Marine Conservation Zone Assessment

Site name: Erme Estuary MCZ
UKMCZ0059

Protected feature(s):
Intertidal coarse sediment
Intertidal mixed sediment
Sheltered muddy gravels
Tentacled lagoon worm (*Alkmaria romijni*)

Fishing activities assessed at this site:
Stage 1 Assessment
Seine nets & other: Beach seine

Devon & Severn IFCA
Inshore Fisheries and Conservation Authority

D&S IFCA Reference
ERM-MCZ-006

Contents

Version control history			
Author	**Date**	**Comment**	**Version**
Sarah Curtin	October 2021	Draft assessment	0.1
	February 2022	Updated using other estuarine MCZ advice packages with similar habitat	0.2
	November 2022 / January 2023	Finalised assessment (J. Stewart) and review (S. Clark)	1.0

1. Introduction

This assessment has been undertaken by Devon & Severn Inshore Fisheries and Conservation Authority (D&S IFCA) in order to document and determine whether management measures are required to achieve the conservation objectives of marine conservation zones (MCZs). The IFCA's responsibilities in relation to management of MCZs are laid out in Sections 124 to 126, & 154 to 157 of the Marine and Coastal Access Act 2009.

2. MCZ site name(s), and location

The Erme Estuary MCZ is an inshore site of approximately 1km^2 in size. The Erme is located in South Devon and opens into the Western Channel and Celtic Sea region. The MCZ designation covers the whole estuary from the mouth of the river to the limits of the tidal influence near the village of Ermington. The MCZ falls within the Erme Estuary Site of Special Scientific Interest as well as overlapping with the Prawle Point to Plymouth Sound and Eddystone Site of Community Importance at the mouth of the river.

The wide variety of habitats found within the Erme Estuary support a large number of important species including several that are rare, such as the tentacled lagoon worm, *Alkmaria romijni*. This tiny bristleworm grows up to 5mm in length and creates and lives in tubes within the mud habitats of the estuary. These worms have tentacles around their mouths used for gathering food from the surrounding muddy sediments. The tentacled lagoon worm is particularly vulnerable to activities that cause changes in its habitat.

Estuaries create important areas for wading and migratory birds to feed and rest and form nurseries for juvenile species of fish. The large areas of mudflats and muddy gravel produce films of algae which become exposed at low tide, making them important foraging grounds for several species. The estuarine rocky habitats provide a hard surface for algae and animals to attach in an area dominated by sand and mud with variable salinity. At low tide these areas become foraging grounds for birds and crustaceans and at high tide they create shelter for juvenile species of fish.

At the mouth of the river exposed rocks provide a hard surface for mussels, limpets and barnacles to attach to in areas dominated by sediment and muddy gravel (Defra, 2019).

Further information regarding the MCZ and its protected features can be found in the Erme Estuary MCZ Factsheet.

3. Feature(s) / habitat(s) of conservation importance (FOCI/HOCI) and conservation objectives

Table 1 - Protected features relevant to this assessment

Feature	General management approach
Intertidal coarse sediment	Recover to favourable condition
Intertidal mixed sediment	Maintain in favourable condition
Sheltered muddy gravels	Maintain in favourable condition
Tentacle lagoon worm (*Alkmaria romijni*)	Maintain in favourable condition

The conservation objectives for these features are that they are brought to, and remain in, favourable condition.

4. Gear/feature interaction in the MCZ categorised as 'red' risk and overview of management measure

None - There are no gear/feature interactions in the MCZ that are categorised as 'red' risk.

5. Activities under consideration

- Seine nets & other: Beach seine

Seine netting is permitted under the Netting Permit Byelaw permit conditions but has restrictions relating to length of net, limited catch for sandeels only, mesh size and deployment of the nets. However, there are no records of this currently occurring. See Curtin (2022) for more information regarding fishing activities occurring in the Erme Estuary MCZ.

6. Is there a risk that activities are hindering the conservation objectives of the MCZ?

Yes,
Evidence:
To determine whether each pressure is capable of affecting (other than insignificantly) the site's feature(s), the sensitivity assessments and risk profiling of pressures from the advice on operations section of the Natural England conservation advice package were used (Natural England, 2021). Table 22 shows the fishing activities and pressures included for assessment. The justifications for the pressures chosen for inclusion in this assessment can be seen Annex 2.

Table 2 - Fishing activities and pressures included in this assessment.

