may support a wide range of infauna and epibiota including polychaetes, bivalves, echinoderms, anemones, hydroids and Bryozoa.” The modified Folk Trigon defines “mixed sediments” as those including a proportion of mud ranging from 10%–90% of the content.



Legend

- Purbeck Coast rMCZ
- Purbeck Coast (Mobile Species) rMCZ
- 2017 Durdle Door Maerl
- 2017 Fossil Forest Drifts
- Dorset Seasearch Maerl Records

Aerial imagery courtesy of the Channel Coastal Observatory provided under the Open Government Licence © New Forest District Council. Contains OS data © Crown copyright and database right (2016). Produced data from DORIS (DORset Integrated Seabed survey). Not to be used for navigation

Figure 1
Overview of the Purbeck Coast pMCZ

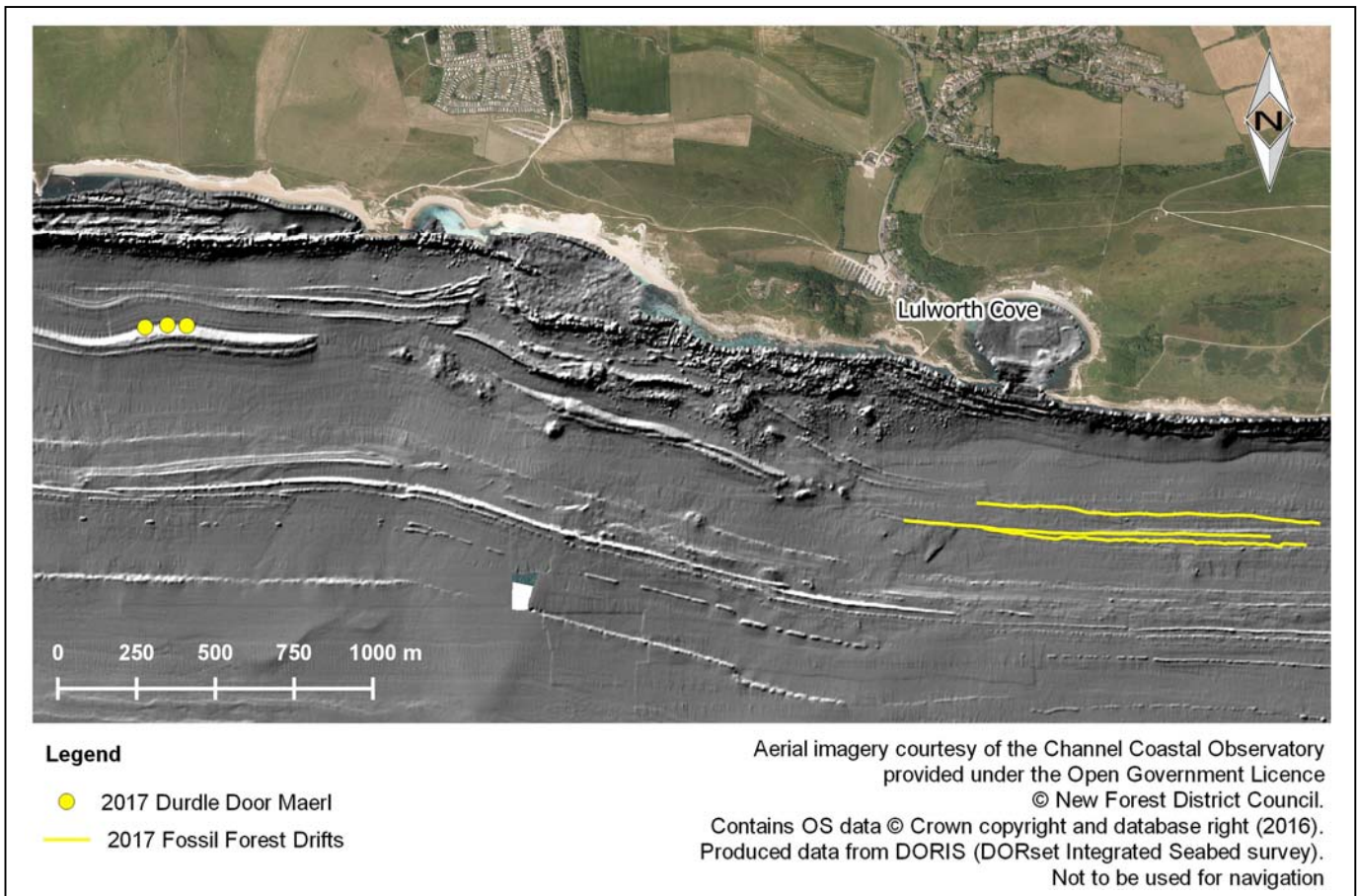
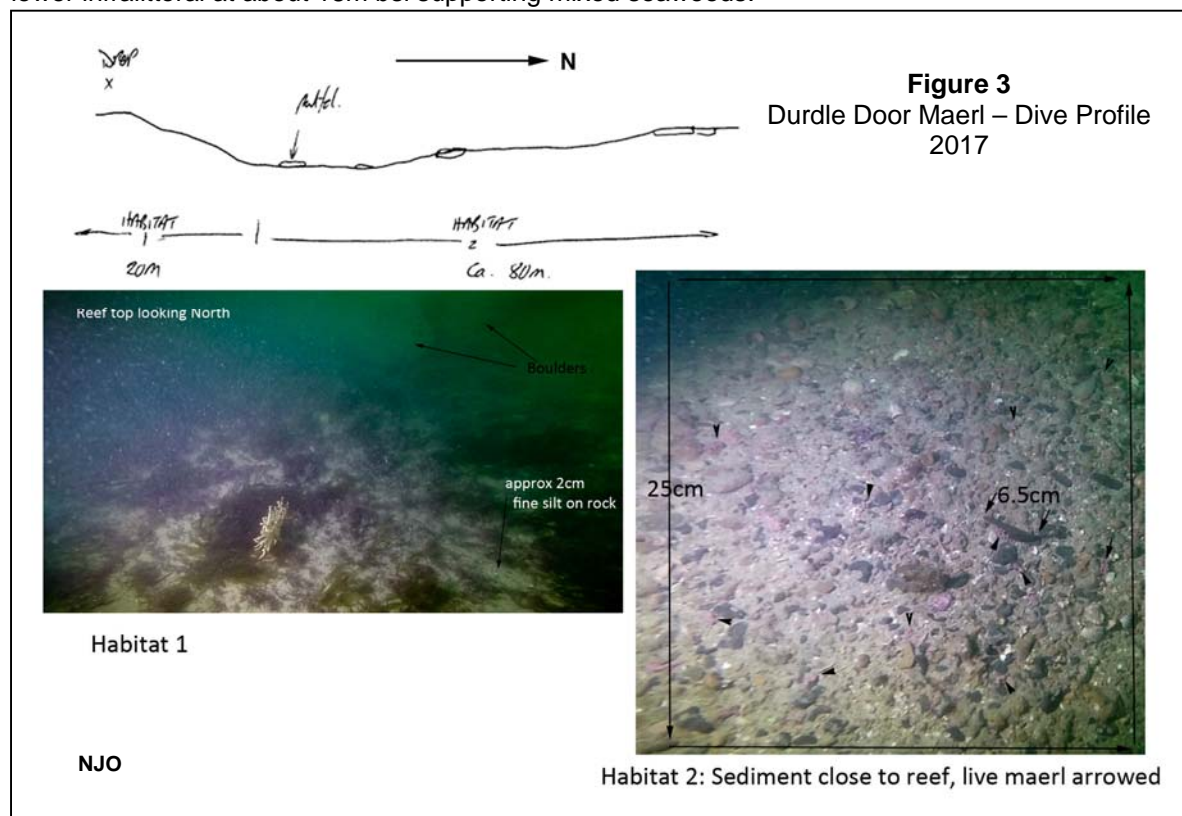


Figure 2
Location of 2017 dive sites within the Purbeck Coast pMCZ

Durdle Door Maerl

This site was dived on 5th August 2017. Divers were dropped on the edge of the dip slope of a silty bedrock reef approximately 100m apart, they then moved north for up to 100m onto mixed sediment with patchy dead maerl gravel (up to 20%) and a low proportion of live maerl (~5%). The mixed sediment formed a veneer over level mudstone bedrock over much of the area surveyed with low rock ledges in the lower infralittoral at about 18m bsl supporting mixed seaweeds.



