FOOTPRINT ECOLOGY

Recreation impacts and the Lyme Bay and Torbay Special Area of Conservation / Marine Conservation Zone

Durwyn Liley and Emma Bishop

FOOTPRINT ECOLOGY, FOREST OFFICE, BERE ROAD,
WAREHAM, DORSET BH20 7PA
WWW.FOOTPRINT-ECOLOGY.CO.UK
01929 552444

Footprint Contract Reference: 674
Date: 13th September 2022
Version: Final
Recommended Citation: Liley, D. & Bishop, E. (2022). Recreation impacts and Lyme Bay and Torbay Special Area of Conservation. Report by Footprint Ecology.

Summary

This report has been commissioned by Torbay Council to inform the update of their Local Plan and how the Council should respond to individual planning applications with respect to the Lyme Bay and Torbay marine Special Area of Conservation (SAC) and Marine Conservation Zone (MCZ). The site qualifies as an SAC for the reefs and sea caves, while the MCZ includes a wider range of coastal and marine habitats and species. The Local Plan Update will mean an increase in local housing and may include tourism related policies. One of the key reasons people are likely to move to the area, visit is the draw of the coast. Recreation could pose a risk to the nature conservation interest of the respective sites.

This work is an initial, desk-based review to identify risks, consider any steps that may be required by the Council and what further evidence, if any, needs to be gathered.

The Local Plan Update will require Habitats Regulations Assessment (HRA) and we highlight that it may be difficult for this to rule out adverse effects on integrity from increased recreation use on the SAC. In particular, the sea caves are unique within the UK and contain very sensitive fauna that are potentially highly vulnerable to damage. Risks for the caves relate to damage from people accessing for wild swimming, kayaks, paddleboards, personal watercraft, diving, coasteering and people accessing the shoreline on foot at low tide. While these are potentially relatively niche activities and many caves are well hidden or difficult to access, some are very accessible and risks for some caves cannot be ruled out. Very small levels of use can have an impact. Our review of social media and websites highlights that the caves are perhaps becoming better known and more promoted. It appears that they are visited by some organised groups/recreation providers and by casual visitors exploring the coast. Such use could include local residents.

A range of measures are set out that include further evidence gathering, monitoring and protective measures as necessary. These measures provide a package of interventions that could be set up as a strategic mitigation approach, whereby developer contributions provide the resources to secure the mitigation. This would enable the HRA for the Local Plan Update to rule out adverse effects on integrity from recreation and ensure individual Habitats Regulations Assessments at the project level are not overly complex. At project level the costs for mitigation would be clear and upfront. We also consider the implications for individual planning applications that come forward now, and highlight that a case-by-case approach to project level HRA will be necessary.

Seagrass beds are a feature of the MCZ and are also vulnerable to recreation impacts. Risks relate primarily to damage from anchors, also from people on foot (Torre Abbey area) and from propellers and wash from boats in the shallower water areas. Various initiatives are in place to protect the seagrass beds and the maps of sensitive areas are widely promoted. There are a limited number of eco-buoys (that allow boats to moor without damaging anchors) in place at only one of the seagrass beds (Fishcombe Cove) and risks for this habitat from increased pressure are therefore relevant to the Local Plan. We recommend monitoring

of anchoring, provision of additional eco-moorings and other protective measures as necessary.

Contents

Acknowledgements

This report has been commissioned by Torbay Council and we are grateful to Rose Bailey-Clark, Tracy Brooks and Ashwag Shimin, for their support and overseeing the commission.

Our thanks also to the following who have shared information, their knowledge, expertise and ideas: Melanie Border (Geopark), Jay Boyle (Natural England), Malcolm Hart (University of Plymouth), Rob Parsons (Torbay Harbour), Simon Pinder (Torbay Harbour), Chris Procter, Peter Tinsley and Warwick Saunders. Chris Procter's depth of knowledge and experience of the sea caves has proved invaluable.

1. Introduction

Overview

1.1 This report has been commissioned by Torbay Council to inform the Local Plan Review and to inform how the Council should respond to individual planning applications with respect to the Lyme Bay and Torbay marine Special Area of Conservation (SAC) and Marine Conservation Zone (MCZ). The report is an initial review to identify risks, consider any steps that may be required by the Council and what further evidence, if any, needs to be gathered.

The Lyme Bay and Torbay SAC and MCZ

1.2 The Lyme Bay and Torbay SAC extends to over 31,000ha (split into two discrete areas) within the Western English Channel off the coast of Devon and Dorset (Map 1). The site qualifies as an SAC for two marine habitat types[1]:

- Reefs; and
- Submerged or partially submerged sea caves.

1.3 The SAC supports a wide range of reef and sea cave habitats. The reef features extend over a large area as outcropping bedrock slightly offshore. Softer sediment habitats are commonly found between the bedrock or cobble / boulder areas. The reefs have particularly high species richness including hydroids, bryzoans, sea squirts, erect sponges and corals. Key species include the Sunset Cup Coral *Leptopsammia pruvoti*, Scarce Sponge *Adreus fascicularis* and the Pink Sea Fan *Eunicella verrucosa*.

1.4 There are a wide range of caves that occur in several different rock types, and at levels from above the high water mark of spring tides down to permanently flooded caves lying in the infralittoral zone. Examples of the classical wave-eroded sea caves are found across the SAC and there are also solution cave systems, where limestone has been dissolved by ground water and the caves are then flooded by the sea. Some of the solution caves (those on Berry Head) have a very unusual morphology, whereby they

[1] See relevant page on Natural England designated sites view for full list of designated features and further information.

formed in a coastal environment in a shallow fresh or brackish water layer overlying a deep seawater aquifer (Procter, 2009). Such caves occur in very few places in Britain and Ireland. This diversity of cave types includes some caves which are very stable inside and provide a range of conditions. Surfaces and walls inside the caves host a variety of sponges, bryozoan crusts, pink sea fingers, anemones and cup corals. The overhangs, holes and recesses are home to some notable species such as the sponge *Geodia cydonium*. The caves and their biodiversity interest have been extensively surveyed and documented by Procter (2009).

1.5 Torbay MCZ is an inshore site covering around 20km^2 from Oddicombe Beach to Sharkham Point (Map 1). From the shoreline, the site boundary extends to a depth of 30m encompassing Hope's Nose near Torquay and Berry Head near Brixham.

1.6 The site is designated for a number of intertidal and subtidal habitat features including sediments, rock and seagrass beds[2]. The site's seabed hosts good communities of heart urchins and brittlestars, while its intertidal rocky reefs support anemones, native oysters, sponges, sea squirts and the uncommon peacock's tail weed. Seagrass beds provide a habitat for a wide range of animals such as seahorses and pipefish which shelter amongst the leaves. The area is important for breeding bird colonies.

Legislative context

European sites

1.7 SACs are part of the national network of 'European sites' [3]; they are the most important sites for nature conservation, form the cornerstone of UK nature conservation policy and are afforded the highest degree of protection in domestic policy and law.

1.8 The designation, protection and restoration of European sites is embedded in the Conservation of Habitats and Species Regulations 2017, as amended, which are commonly referred to as the 'Habitats Regulations'. Importantly,

[2] See relevant page on Natural England designated sites view for full list of designated features and further information and also the factsheet for the site produced by Defra.
[3] This term is long established in government policy e.g. ODPM Circular 06/2005: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System (16 August 2005), to be read in conjunction with the current NPPF, other Government guidance and the current version of the Habitats Regulations.

the most recent amendments (the Conservation of Habitats and Species (amendment) (EU Exit) Regulations 2019 [4]) take account of the UKs departure from the EU.

1.9 The overarching objectives of the national network is to maintain, or where appropriate, restore habitats and species listed in Annexes I and II of the Habitats Directive to a Favourable Conservation Status, and contribute to ensuring, in their area of distribution, the survival and reproduction of wild birds and securing compliance with the overarching aims of the Wild Birds Directive.

1.10 The appropriate authorities must have regard to the importance of protected sites, coherence of the national site network and threats of degradation or destruction (including deterioration and disturbance of protected features). The strict protection afforded to European sites means that any plan (including Local Plans) or project where there are likely significant effects (alone or in-combination with other plans or projects) must be subject to appropriate assessment. The plan or project should only be given effect where adverse integrity (alone or in-combination) can be ruled out (or particular exception tests apply).

MCZs

1.11 MCZs are a type of marine protected area designated under the Marine and Coastal Access Act 2009. MCZs protect nationally important marine wildlife, habitats, geology and geomorphology.