Activity	Pressures
Seine nets and other: Beach seine/ring	Abrasion/disturbance of the substrate on the surface of the seabed Changes in suspended solids (Water clarity) Penetration and/or disturbance of the substratum below the surface of the seabed including abrasion Removal of non-target species Smothering and siltation rate changes (Light)

It should be noted that no conservation advice package is currently available (November 2022) for the Erme Estuary MCZ. Therefore, relevant advice on operations and supplementary advice tables for other sites with similar features were used (Table 3), alongside considering site specific information.

Table 3 - Relevant favourable condition targets for identified pressures.

Feature	Conservation advice package used
Intertidal coarse sediment	Axe Estuary MCZ
Intertidal mixed sediment	
Sheltered muddy gravels	No alternative CA package found, intertidal mud used as proxy
Tentacle lagoon worm (*Alkmaria romijni*)	Dart Estuary MCZ

Section 8 provides detail on the activity and literature review to support this assessment.

7. Can D&S IFCA exercise its functions to further the conservation objectives of the site?

Yes,
Evidence: Monitoring and Control Arrangements

- Enforcement of current byelaws
- Monitoring and review of current byelaws
- Monitoring of fishing activity in the Estuary
- Changes can be made to the permit conditions, via consultation, if the D&S IFCA deems it to be necessary. This could include limitations or spatial/temporal restrictions. The permitting system allows for adaptive management.

8. Referenced supporting information to inform assessment

Abrasion, removal of target and non-target species

The effects of fishing on a benthic community will depend on the type of gear used, the nature of the substratum and the sensitivity of individual species concerned (Lamberth *et al.*, 1995). Beach seine nets may interact with the features considered when the net is drawn ashore. Possible direct effects of a net being dragged over the seafloor include damage to sedentary organisms or entrapment, and removal of non-target species. Indirect effects include alteration of substratum, and sediment resuspension which could result in smothering (Caddy, 1973; de Groot, 1979).

Lamberth *et al.* (1995) looked at the impact of beach seine netting on the benthic flora and fauna of False Bay (South Africa). They found no difference in the abundance or species composition between sites inside and outside the seine area. Macrophyte and invertebrate bycatches were infrequent as fishers try to avoid such catches due to reduced capture efficiency of target species. They therefore concluded that beach seine netting does not have a detrimental effect on the benthic flora and invertebrate fauna in False Bay.

Beach seine fishermen generally avoid netting in areas where there is rocky habitat and large quantities of suspended macrophyte as this can cause bottom snags and slow down the speed of the haul. Snagging can result in seine rolling reducing capture efficiency (Pierce *et al.*, 1990).

Beach seine nets are usually worked clear of the seabed or with very light contact, therefore any impacts of abrasion are thought to be minimal (Seafish, 2020). Due to the small quantities of substrate that would be disturbed, it is therefore not expected that the features will be affected (other than insignificantly).

9. In-combination assessment

Table 4 - Relevant activities occurring in or close to the site

Plans and Projects		
Activity	**Description**	**Potential Pressure(s)**
No other plans or projects known to be occurring within Erme Estuary MCZ	The impact of future plans or projects will require assessment in their own right, including accounting for any in-combination effects, alongside existing activities.	N/A
Other activities being considered		
Activity	**Description**	**Potential Pressure(s)**
Crab tiling	There is no evidence that this activity is currently occurring. As the activities assessed (section 5) are not believed to be occurring, it	Abrasion/disturbance of the substrate on the surface of the seabed