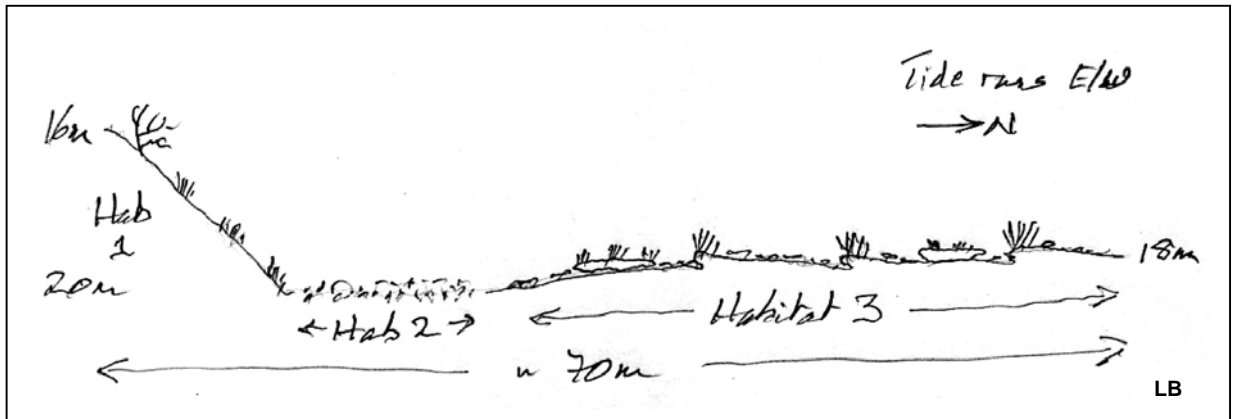


Figure 4
Durdle Door Maerl - Dive Profile 2017

The nationally scarce Trumpet Anemone (*Aiptasia couchii*) was present at the site recorded as being rare to occasional. The non-native Leathery Sea Squirt (*Styela clava*) was recorded rarely on the bedrock reefs while Pink Seafans (*Eunicella verrucosa*) were reported as rare on the main bedrock reef. A few very small colonies were noted, probably about 2-3 years old. The scarce, under recorded red seaweed *Xiphosiphonia ardreana* was recorded as rare to occasional on the level, silty bedrock.