1.12 A range of public authorities have responsibility for the regulation of activities occurring in the sea and on the coast and these include Local Authorities alongside bodies such as the Marine Management Organisation (MMO) and the Inshore Fisheries and Conservation Authorities (IFCAs). Where the functions of a public authority have the potential to impact on an MCZ, the Marine and Coastal Access Act (2009) places an obligation on the authority to carry out its functions in a manner that best furthers the conservation objectives of the MCZ[5]. Where this is not possible, the public

[4] The amending regulations generally seek to retain the requirements of the 2017 Regulations but with adjustments for the UK's exit from the European Union. See Regulation 4, which also confirms that the interpretation of these Regulations as they had effect, or any guidance as it applied, before exit day, shall continue to do so.

[5] See section 125 of the Marine and Coastal Access Act

authority is required to proceed in the manner that least hinders the achievement of the MCZ's conservation objectives.

Torbay Local Plan Update

1.13 The strict protection afforded to European sites and to MCZs must be taken into account by Torbay Council when granting permission or implementing any plan or project.

1.14 The Council is currently working on update to the 2012/2030 Local Plan[6] and has resolved to update policies relating to housing supply. Using the Government's Standard Method, Torbay's housing need is around 560-600 homes a year. In 2021, the Council consulted on five different broad spatial options to deliver new homes. As such the overall quantum of growth and locations are yet to be defined.

The need for this report

1.15 Increased housing growth will mean an increase in the local population and the potential for increased recreational use of the coast. Tourism related development and development with direct access to the coast may pose particular risks. Recreational activities such as coasteering, climbing, kayaks, diving and boat use could bring more people to the SAC/MCZ and there may be impacts associated with the increased use, such as damage from anchoring or footfall (given that some of the caves are accessible on foot). Links to development are likely to relate to very specific locations and types of applications, however at the moment there is little evidence to identify where and what types of issues/risks are of particular concern.

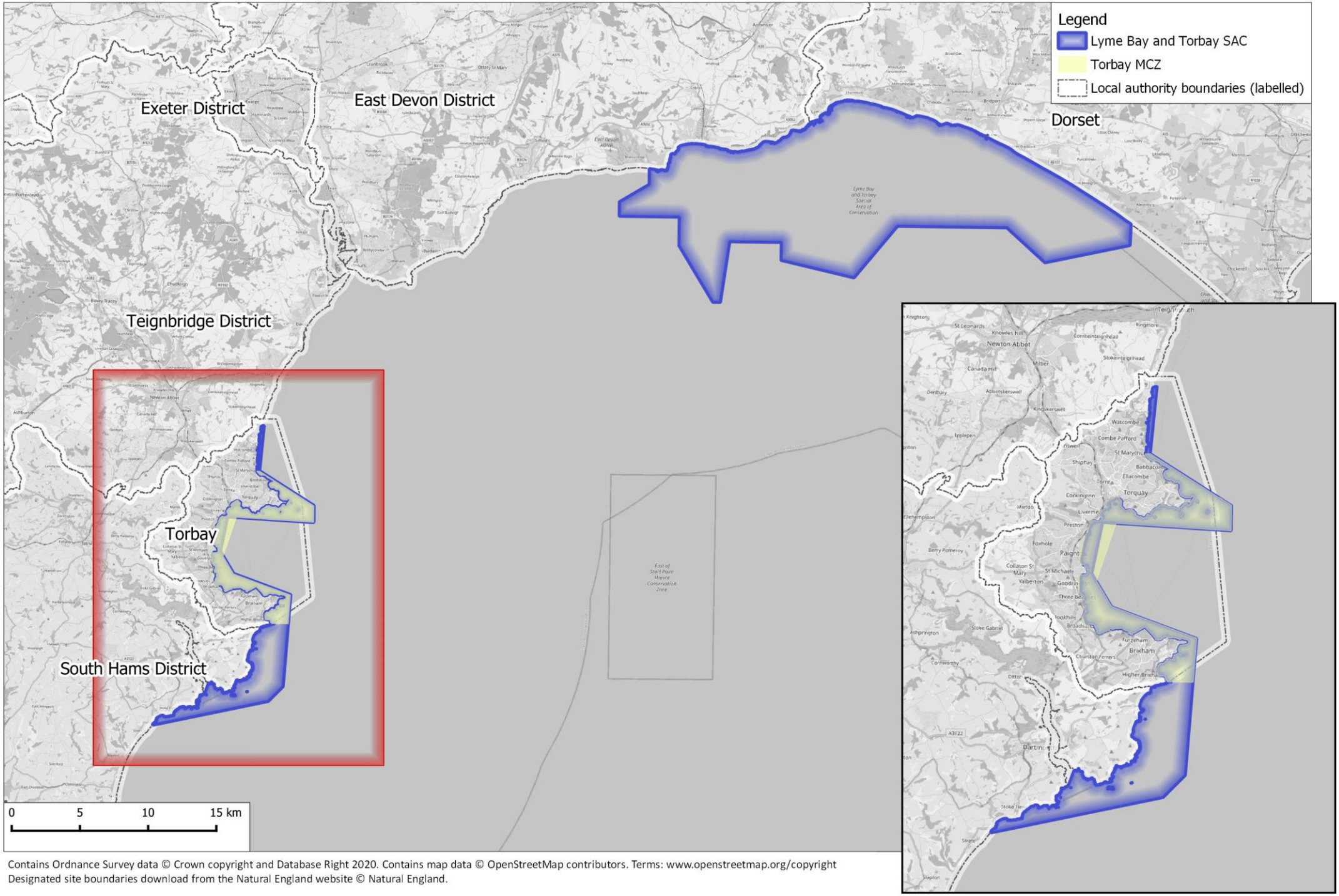
1.16 Natural England have raised the issue of increased recreational pressures on the Lyme Bay and Torbay SAC and the MCZ during the consideration of several recent Torbay planning applications. Natural England have advised that mooring and anchoring pose a risk to the SAC particularly in relation to the reefs and the seagrass beds (which are not an SAC qualifying feature but are within the MCZ).

1.17 The coast and seas are clearly part of the identity of Torbay and draw people to the area to live and work. The Local Plan needs to ensure that adequate protection is in place to rule out likely significant effects on the SAC or

[66] See Local Plan website for latest information

ensure that there are no adverse effects on site integrity, alone or in-combination. Torbay Council have therefore commissioned this report to review the potential risks, identify any issues of particular concern and as relevant set out any further evidence gathering or mitigation measures that need to be established.

Map 1: Overview



2. Our approach

2.1 Our approach has involved the following:

- Discussions with key parties, involving local cave experts, Natural England, Council Officers and Torbay Harbour staff to provide information on potentially sensitive locations, types of activity that might be a concern and any indication of levels of use and other visitor survey data.
- Collation of GIS data to show the distribution of qualifying features, sensitive locations, accessible features and key access points. These data help to inform where impacts can occur and where there are risks.
- Literature review, drawing on grey literature, peer-reviewed studies
- Checks of the internet for information on how people use the coast and where they go.

2.2 We draw these information together to summarise the issues, the risks from Plan-led growth and the implications in terms of further evidence gathering or mitigation.

3. Recreation use of the SAC/MCZ in Torbay area

3.1 In this section we summarise the recreation use of the area. Torbay is known as the English Rivera and recreation around the coast is a key draw for many residents and visitors alike. We identify the following types of recreation activity that might involve people accessing the SAC/MCZ for recreation:

- Coasteering;
- Climbing;
- Walking/foot access around the base of the cliffs;
- Fishing from the shore;
- Kayaks and stand-up paddleboarding;
- Boats of all kinds;
- Swimming ('Wild Swmming');
- Diving.

3.2 Many participants in the above activities will do so off their own back and visit independently of any group or organisation. Some use may even be opportunistic – such as people walking around the base of cliffs. One or two of the activities, in particular coasteering and diving will predominantly take place through commercial providers.

3.3 Some examples of providers and opportunities to undertake the above as part of organised groups or promoted examples are listed in Table 1. The table is not intended to be exhaustive nor to highlight organisations that are thought to cause harm or damage to the SAC or MCZ. Many of the providers are accredited by Wise[7] or other bodies and their livelihoods depend on the ability to show people wildlife and inspiring places. Nonetheless, the list highlights the range of activities and opportunities, many of which specifically feature wild camping on the beaches, foraging and visiting the caves.

3.4 The sea caves are promoted for wild swimming in the Tor Bay Authority Maritime Guide[8].

[7] See https://www.wisescheme.org/

[8] https://www.tor-bay-harbour.co.uk/media/1080/harbour-guide.pdf, accessed 10th March 2022

Table 1: Examples of relevant recreation providers and opportunities from websites (accessed 1st March 2022). Locations are indicative and not exhaustive.