	is thought there is no in-combination effect	Habitat structure changes – removal of substratum (extraction) Removal of target species Removal of non-target species Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion Smothering and siltation rate changes (Light) Genetic modification & translocation of indigenous species Introduction of microbial pathogens Introduction or spread of invasive non-indigenous species (NIS)
Bait digging	Activity is occurring but at low levels and in limited locations. Additionally, as the activities assessed (section 5) are not believed to be occurring, it is thought there is no in-combination effect.	
Hand working (access from land/access from vessel)	Activity is occurring but a very low levels, additionally as the activities assessed (section 5) are not believed to be occurring, it is thought there is no in-combination effect.	
Static – pots/traps: Pots/creels, cuttlepots, fish traps	As there is little to no level of this activity in the Erme Estuary MCZ, no in-combination effect thought to be possible.	
Static – fixed nets: Gill nets, Trammels, Entangling	This activity is currently not permitted to take place within the Erme Estuary MCZ as it falls under the D&S IFCA Netting Permit Byelaw. In the estuary landward of the coordinates set out in Annex 1, Figure 4, a permit holder or named representative is not authorised to use any net other than a seine net. Therefore no in-combination effect is thought to be possible.	
Passive – nets: Drift nets (demersal)	This activity is currently not permitted to take place within the Erme Estuary MCZ as it falls under the D&S IFCA Netting Permit Byelaw. In the estuary landward of the coordinates set out in Annex 1, Figure 4, a permit holder or named representative is not authorised to use any net other than a seine net. Therefore no in-combination effect is thought to be possible.	
Seine nets and other; Shrimp push nets, fyke and stakenets, ring nets	This activity is currently not permitted to take place within the Erme Estuary MCZ as it falls under the D&S IFCA Netting Permit Byelaw. In the estuary landward of the coordinates set out in Annex 1, Figure 3, a permit holder or named representative is not authorised to use any net other than a seine net. Therefore no in-combination effect is thought to be possible..	
Lines: Longlines (demersal)	As there is little to no level of this activity in the Erme Estuary MCZ, no in-combination effect thought to be possible.	
Aquaculture	There is no evidence that this activity is currently occurring. Additionally, as the activities assessed (section 5) are not belived to be occurring, it is thought there is no in-combination effect.	

D&S IFCA concludes there is no likelihood of significant adverse effect on the interest features from in-combination effects addressed within **Error! Reference source not found.**.

10. NE consultation response

N/A Natural England has not been consulted at this stage.

11. Conclusion

The activities assessed are not believed to be occurring within the MCZ. Therefore, D&S IFCA concludes that there is no significant risk of the activities hindering the achievement of the conservation objectives for Erme Estuary MCZ.

12. Summary table

Feature or habitat of Conservation interest	**Conservation objectives/ Target Attributes** (Natural England, 2021)	**Activity**	**Potential pressures from activity and sensitivity of habitats to pressures.** (Natural England, 2021)	**Potential exposure to pressures and mechanism of impact significance**	**Is there a risk that the activity could hinder the achievement of conservation objectives of the site?**	**Can D&S IFCA exercise its functions to further the conservation objectives of the site?** **If Yes, list management options**
Intertidal coarse sediment	Maintain the presence and spatial distribution of intertidal coarse sediment communities Maintain the total extent and spatial distribution of intertidal coarse sediment (Maintain OR Recover OR Restore) the abundance of listed to enable each of them to be a viable component of the habitat Maintain the species composition of component	Commercial fishing; Seine nets and other: Beach seine/ring nets	• Abrasion/Disturbance of the substrate on the surface of the seabed • Changes in suspended solids (water clarity) • Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion • Removal of non-target species • Removal of target species • Smothering and siltation rate changes (Light) See Annex 2 for pressures audit trail	Beach seine nets may interact with the features considered when the net is drawn ashore. Possible direct effects of a net being dragged over the seafloor include damage to sedentary organisms or entrapment, and removal of non-target species. Indirect effects include alteration of substratum, and sediment resuspension which could result in smothering (Caddy, 1973; de Groot, 1979). Lamberth *et al.* (1995) looked at the impact of	Activities not believed to be occurring D&S IFCA concludes that there is no significant risk of the activities hindering the achievement of the conservation objectives.	Yes, Management measures could include: • Enforcement of current byelaws • Monitoring and review of current byelaws • Monitoring of fishing activity in the Estuary • Changes can be made to the permit conditions, via consultation, if the D&S IFCA deems it to be necessary. This could include limitations or spatial/temporal restrictions. The permitting system allows for adaptive management.

	communities			beach seine netting on the benthic flora and fauna of False Bay. They found no difference in the abundance or species composition between sites inside and outside the seine area. Macrophyte and invertebrate bycatches were infrequent as fishers try to avoid such catches due to reduced capture efficiency		
Intertidal mixed sediment	Maintain the presence and spatial distribution of Intertidal mixed sediment communities Maintain the total extent and spatial distribution of intertidal mixed sediment (Maintain OR Recover OR Restore) the	Commercial fishing; Seine nets and other: Beach seine/ring nets	• Abrasion/Disturbance of the substrate on the surface of the seabed •Changes in suspended solids (water clarity) •Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion •Removal of non-target species •Removal of target species •Smothering and siltation rate changes (Light) See Annex 2 for pressures audit trail	See above	See above	See above