Sparse live maerl in mixed sediment



Mixed sediment



Sparse live maerl in mixed sediment



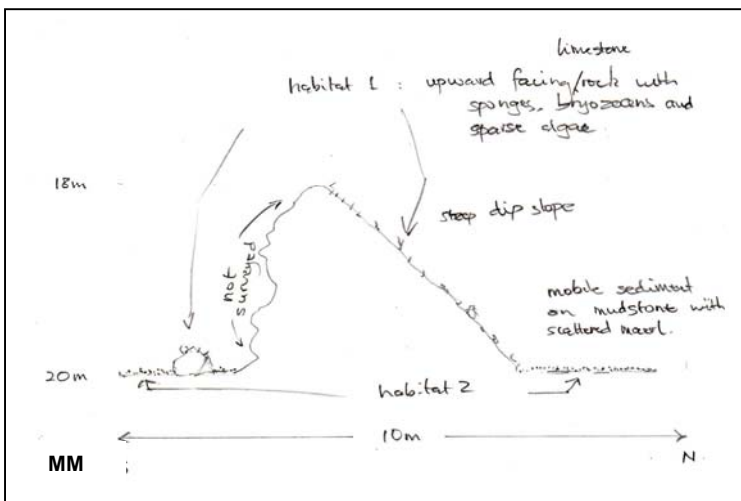
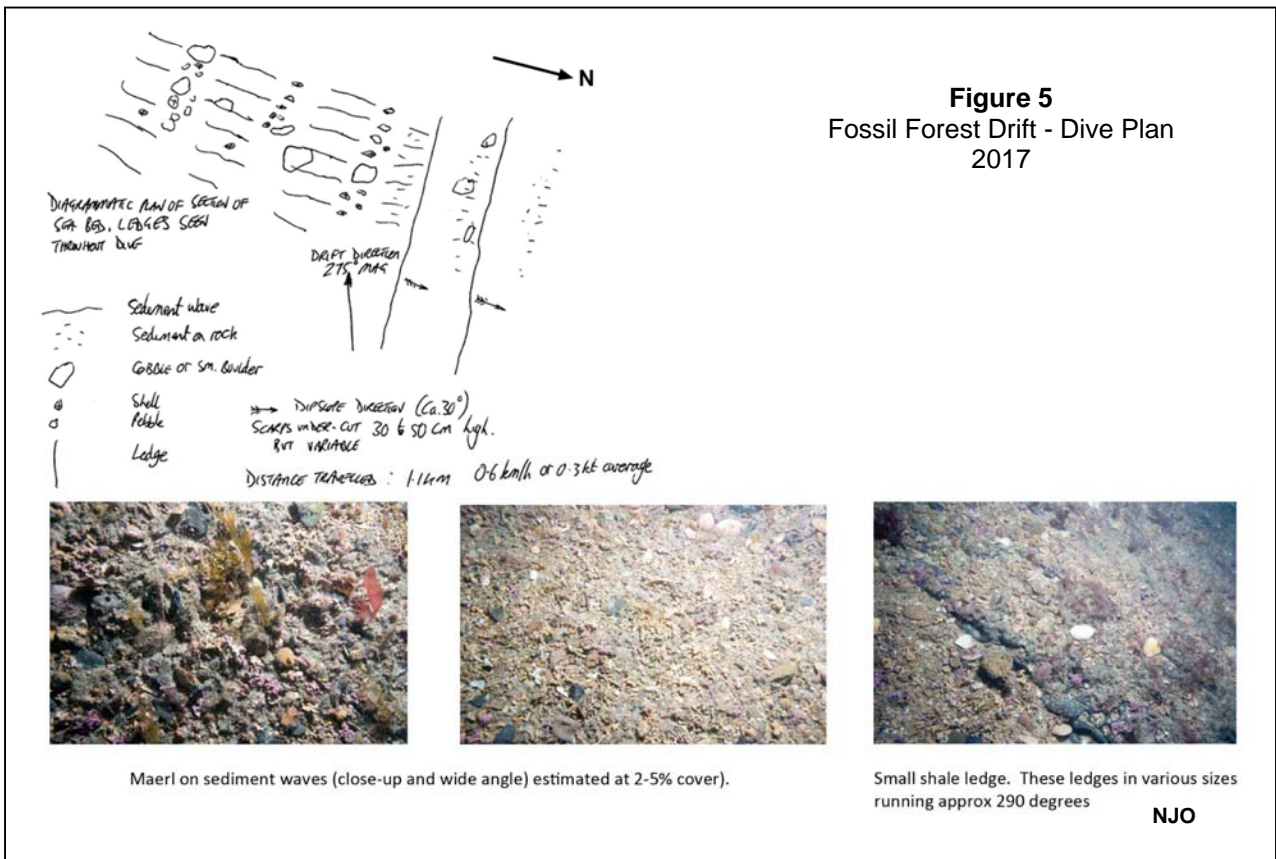
Dragonet on mixed sediment with maerl

Fossil Forest Drift

The location was surveyed on 6th August 2017. Divers were dropped to the east of Lulworth Cove in about 20m water depth and drifted west for up to 1km. Three diver pairs towed waterproofed GPS units thus providing precise details of the dive track. Inspection of the dive tracks showed them running over rugged bedrock reefs interspersed with areas of level seabed.