Provider	Activity	Locations	Notes
Reach outdoors	Coasteering	Ansteys Cove, Daddyhole	Offers opportunity to explore places unknown to others on a full kayak and coasteering day
Rock solid coasteering	Coasteering	Not specified	Safaris and tours by RIB and involving exploring different caves
Go coasteering	Coasteering	Ansteys Cove, Daddyhole, ,	Website also promotes the 'Torquay traverse' and a sea zip line
Blue dot adventure	Coasteering	Torquay area	Extends to military groups and adventure training
Reach outdoors	Kayak tours	Berry Head & Sharkham Point	Tours include wild camping on beach and exploring sea caves
Sea Kayak Torbay (see also Beyonk)	Kayak and paddleboard tours	Locations include Babbacombe Bay, Ansteys Cove, Hopes Nose, Berry Head	Tours can include wild camping on beach and foraging, adventures to explore limestone and sandstone caves and tours to include guillemot colony
Sea kayak Devon	Kayak and paddleboard tours	Brixham – Paignton and Berry Head	Includes wild camping on beach and foraging
wesup	Sit on kayak hire	Abbey sands beach	
Paignton canoe club	Kayak tours for members		Club that promotes kayaking in area
Reach outdoors	Giant stand up paddleboards	Roundham Head	Giant SUP take 8 people. Tours offered alongside cliffs and to hidden beaches
Funfish trips	Boat trips, taking people to see wildlife, fishing and diving	From Brixham Harbour	Boat too large to enter caves
Torquay watersports	RIB rides	Various, Paignton, Elberry Cove, Brixham, Paignton	Tours include the raptor (triple engine 'fastest passenger RIB in England') and smaller RIB tours that include sea caves, dolphin and seal spotting etc
Torquay watersports	Swimming tours	London Bridge (sea arch), Meadfoot Beach, Shag Rocks to Thunder Hole, Thatcher Rock and the Ore Stone Cove, Long Quarry Point to Babbacombe Beach, Watcombe Head Cave and the Bell Rock	Guided swimming tours where taken out by RIB to different parts of the coast. Includes opportunity to swim in caves
PWC safaris – jet set go	Personal watercraft safaris	Not specified	90 minute safaris by personal watercraft exploring coastline
Dive Torquay	Scuba diving	Meadfoot beach	Scuba diving training, courses and equipment hire
Jennifer Ann charters	Dive charter boat	Locations include Thatchers Rock and the Ore Stone	
The Shoreley Wild Swimming Tobay	Wild Swmming	Petit Tor, Anstey's Cove, London Bridge, Meadfoot Beach	A guide to wild swimming locations. Promotes a route into Dove Cave (Petit Tor) and climbing within the cave

Access infrastructure

3.5 There are numerous beaches with easy access and numerous other paths providing access to the shore. We have attempted to map these in Map 2, which is drawn from OpenStreetMap data and a review of aerial images. It is not intended to be a comprehensive map of all access points, but the foot access to shore points indicate where there are paths visible on the maps/imagery that suggest it is possible to access the shoreline. Some paths are informal and potentially difficult to follow. Also shown on the map are car parks and boat launching points.

3.6 Information on slipways and access to the water are provided in the Tor Bay Authority Maritime Guide[9]. This recommends Paignton Preston, Goodrington, Broadsands, Breakwater and Meadfoot as good launching points for kayaks. There is dry storage for kayaks at Paignton Harbour and Brixham Harbour.

Visitor data

3.7 Estimates of visitor numbers to Torbay pre-Covid were produced on behalf of the Devon Tourism Partnership by the South West Research Company[10] and indicate that in 2019 there were:

- 1,110,100 staying visitor trips (4,320,300 staying visitor nights);
- 3,434,000 day visitors.

3.8 These visits generated a total estimated visitor spend of nearly £433 million. Around 17% of all employment in Torbay at the time was estimated to be tourism related.

3.9 An online survey[11] conducted amongst the English Riviera Business Improvement District's consumer email database in 2021 captured data on those who visited the resort during 2021. These results indicate that:

- 39% of respondents were aged 65+, 32% were aged 55-64 and 24% were 54 years or under, suggesting a relatively senior age profile;

---

[9] https://www.tor-bay-harbour.co.uk/media/1080/harbour-guide.pdf, accessed 10th March 2022
[10] Powerpoint file dated November 2020, https://www.englishrivierabid.co.uk/2019-visitor-data/, accessed 3rd March 2022
[11] Powerpoint produced by the South West Research Company for English Riviera Business Improvement District, https://www.englishrivierabid.co.uk/english-riviera-visitor-survey-2021/ accessed 3rd March 2022

- 88% had stayed overnight in the resort with the average duration of stay 7.1 nights;
- 30% of 2021 visits took place during September, 27% during July and 25% during August;
- 84% had visits the beach/sea and for 23% of respondents this was the main reason for visiting;
- Activities that visitors hadn't taken part in during their visit to The English Riviera, but which appealed to them, includedy outdoor sports/pursuits (49%) and/or taking part in water-based activities (46%).

3.10 The English Riviera Destination Management Plan was informed by a range of visitor surveys and other evidence (Torbay Council, 2017). The visitor surveys confirm Torbay's seaside attraction as the biggest natural asset and why people are visiting the area. Torquay seafront was identified as the most popular area to visit with 79% of interviewees[12] visiting or intending to visit it; the second most popular was Torquay Harbour (71% visiting or intending to visit). 14% of interviewees had visited or were intending to visit the South West Coast Path, 45% indicated they were planning to spend half a day or more on the beach and 36% indicated they had (or intended to do) a long walk of more than 2 miles.

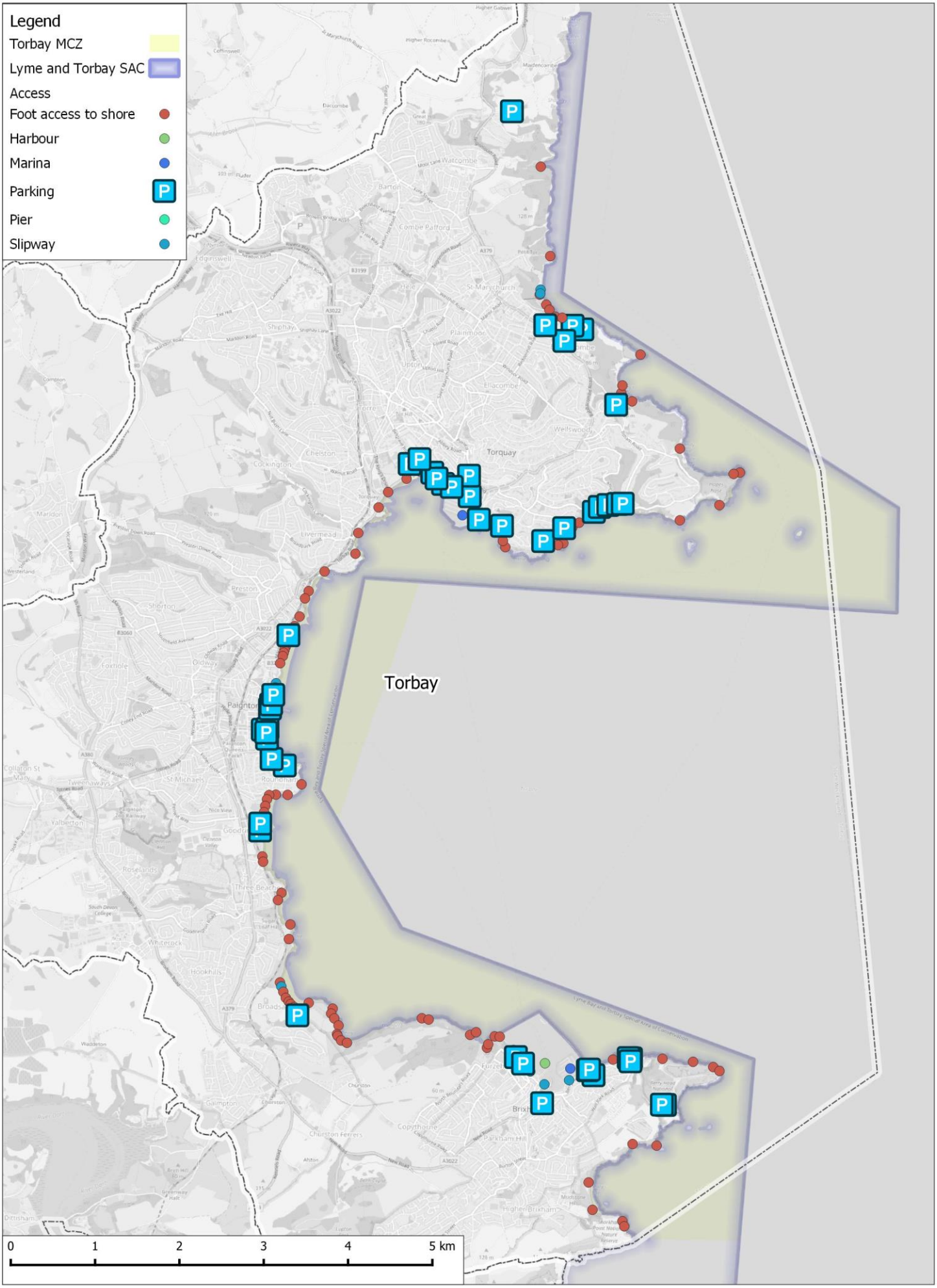
3.11 A face-to-face visitor survey at Berry Head during July and August 2016 interviewed 266 people near the car park and the fort. Most (60%) of interviewees were visiting directly from home and around a third (36%) were on holiday in the area. Activities conducted by interviewees during their visit that day included fishing (8% of interviewees), exploring (2%), climbing (1%), kayaking and swimming (1 interviewee for each activity). Maps of interviewee's routes indicated that a proportion, particularly those fishing were accessing the lower cliff areas.