	abundance of listed to enable each of them to be a viable component of the habitat Maintain the species composition of component communities					
Sheltered muddy gravels	Maintain the presence and spatial distribution of sheltered muddy gravel communities Maintain the total extent and spatial distribution of sheltered muddy gravel (Maintain OR Recover OR Restore) the abundance of listed to enable each of them to be a viable component of the habitat Maintain the species	Commercial fishing; Seine nets and other: Beach seine/ring nets	• Abrasion/Disturbance of the substrate on the surface of the seabed • Changes in suspended solids (water clarity) • Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion • Removal of non-target species • Removal of target species • Smothering and siltation rate changes (Light) See Annex 2 for pressures audit trail	See above	See above	See above

	composition of component communities					
Tentacle lagoon worm (*Alkmaria romijni*)	Maintain the population size within the site. Maintain the reproductive and recruitment capability of the species. Maintain connectivity of the habitat within sites and the wider environment to ensure larval dispersal and recruitment, and / or to allow movement of migratory species. Maintain the extent and spatial distribution of the following known supporting habitat: intertidal mud.	Commercial fishing; Seine nets and other: Beach seine/ring nets	• Abrasion/Disturbance of the substrate on the surface of the seabed • Changes in suspended solids (water clarity) • Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion • Removal of non-target species • Removal of target species • Smothering and siltation rate changes (Light) See Annex 2 for pressures audit trail	See above	See above	See above

13. References

Caddy, J. F. 1973. Underwater Observations on Tracks of Dredges and Trawls and Some Effects of Dredging on a Scallop Ground. Journal of the Fisheries Research Board of Canada, 30: 173–180. NRC Research Press.

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Lamberth, S. J., Bennett, B. A., Clark, B. M., and Janssens, P. M. 1995. The impact of beach-seine netting on the benthic flora and fauna of False Bay, South Africa. South African Journal of Marine Science, 15: 115–122.

Natural England (2021) Draft Conservation Advice for Erme Estuary Marine Conservation Zone (MCZ)

Pierce, C., Rasmussen, J., and Leggett, W. 1990. Sampling Littoral Fish with a Seine: Corrections for Variable Capture Efficiency. Canadian Journal of Fisheries and Aquatic Sciences - CAN J FISHERIES AQUAT SCI, 47: 1004–1010.

Seafish. 2022. Beach Seine. https://www.seafish.org/responsible-sourcing/fishing-gear-database/gear/beach-seine/ (Accessed 18 August 2020).

Annex 1: Site Map(s)