Georeferenced images indicated that the flat areas comprised slightly silty, coarse sediments, some with quite a high component of live maerl (2-5%) together with a significant proportion of dead maerl gravel (up to 50%). The low sediment waves were orientated approximately east/west and formed a veneer a few centimeters thick over piddock-bored mudstone bedrock. The epifauna in this habitat could not be studied in detail because of the speed of the drift (over 0.5 knot).

The reefs comprised intermittent, low limestone bedrock ledges with the scarp facing south and the dip slope to the north. Ledges were undercut in places where softer mudstone had been eroded away. Fauna was dominated by sponges (notably *Hymeniacidon perlevis* and *Dysidea fragilis*), sponge crusts, hydroids, bryozoa especially *Chartella papyracea* and very large colonies of the Potato Crisp bryozoan (*Pentapora foliacea*).





Fossil Forest Drift – rocky reef fauna
(above and left below)



Fossil Forest Drift – maerl and coarse sediment
(above and centre right)

The nationally scarce Trumpet Anemone (*Aiptasia couchii*) was recorded as being rare to occasional on the rocky reef. No non-native species were recorded by any of the divers on the drift dive.

Historical Records of Mixed Sediment with Maerl

There are a number of widely dispersed historical records in the Purbeck Coast pMCZ of mixed and coarse sediments some with relatively high concentrations of maerl. Locations within the pMCZ where maerl has been reported during Seasearch dives are shown in Figure 1. Further locations with relatively high maerl concentrations are known which have been identified during other subtidal survey work in the pMCZ and some of these sites have been monitored for over 15 years by Dr K. Collins, Department of Ocean and Earth Sciences, University of Southampton.

Biotores recorded by divers in 2017 (Durdle Door & Fossil Forest)

Cirralittoral Sediment

- **SS.SMx.CMx** Cirralittoral mixed sediment
- **SS.SCS.CCS** Cirralittoral coarse sediment
- **SS.SMx.CMx.CIlOMx** *Cerianthus lloydii* and other burrowing anemones in cirralittoral muddy mixed sediment

Sublittoral Rock

- **IR.HIR.KFaR.FoR.Dic** Foliose red seaweeds with dense *Dictyota dichotoma* and/or *Dictyopteris membranacea* on exposed lower infralittoral rock
- **CR.HCR.XFa** Mixed faunal turf communities

Conclusions

The data presented for the survey dives carried out in 2017 and historical data, both from Seasearch and other subtidal marine surveys from the wider area within the Purbeck Coast pMCZ indicate that both mixed and coarse sediments are widely distributed within the site. The conclusion is that these proposed designated subtidal features for the Purbeck Coast pMCZ namely subtidal coarse sediment, subtidal mixed sediment and maerl-rich sediments are well represented within the pMCZ boundaries.

Acknowledgements

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References

- Carr, H., Cornthwaite, A., Wright, H. and Davies, J. (2016) Assessing progress towards an ecologically coherent MPA network in Secretary of State Waters in 2016: Results. Joint Nature Conservation Committee, 27pp. http://jncc.defra.gov.uk/PDF/JNCC_NetworkProgressInSoSWaters_2014.pdf [Accessed 31/10/2017].
- Joint Nature Conservation Committee (2017) Sublittoral mixed sediment. <http://jncc.defra.gov.uk/marine/biotores/biotope.aspx?biotope=JNCCMNCR00002038> [Accessed 17/11/2017].
- Joint Nature Conservation Committee (2017) Sublittoral coarse sediment. <http://jncc.defra.gov.uk/marine/biotores/biotope.aspx?biotope=JNCCMNCR00002034> [Accessed 17/11/2017].
- Natural England and Joint Nature Conservation Committee (2010) Marine Conservation Zone Project: Ecological Network Guidance. http://jncc.defra.gov.uk/pdf/100705_ENG_v10.pdf [Accessed 31/10/2017].

Spotted Ray on coarse sediment Fossil Forest Drift