3.12 Monitoring of bait harvesting in the Torbay area has been conducted by Devon and Severn IFCA (Curtin, 2019) highlights that the area is popular with anglers and the easily accessible mudflats mean that it is an important area for bait harvesting. The monitoring recorded mainly bait digging for Lugworm and also some collection of Ragworm at Goodrington. Levels of use were however relatively low with a maximum intensity of 1 bait digger per hour at 1 site.

[12] Visitor survey from 2016

3.13 Visits to the natural environment have shown a significant increase in England as a result of the increase in population and a trend to visit more (O'Neill, 2019). During the Covid pandemic access levels have increased further and local outdoor space has become critical for many in providing places for recreation, including space to socialise and exercise (Day, 2020; Kleinschroth & Kowarik, 2020). Looking to the future, there is some uncertainty as to how visitor use of countryside sites may change. Climate change has implications on travel choices and visitor behaviour (Amelung et al., 2007) and people staying within the UK and spending more time exploring the outdoors (Mackintosh et al., 2018) are likely to be strong drivers of recreation patterns and use at Torbay in the near future.

Map 2: Access infrastructure



4. Risks from recreation to the SAC/MCZ

4.1 In this section we summarise the potential impacts to the qualifying features.

Distribution of qualifying features

4.2 The distribution and extent of qualifying features of the SAC and MCZ are summarised in Table 2.

Table 2: Distribution of relevant features. Grey rows indicate SAC qualifying features while others are MCZ only. Area figures where given are taken from the supplementary conservation advice for the SAC[13] or MCZ[14] as relevant.

Qualifying features	Distribution
Reefs	15,591ha of reef in total within the SAC, including those in Lyme Bay. The Mackerel Cove to Dartmouth reefs are relevant to Torbay and extend from Mackerel Cove to Landcombe Cove.
Submerged/partially submerged sea caves	Caves occur from Mackerel Cove to Sharkham Point. The Devon and Cornwall Sea Cave registry[15] provides a searchable database and map links of sea caves for the area. Natural England's Conservation Advice refers to 85 individual caves which form 24 cave complexes; other sources (e.g. Procter 2009) refer to nearly 200 caves on the Torbay coast. Some are undescribed.
Intertidal coarse sediment	Only found inside the high energy coves around the headlands of Hopes Nose and Berry Head. Around 6ha present in 2013.
Intertidal mixed sediments	Recorded on the south stretch of Goodrington Sands; 20.6ha present in 2010 but none recorded in more recent surveys (in 2013).
Intertidal mud	The supplementary conservation advice indicates that there were around 51ha present in 2010 but that none were found in 2013 and gives a target area of 0.2ha.
Intertidal sand and muddy sand	Distributed throughout the MCZ. 5 biotopes present in the MCZ. Key locations include Preston Sands, Goodrington Sands, Torre Abbey Sands and Elberry Harbour and around 51ha extent.
Intertidal under boulder communities	This habitat is found from the mid-shore down to the extreme lower shore, and encompasses areas of boulders that support a diverse under-boulder community. Widely distributed and often as a mosaic habitat alongside bedrock.
Long snouted seahorse	Limited number of records, associated with the seagrass beds.
Low energy intertidal rock	Infralittoral rock in wave and tide-sheltered conditions. Only present on the mid-upper shore of the broad stretches of rock which protrude out from the northern end of Preston Sands with around 0.3ha present.
Moderate energy intertidal rock	Distributed throughout the MCZ and 5 different biotopes listed in the supplementary conservation advice which suggests around 7.5ha in total in 2013.
Native oyster	Limited number of records from across the site including from intertidal low energy rock, subtidal mud, moderate energy intertidal rock, intertidal coarse sediment and intertidal underboulder communities.
Peacock's tail	Found in rock pools on the mid to lower rocky shores on the rocky shores adjacent to Corbyns beach and Goodrington Sands.

[13] Supplementary conservation advice for the SAC on the Natural England website accessed 7th March 2022

[14] Supplementary conservation advice on the Natural England website accessed 7th March 2022

[15] https://dcuc.org.uk/registry/r/index.php

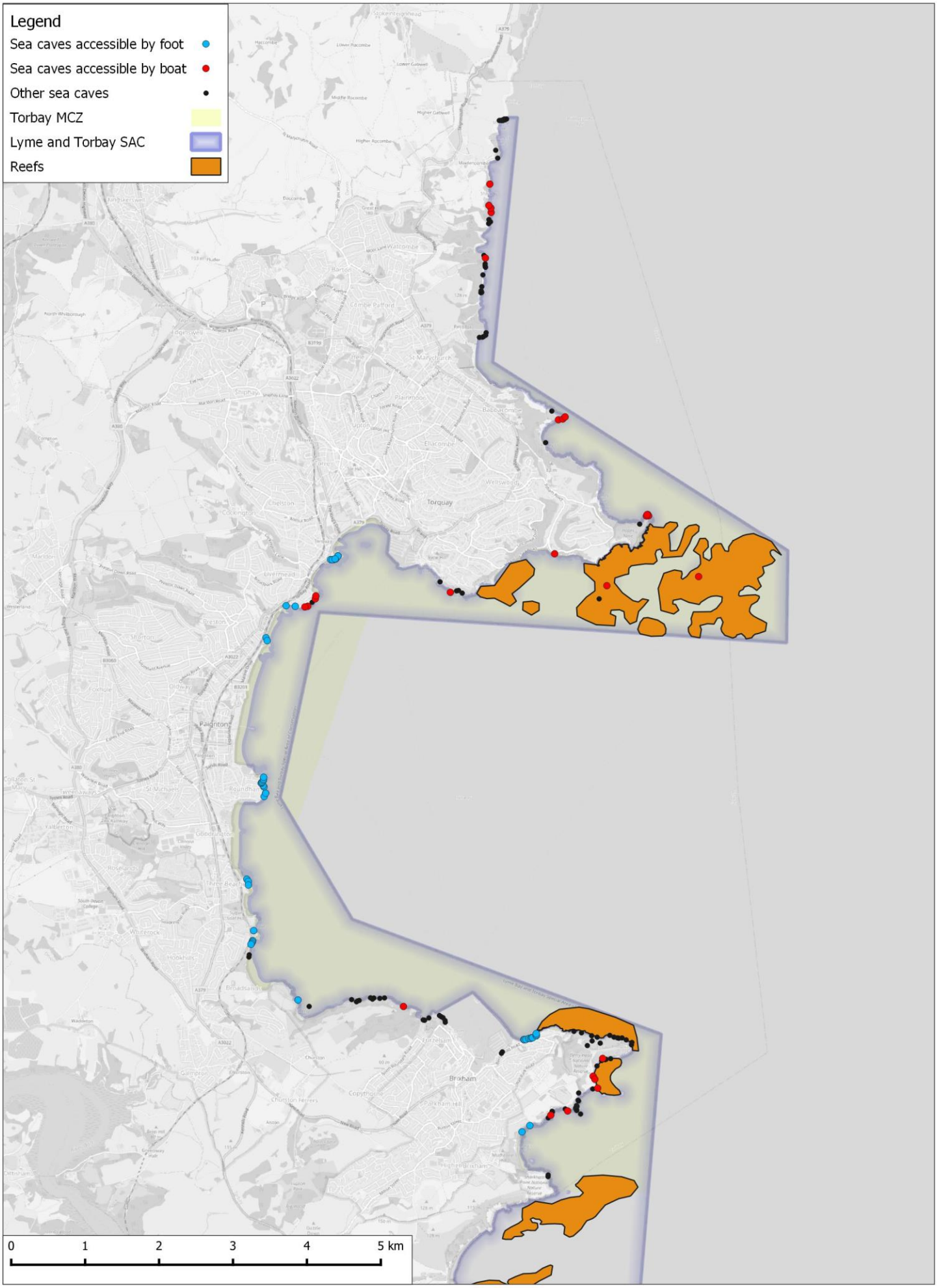
Qualifying features	Distribution
Peat and clay exposures	Rare, ephemeral features which occur when strata of peat and clay breach the surface sediment layers. Found at Torquay Beach, Goodrington Sands and Broadsands Beach.
Seagrass beds	There are 2 large seagrass beds at the site and a number of other smaller beds in coves around the bay. The largest is a *Zostera marina* bed found on the wide sandy beach of Torre Abbey Sands which is exposed on the lowest spring tides. The other large bed is at Elberry Cove. Total area around 146ha. More recent surveys define 8 known seagrass beds (Field, 2020).
Subtidal coarse sediment	Found in close proximity to Oddicombe, Broadsands, Fishcombe Cove and Breakwater Beach and also along the edges of reefs.
Subtidal mud	Widespread throughout the site and dominates the central part of the site with the bay. Around 1352ha.

4.3 Map 3 provides a summary overview of the locations of caves, drawn largely from the maps in Procter (2009). More detailed maps showing named caves have been produced as a separate annex that accompanies this report. The annex is confidential due to the sensitive nature of some of the cave locations. We have used colours to highlight those that are potentially more accessible, i.e. where the entrance can be accessed from the shore or from the water. These are indicative only and based on commentary from Torbay Council and from blogs, forums and comments on the internet. We stress that no attempt has been made to visit caves and systematically score or assess them on how easy they are to access and the dots are intended to be illustrative only. Also shown on Map 3 are the approximate distribution of reefs that are a qualifying feature of the SAC, drawn largely from the maps in the formal advice from Natural England[16]. Map 4 shows the distribution of the MCZ features. In this map the seagrass beds have been based on the most recent surveys (Field, 2020) while the other MCZ features are drawn from maps produced by Natural England[17].

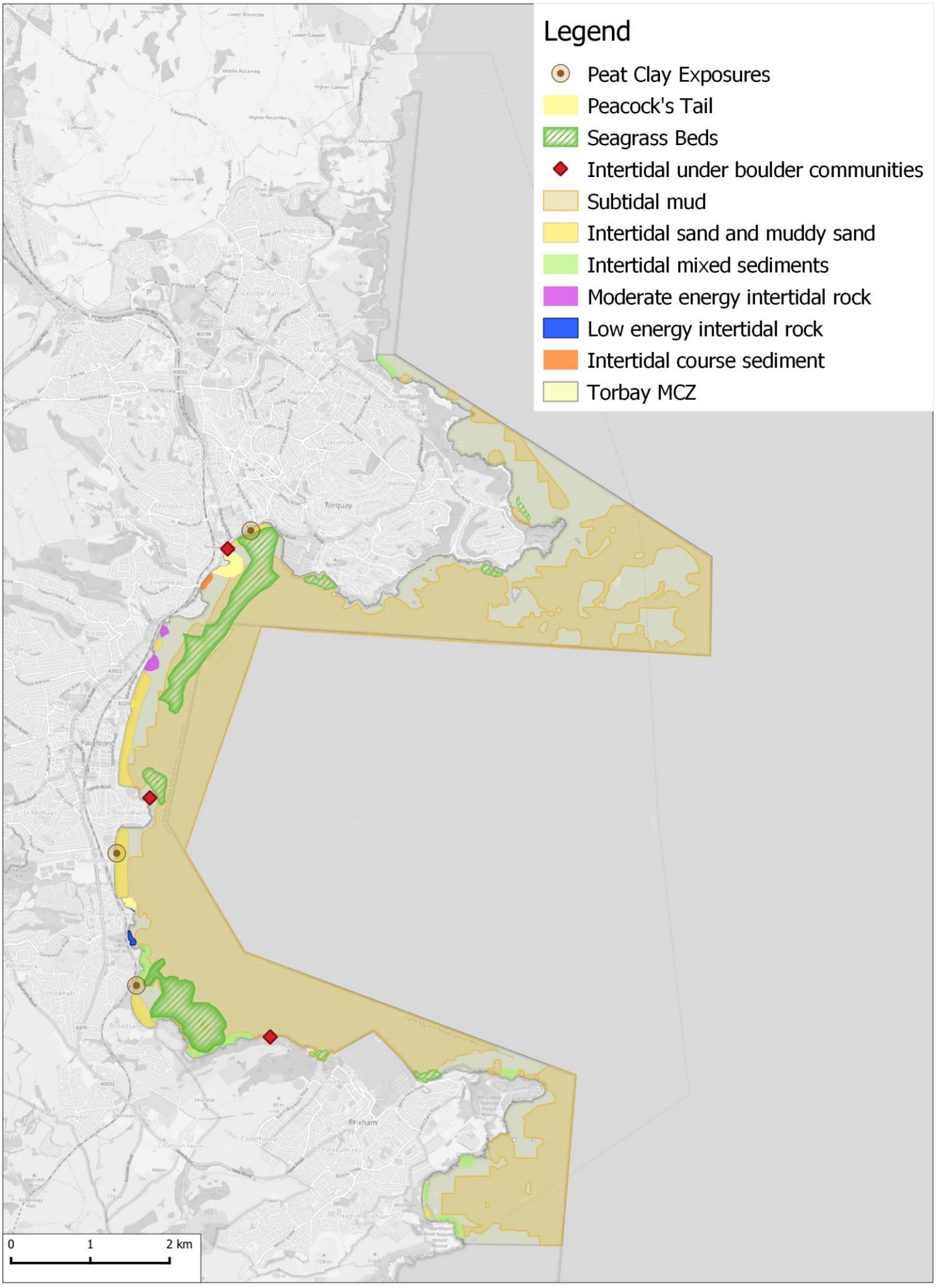
[16] See http://publications.naturalengland.org.uk/file/10389262

[17] See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/915379/torbay-mcz-feature-maps.pdf

Map 3: SAC Features: sea caves and reefs



Map 4: Approximate locations of MCZ features



Impact pathways and the ways in which recreation use might cause harm

4.5 The caves are exceptional for the diversity of species they support and the suite of rarities that have been recorded. Some species such as the marine sponge *Geodia cydonium* are only known from a handful of sites in the UK. Due to the sheltered and stable nature of many of the caves, species occur on the side walls, roofs and around the entrances, and in many areas the cave surfaces are coated with life. Some caves extend well beyond daylight and the influence of wave action and as such differ from mechanically eroded caves found in other parts of the coast. These caves have the ability to support species that are slow growing and also some more usually only associated with deep water.

4.6 These unique conditions make them sensitive to **direct damage and wear**. This can come from feet and people climbing/scrambling over rocks as well as paddles (e.g. as kayaks are manoeuvred in narrow entrances), dive equipment and fins. Such damage is well documented in the scientific literature (Addessi, 1994; Milazzo, Chemello, Badalamenti, Camarda, et al., 2002; Milazzo, Chemello, Badalamenti, & Riggio, 2002; Saunders et al., 2000) but is likely to be of particular concern in the cave systems at Torbay. This is because of the wide range of rare species present and also the particular conditions associated with the caves. Many species will occur out of the water or in much shallower water due to the dark, sheltered and moist conditions. Studies have shown the individuals in such environments are more vulnerable to trampling damage (Mendez et al., 2019).

4.7 During the surveys of the cave systems at Torbay described by Procter (2009), the presence of surveyors was sufficient to cause damage in certain locations and surveys were ceased at certain sensitive locations due to the challenges of accessing the caves without causing harm (Procter *pers. comm.*), highlighting the relative sensitivity of some locations.

4.8 The caves are, by their nature, relatively inaccessible and many are impossible to access without a boat and/or the need to swim. Within the caves themselves, the extent to which the species living on the sides, walls and ceilings might be at risk from people and boats accessing will vary from cave to cave, but only limited areas within the caves are likely to be at all easy to access. As such, the risks are perhaps low and impacts possibly localised – for example around narrow entrances or flatter areas of rock

within caves. There are no data on the scale of current impacts or the extent to which different caves are visited and what the impacts of existing recreation use might be.

4.9 It is also not clear whether the scale of any impacts would be proportional to the level of recreation use. For example, if all people accessing a single cave were to follow the same route, then the extent of damage would be expected to tail off with increased recreation use as once an area or pathway had become just bare rock any increases in recreation use would have little effect (see Monz et al., 2013 for discussion). However, if people spread out to avoid each other, seek quiet locations or vary the routes taken according to tide conditions then diffuse access is likely and impacts are likely to be more related to the overall level of use and the scale of impact increase with more people. This latter scenario cannot be ruled out.

4.10 Alongside the attrition from feet and other forms of access, damage can arise from people turning over boulders, e.g. for bait collection (Stevčić et al., 2018) or simply even people rockpooling and exploring.

4.11 Bait collection also involves **direct harvesting** which can result in the localised loss of certain species and could extend to shellfish, seaweeds and bait. Bait digging and some other forms of bait collection can also cause damage to habitat structure (e.g. with holes left unfilled) (Watson et al., 2017).

4.12 Other impacts include **contamination**, for example from litter or discarded fishing line and tackle. Hopes Nose Cave is reported to have a mass of discarded line at the bottom (Procter *pers. comm.*). There may be a very slight risk from invasive non-native species being spread by recreation use, for example species such as *Didemnum vexillum* can perhaps be spread from marinas on boat hulls.

4.13 **Damage from anchors and swing moorings** to seagrass and other habitats is well documented (Broad et al., 2020; Collins et al., 2010; Liley et al., 2012). Anchors can pull up leaves and rhizomes of seagrass (Ceccherelli et al., 2007) and can also change the structure of seagrass beds (Collins et al., 2010). Anchor scars have been measured up to 0.16m^2 (Liley et al., 2012) while Collin's (2010) study in Dorset recorded bare patches of up to 4m^2 caused by the combined effects of anchor and chain scouring. Scars of 122m^2 have been attributed to swing moorings (Unsworth et al., 2017), which comprise a weight, ground chain, riser chain and floating buoy. While potentially more

robust than seagrass beds due to the nature of the substrate, reefs may also be vulnerable to damage from anchors.

Impacts associated with particular activities

4.14 Different activities will have different likelihood of impact and the potential to affect different features.

4.15 Natural England's site improvement plan for the SAC[18] lists public access/disturbance as a current pressure and potential threat, identifying the sea caves as the feature potentially affected. The Plan states that "*A number of the coastal cave features are accessible to visitors. If access is left unregulated, coasteerers, kayakers, diver visits and casual visitors using the entrances in the coastal cliffs could impact the delicate fauna and rare species. Coasteering is growing in popularity as a sport, so the sea caves are likely to be visited more frequently in future. At least two commercial dive operators organise dives at Watcombe Sea Caves. The biological communities at risk are highly delicate.*"

4.16 There is the potential for any **foot access** to caves to cause an impact from trampling. Caves that are likely to be accessible on foot (e.g. at low tide) and indicated on Map 3. Impacts are likely to relate to only those who are relatively adventurous, and extend to **coasteering** which may also involve boats to access some areas and relatively large groups.

4.17 The potential impacts of coasteering on rocky intertidal habitats in Wales were reviewed by Tyler-Walters (2005) who highlighted that trampling was a highly localised impact that could result in damage to fucoid seaweeds, erect coralline turfs, barnacles, and resulted in an increase in bare space; in some cases creating visible paths along the shore. Rogers (2011) suggests that levels of impacts from coasteering are quite low. Natural England and the Marine Management Organisation in their national briefing note on coasteering (2017) classify the risks (from abrasion/disturbance of intertidal and shallow subtidal substratum) as low – medium, suggesting that there is a possible or observable/measurable impact and the potential to undermine conservation objectives for marine protected areas. Both Tyler-Waters and Rogers (2010) identify caves as potentially sensitive and Rogers recommends that coasteerers potentially avoid caves as best practice.

[18] http://publications.naturalengland.org.uk/publication/5932217985400832

4.18 Impacts from foot access to other habitat types will be limited to seagrass beds (see Travaille et al., 2015) and stable areas of sheltered rock supporting seaweeds and algae, and in these kinds of areas the concerns will relate to large groups or repeated regular trampling, for example in areas with a high intensity of visits for rock pooling.

4.19 Impacts from **fishing** will relate to discarded line, weights and lost tackle. Linked to fishing, bait harvesting also brings risks through habitat damage and removal of species. Collection of peeler crabs poses risks to **intertidal under-boulder communities** while bait digging will impact soft sediments (intertidal mud).

4.20 Issues with respect to **diving** will relate to caves and impacts from diving equipment and fins knocking side walls or confined spaces. Collection of shellfish and direct harvesting of marine life by divers is also possible and may extend to reef areas and other habitats. Diving has decreased in popularity in the Torbay area in recent years (Pinder *pers. comm.*).

4.21 Impacts associated with **kayaking** will relate to sea caves and locations where kayaks enter narrow spaces and there is a risk from paddles and the boats knocking against the cave sides. Kayakers will push off from cave walls and guide themselves in confined spaces by pushing off the cave sides. Kayaks dragged over seagrass beds would also be a concern but unlikely given the limited extent of seagrass beds exposed at low tide (Torre Abbey area only).

4.22 **Stand-up paddleboarding** is growing markedly in popularity, due in part to the portability of paddleboards, particularly inflatable ones (Pinder *pers. comm.*), and impacts will be similar to those identified for kayaks.

4.23 **Boat use** has the potential to damage seagrass beds through propellors, wash and anchoring. Impacts relate to swing moorings and anchors. Condition monitoring of the seagrass beds in 2019 (Field, 2020) found that the extent and distribution of the seagrass beds within the MCZ had declined, particularly at Livermead and Roundham Point. The report speculates that variations in weather may be responsible as these are the more exposed beds. The monitoring found no evidence of scarring or damage from anchoring in any of the beds. Boat use and anchoring also has the potential to damage the reefs.

4.24 **Personal watercraft ('jet skis')** potentially pose risks to seagrass beds through the wash and disturbance, and this will be the case where water is

shallow. These craft are also highly manoeuvrable and therefore may access also some caves/arches etc.

Accessibility of features and particularly vulnerable locations

4.25 Caves vary markedly as to how easy and safe they are to access. Many caves are very difficult or dangerous to enter, and some stretches of coast are inaccessible, even to the extent that the caves have not been properly surveyed (e.g. the dolorite cliffs at Black Head, Compass Cave and Oxley Head Cave; Procter, 2009). Many areas, such as around Long Quarry Point, the Ore Stone, Thatcher Rock, the stretch of cliff from the south of Berry Head to Oxley Head, Mackerel Cove Sea Caves, Neptune's Catacombs and Smuggler's Hole near Watcombe are only easily accessible by boat (Procter, 2009), while a range of others (see Map 3) are directly accessible from the shore.

4.26 Some caves have walled entrances where sea walls have been built across the entrances to slow erosion (e.g. Corbyn's Head, Livermead Head and Hollicombe Head). These walls do not necessarily exclude access and mean that the caves are sheltered inside, meaning they can support some interesting and important communities (Procter 2009).

4.27 There is clearly therefore a range of accessibility, and this may even change over time. Tide height and tide state, the type of activity and weather conditions will also affect how easy individual caves are to access. As part of this work we have not visited individual caves or tried to systematically categorize which can be accessed.

4.28 Caves that are particularly exceptional for the fauna present and therefore particularly vulnerable include:

- Dove Cave (one of the Petit Tor Caves) (north of Oddicombe Beach),
- Corbridge Cave (on the north side of Berry Head),
- Garfish Cave (on the north side of Berry Head),
- Berry Head Quarry Cave (in the centre of Berry Head)
- Compass Cave (South-western corner of Berry Head)
- Elephant Riff Cave (south of Berry Head);
- Hidden Cleft Cave (south of Berry Head).

4.29 The seagrass beds are mostly subtidal with the only ones exposed at low tide those in the Torre Abbey area.

Other impacts (not relating to qualifying features of the SAC/MCZ)

4.30 This report is focussed on the qualifying features of the Lyme Bay and Torbay SAC and also the Torbay MCZ. It is important to note that there are also wider risks from access to the coast and marine environment in this area that are beyond the scope of this report. Of particular relevance and overlap with the issues identified in this report are:

- Disturbance to seals and cetaceans as Grey Seal, Common Dolphin and Bottle-nosed Dolphin all are relatively frequent and other species could occur, with particular risks around Personal Watercraft, boats and other activities on the open water;
- Disturbance to breeding seabirds as the Berry Head area in particular supports a very notable population of breeding auks;
- Disturbance to bats roosting in caves (Corbridge Cave is a winter hibernaculum for Greater Horseshoe Bats, an interest features of the South Hams SAC).

Current measures in place to address risks

4.31 Concerns regarding the impacts of recreation to the caves or the seagrass beds are not new and a number of measures are in place to protect them.

4.32 Many of the key areas with caves are managed by the Torbay Coast and Countryside Trust. Natural England's site improvement plan[19] highlights that the Torbay Coast and Countryside Trust (TCCT) works with local coasteering, diving and watersports companies, making them aware of the delicate nature of the sea cave fauna. While this was the case historically, at the time of writing TCCT's work is purely land based due to a lack of capacity/funding.

4.33 Corbridge Cave is gated and access restricted, although this has not always been effective and vandalism has occurred in the past (Procter, 2009). Procter also refers to the Berry Head Quarry Caves access plan which includes restricted access to select locations and at set times of year for certain groups.

[19] http://publications.naturalengland.org.uk/publication/5932217985400832 accessed 23rd March 2022

4.34 A code of conduct relating to the caves has been produced by Chris Proctor but is no longer promoted or available on line.

4.35 Berry Head NNR operates a honesty catch system for anglers, and no individual is permitted to catch more than 20 mackerel within any 24 hour period. Leaflets and guidance information for anglers requests that fires, stove or BBQs are not used, litter is removed and no camping is permitted. Information regarding the seagrass beds is widely available. There are beach information signs and factsheets/maps are available on-line[20] and from the local Harbour Officers. These highlight the locations of the seagrass beds and provide information relating to no anchor zones and speed limits. The Community Seagrass Project, run by the Wild Planet Trust[21] has installed seagrass friendly mooring points in Fishcombe Bay.

4.36 The Torbay Harbours Act covers the whole of the Bay and means the Harbour Masters have jurisdiction over the Bay area. Commercial activity and providers are licenced (licences are renewed annually) and licencing can include specific conditions as necessary.

4.37 The Tor Bay Authority Maritime Guide[22] provides information for various users with respect to safety and raises awareness of nature conservation issues.

[20] https://www.tor-bay-harbour.co.uk/environment/seagrass/ accessed 10th March 2022
[21] https://www.wildplanettrust.org.uk/wild-conservation/tor-bay/ accessed 10th March 2022
[22] See https://www.tor-bay-harbour.co.uk/media/1080/harbour-guide.pdf accessed 10th March 2022

5. Conclusions and recommendations

5.1 The Local Plan Update will mean an increase in local housing and may include tourism related policies. One of the key reasons people are likely to move to the area or visit is the draw of the coast. The Local Plan Update will require Habitats Regulations Assessment (HRA) and it may be difficult for this to rule out adverse effects on integrity from increased recreation use and the sea caves or reefs, with the sea caves particularly vulnerable.

5.2 These caves are unique with the UK and contain very sensitive fauna that are potentially highly vulnerable to damage. Risks for the caves relate to damage from people accessing for wild swimming, kayaks, paddleboards, personal watercraft, diving, coasteering and people accessing the shoreline on foot at low tide. While these are potentially relatively niche activities and many caves are well hidden or difficult to access, risks cannot be ruled out. Our review of social media and websites highlights that the caves are perhaps becoming better known and more promoted. While perhaps of less concern, there are also risks to the SAC from boat anchoring and the reefs.

5.3 The seagrass beds are not a qualifying feature of the SAC but are a feature of the MCZ. Risks relate primarily to damage from anchors, also from people on foot (Torre Abbey area) and from propellers and wash from boats in the shallower water areas. Various initiatives are in place to protect the seagrass beds and the maps of sensitive areas are widely promoted. There are a limited number of eco-buoys (that allow boats to moor without damaging anchors) in place at only one of the seagrass beds (Fishcombe Cove) and risks for this habitat from increased pressure are therefore relevant to the Local Plan.

5.4 We recommend a series of measures that will provide increased protection and ensure that adverse effects on integrity on the Lyme and Torbay SAC, alone or in-combination, as a result of recreation increases associated with the Torbay Local Plan Update can be ruled out.

Recommendations

SAC interest: sea caves and reefs

5.5 We recommend the following relating to sea caves:

1. The only caves at risk are those accessible from the shore or by boat and that don't require specialist equipment or experience to

access. An initial step will be to ensure these caves are clearly Identified. All caves should therefore be categorised for accessibility such that it is possible to identify which ones are actually vulnerable to access by people on foot, those in kayaks, wild swimmers etc. This will inform all subsequent steps.

2. The list of caves identified as accessible in step 1 should be reviewed by marine biologists who understand the cave systems and have undertaken survey work in them, to then further shortlist those where there are sensitive species or where damage is possible. This could include (as available) a review of historic data to check where damage may have already occurred.
3. A monitoring protocol should be established to pick up whether use changes markedly at the key locations identified in step 2. How such monitoring might work would entirely be dependent on the outcomes of steps 1 and 2. Ideally the coverage would be on different tide states, weather conditions, times of day and include weekends and weekdays and be sufficient to show if use changes or risks are evident. Such monitoring might be possible through systematic recording by the Harbour patrol boat when it is out, logging the type of activity, the provider (if an organised group) and the particular location any activitiy is observed along relevant stretches of coast and at cave entrances. If monitoring by the patrol boat is too erratic or doesn't provide sufficient coverage to provide a means of checking levels of access and use of vulnerable caves, further monitoring/an alternative should be instigated. This would either require dedicated boat trips or if relevant areas are visible from the shore, checks from the shore. These could be direct observation or the use of trail cameras (e.g. on time lapse). The aim of the monitoring would be to enable any issues such as certain caves being used by recreation providers, to be quickly picked up and stopped.
4. As appropriate (based on step 2), areas should be clearly mapped where different activities (coasteering, kayaks, wild swimmers etc) are expected to keep away from the cave entrances (these could be voluntary 'zones' where users are simply told to keep away from the shore, rather than specifically highlighting individual cave entrances). T
5. he zones should be used in codes of conduct, signage, relevant websites etc. Such engagement should also encompass the nature conservation importance of the coast and need for responsible access, for example covering litter, harvesting etc.
6. There may be scope to put marker buoys out near specific cave entrances to indicate no access for kayaks, swimmers, paddleboards etc.

7. Licencing for commercial providers should specify that caves should not be visited and licencing should be dependent on respecting the zones set out in the codes of conduct. Licences are issued by the harbour authority on an annual basis so there is a straight forward mechanism to restrict use if commercial providers do not comply with guidance.
8. Should there be concerns from the monitoring data that commercial activities/organised groups are accessing the caves the relevant providers should be contacted, licences revoked as appropriate and necessary enforcement established. It may be appropriate to join groups to act as an observer where uncertainty remains.
9. Signage (and promotion of codes of conduct) should be instigated at the kayak storage racks in each harbour and at key launching points and parking areas where people disembark with SUPs/kayaks.
10. Cave entrances accessible from the shore where there are risks from recreation should be securely locked.

5.6 We recommend the following in relation to the reefs:

11. Areas where anchoring poses a risk to the reef interest should be identified and clearly mapped involving marine biologists with an understanding of the local area and importance of the reefs.
12. The maps from recommendation 10 should be used to establish no anchoring zones which are promoted to recreational boat users through leaflets, signage, buoys and direct contact through marinas.
13. Monitoring (see recommendation 3) should extend to the no anchor zones and monitoring data used to review the effectiveness of the zones. Increased promotion may be required in line with monitoring results.

5.7 The measures above provide a package that will ensure organised/commercial activities and casual use by local residents/visitors is suitably monitored and any impacts associated with Plan-led growth or particular policies in the Local Plan Update can be addressed. Periodic reviews of monitoring data and measures in place may be necessary.

5.8 For mitigation to be taken into account in the appropriate stages of an HRA, all measures must be effective, reliable, timely, guaranteed to be delivered and as long-term as they need to be to achieve their objectives. As such it will be necessary to ensure the relevant steps set out above are further

developed and secured with timing appropriate to when the development in the Plan will come forward.

5.9 In order to ensure the necessary certainty of delivery and ensure funding, mitigation could be established strategically. A strategic approach would allow individual development to contribute towards the package of measures outlined above. The measures outlined above are not necessarily very expensive, but will require financial resources, staff time and strategic coordination. Such mitigation is unlikely to be effective if delivered in a piecemeal fashion by individual developments. The next step would therefore involve the production of a mitigation strategy that identifies measures and sets out the costs and how they will be implemented. This will need to identify what kinds of development should contribute to the strategy and how contributions would be collected. The production of the strategy should include input from relevant stakeholders and advice from Natural England.

5.10 All development that results in increased housing or tourism will require Habitats Regulations Assessment. With strategic mitigation in place, it should be relatively straight-forward to rule out adverse effects on integrity for most developments. Any individual planning applications that have a very clear or strong link to increased recreational use of the coast may require additional measures and these will need to be subject to project level HRA. Any projects relating to expansion or new facilities for kayaks, paddleboarding, wild swimming, personal watercraft, coasteering or other activities, or tourist accommodation directly linked to these activities will need particular consideration.

5.11 In the absence of any strategic mitigation package, it will be necessary for the Council to undertake HRA on a case-by-case basis and it may be difficult to secure necessary mitigation, particularly for small residential developments. An interim approach may be necessary.

Seagrass beds

5.12 With respect to the seagrass beds, boat users are currently asked to refrain from anchoring in the seagrass areas but there is no means to enforce this. Any risks of further impacts to the seagrass from recreation can be addressed with the following steps:

- Provision and promotion of additional eco-moorings to ensure adequate provision across all relevant seagrass beds;

- Continued promotion of the seagrass beds and no anchoring requirements;
- Monitoring of anchoring in the seagrass beds to determine frequency of occurrence, potentially through with the patrol boat and/or from shore;
- Should issues remain, potential for creation of no-anchor zones that are enforceable.

References

Addessi, L. (1994). Human disturbance and long-term changes on a rocky intertidal community. *Ecological Applications*, *4*, 786–797.

Amelung, B., Nicholls, S., & Viner, D. (2007). Implications of Global Climate Change for Tourism Flows and Seasonality. *Journal of Travel Research*, *45*(3), 285–296. https://doi.org/10.1177/0047287506295937

Broad, A., Rees, M. J., & Davis, A. R. (2020). Anchor and chain scour as disturbance agents in benthic environments: Trends in the literature and charting a course to more sustainable boating and shipping. *Marine Pollution Bulletin*, *161*, 111683. https://doi.org/10.1016/j.marpolbul.2020.111683

Ceccherelli, G., Campo, D., & Milazzo, M. (2007). Short-term response of the slow growing seagrass Posidonia oceanica to simulated anchor impact. *Marine Environmental Research*, *63*(4), 341–349. https://doi.org/10.1016/j.marenvres.2006.10.004

Collins, K. J., Suonpaa, A. M., & Mallinson, J. J. (2010). The impacts of anchoring and mooring in seagrass, Studland Bay, Dorset, UK. *Underwater Technology: The International Journal of the Society for Underwater*, *29*(3), 117–123.

Curtin, S. (2019). *Bait digging and hand gathering in the Torbay Marine Conservation Zone*.

Day, B. H. (2020). The Value of Greenspace Under Pandemic Lockdown. *Environmental and Resource Economics*, *76*(4), 1161–1185. https://doi.org/10.1007/s10640-020-00489-y

Field, M. (2020). *Torbay MCZ Seagrass Baseline Monitoring 2019*. Report by Ecospan Environmental Ltd for Natural England.

Kleinschroth, F., & Kowarik, I. (2020). COVID-19 crisis demonstrates the urgent need for urban greenspaces. *Frontiers in Ecology and the Environment*, *18*(6), 318–319. https://doi.org/10.1002/fee.2230

Liley, D., Morris, R. K. A., Cruickshanks, K., Macleod, C., Underhill-Day, J., Brereton, T., & Mitchell, J. (2012). *Identifying best practice in management of activities on Marine Protected Areas.* (Footprint Ecology/Bright Angel Consultants/MARINElife Number 108; Natural England Commissioned Reports).

Mackintosh, C., Griggs, G., & Tate, R. (2018). Understanding the growth in outdoor recreation participation: An opportunity for sport development in the United Kingdom. *Managing Sport and Leisure*, *23*(4–6), 315–335. https://doi.org/10.1080/23750472.2019.1595093

Mendez, M. M., Livore, J. P., & Bigatti, G. (2019). Interaction of natural and anthropogenic stressors on rocky shores: Community resistance to trampling. *Marine Ecology Progress Series*, *631*, 117–126. https://doi.org/10.3354/meps13144

Milazzo, M., Chemello, R., Badalamenti, F., Camarda, R., & Riggio, S. (2002). The Impact of Human Recreational Activities in Marine Protected Areas: What Lessons Should Be Learnt in the Mediterranean Sea? *Marine Ecology*, *23*(2), 280–290. https://doi.org/10.1111/j.1439-0485.2002.tb00026.x

Milazzo, M., Chemello, R., Badalamenti, F., & Riggio, S. (2002). Short-term effect of human trampling on the upper infralittoral macroalgae of Ustica Island MPA (western Mediterranean, Italy). *Journal of the Marine Biological Association of the UK*, *82*, 745–748.

Monz, C. A., Pickering, C. M., & Hadwen, W. L. (2013). Recent advances in recreation ecology and the implications of different relationships between recreation use and ecological impacts. *Frontiers in Ecology and the Environment*, *11*(8), 441–446. https://doi.org/10.1890/120358

Natural England, & Marine Management Organisation. (2017). *Marine recreation evidence briefing: Coasteering*. Natural England and the Marine Management Organisation.

O'Neill, R. (2019). *Monitor of Engagement with the Natural Environment – The national survey on people and the natural environment. Headline report 2019* (NECR No. 275). Natural England and the Office for National Statistics. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/828552/Monitor_Engagement_Natural_Environment_2018_2019_v2.pdf

Procter, C. J. (2009). *The coastal caves of Torbay*. Report to Torbay Coast and Countryside Trust and Natural England.

Rogers, A. (2010). *Scoping Study into the Potential Impacts of Coasteering in Pembrokeshire. Interim Report*. National Trust.

Rogers, A. (2011). *Investigation into the Perceptions of Coasteering in Pembrokeshire National Park Amongst Participants in Other Forms of Recreation* [Masters]. Sheffield Hallam University, Sheffield Hallam University. School of Leisure and Food Management.

Saunders, C., Selwyn, J., Richardson, S., May, V., & Heeps, C. (2000). *A review of the effects of recreational interactions within UK European marine sites*. UK CEED & Bournemouth University.

file:///S:/reports%20%26%20pdfs/Papers%20linked%20to%20Endnote/CEED%20recreation%20marine%20sites.pdf

Stevčić, Č., Pérez-Miguel, M., Drake, P., Tovar-Sánchez, A., & Cuesta, J. A. (2018). Macroinvertebrate communities on rocky shores: Impact due to human visitors. *Estuarine, Coastal and Shelf Science*, *211*, 127–136. https://doi.org/10.1016/j.ecss.2017.11.026

Torbay Council. (2017). *English Riviera Destination Management Plan 2017-2021 Evidence Base*. https://www.torbay.gov.uk/DemocraticServices/documents/s43523/English%20Riviera%20Destination%20Management%20Plan%202017-2021%20App3.pdf

Travaille, K. L., Salinas-de-León, P., & Bell, J. J. (2015). Indication of visitor trampling impacts on intertidal seagrass beds in a New Zealand marine reserve. *Ocean & Coastal Management*, *114*, 145–150. https://doi.org/10.1016/j.ocecoaman.2015.06.002

Tyler-Walters, H. (2005). *Assessment of the Potential Impacts of Coasteering on Rocky Intertidal Habitats in Wales*. Report to Cyngor Cefn Gwlad Cymru / Countryside Council for Wales from the Marine Life Information Network (MarLIN). [CCW Contract no. NWR012]. http://www.marlin.ac.uk/PDF/Coasteering_Rpt05_screen.pdf

Unsworth, R. K. F., Williams, B., Jones, B. L., & Cullen-Unsworth, L. C. (2017). Rocking the Boat: Damage to Eelgrass by Swinging Boat Moorings. *Frontiers in Plant Science*, *8*. https://doi.org/10.3389/fpls.2017.01309

Watson, G. J., Murray, J. M., Schaefer, M., Bonner, A., & Gillingham, M. (2017). Assessing the impacts of bait collection on inter-tidal sediment and the associated macrofaunal and bird communities: The importance of appropriate spatial scales. *Marine Environmental Research*, *130*, 122–133. https://doi.org/10.1016/j.marenvres.2017.07.006