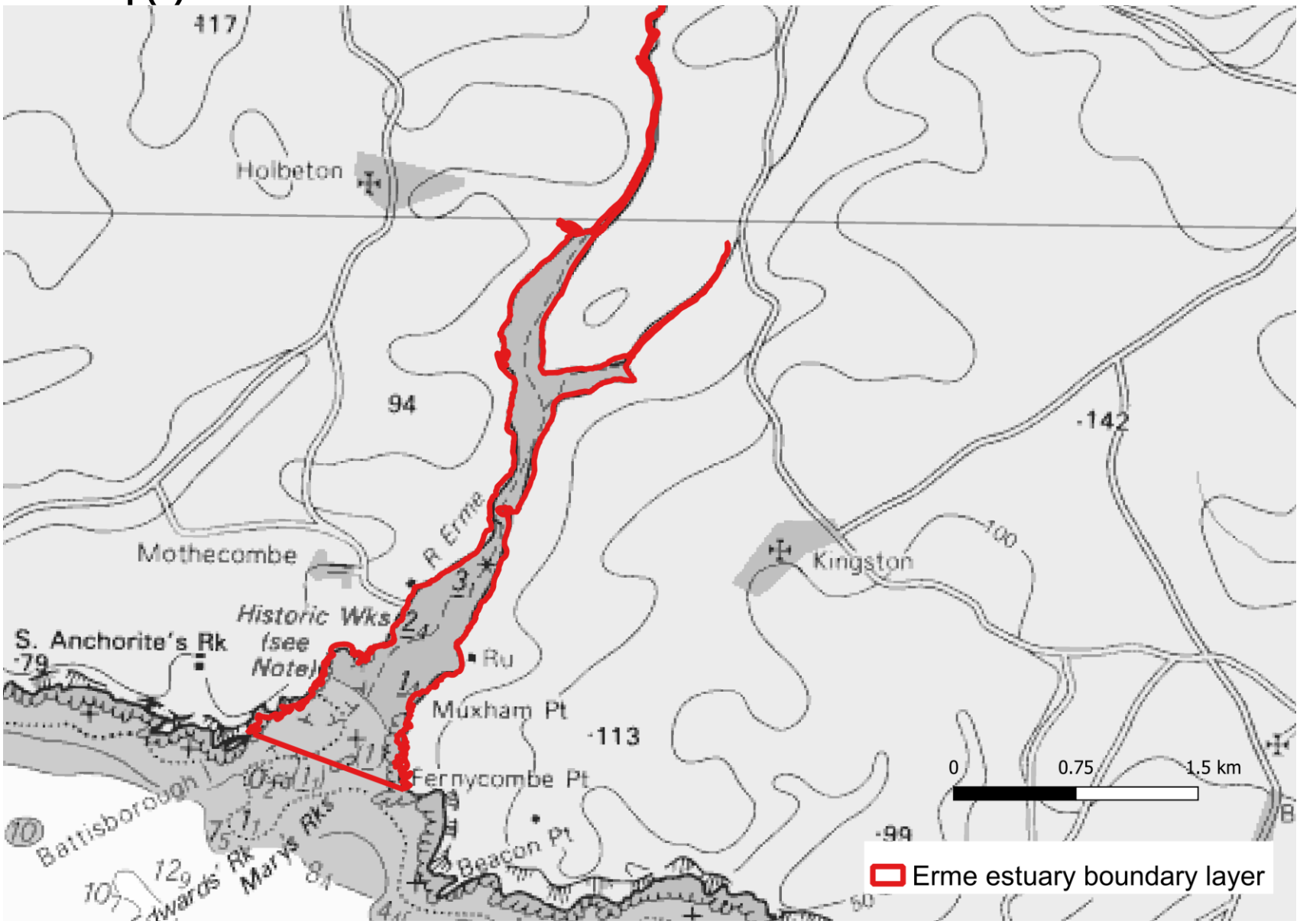


Figure 1 – Erme Estuary MCZ

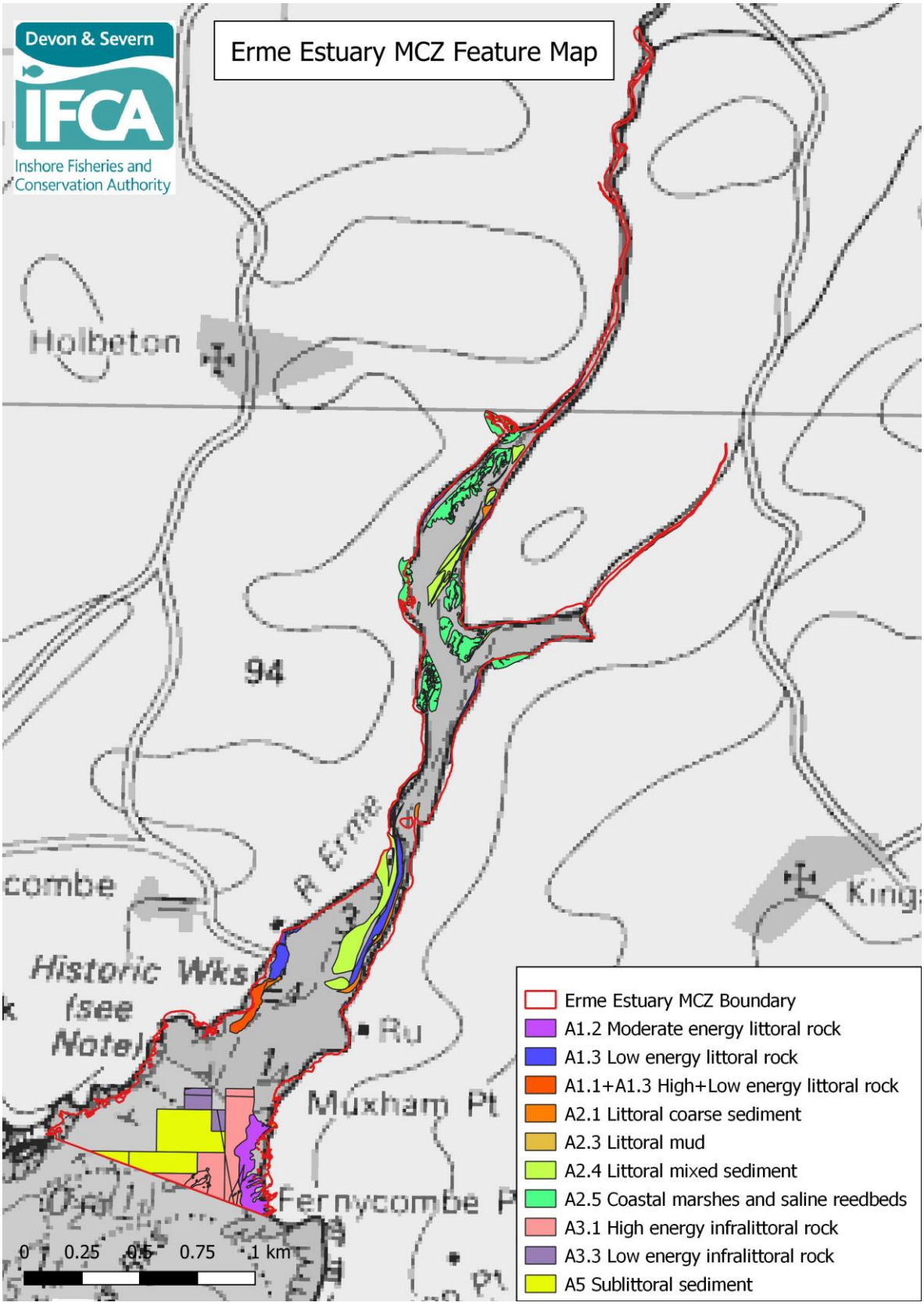
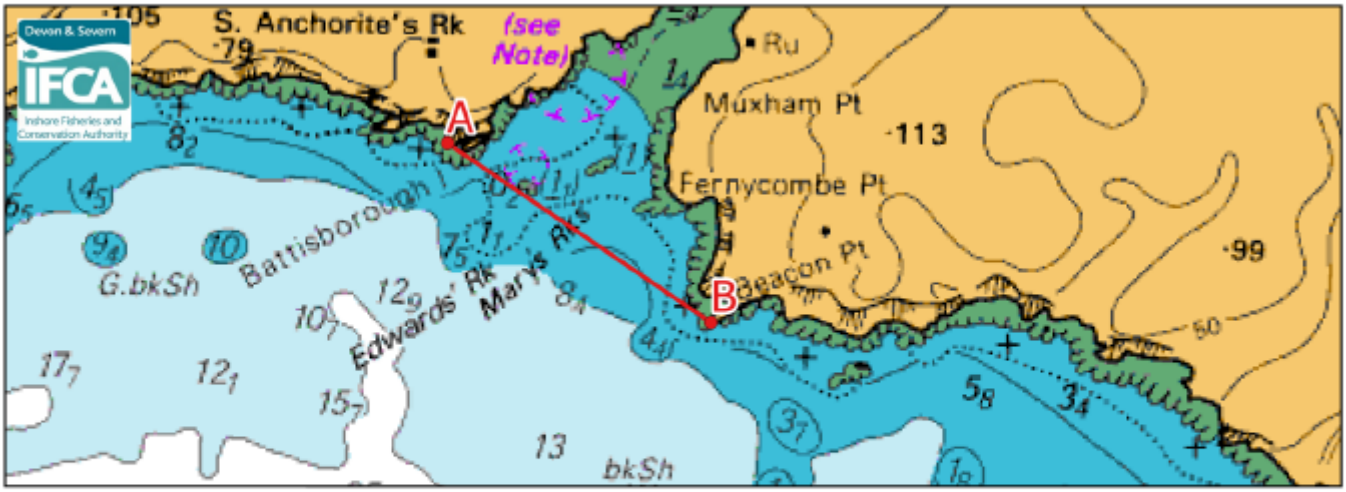


Figure 2: Extent of features designated in the Erme Estuary MCZ

Annex 2 Chart of River Erme closing line - No access to the use of nets other than a seine net in accordance with paragraph 3.2 of the Netting Permit Conditions



Estuary closing line

River Erme closing line latitude and longitude positions:

Point	Latitude	Longitude
A (Battisborough Island)	50° 18.243'N	003° 57.834'W
B (Beacon Point)	50° 17.750'N	003° 56.657'W

Figure 3: River Erme closing line latitude and longitude, from Annex 2 to the Netting Permit Byelaw. No access landward of the line to the use of nets other than a seine net in accordance with paragraph 3.2 of the Netting Permit Conditions.

Annex 2: Pressures Audit Trail

Fishing Activity Pressures: Demersal seines	**Intertidal coarse sediment**	**Intertidal mixed sediment**	**Sheltered muddy gravels**	**Tentacled lagoon worm (*Alkmaria romijini*)**	**Screening Justification**
Abrasion/disturbance of the substrate on the surface of the seabed	NS	S	S		IN - Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Changes in suspended solids (water clarity)	NS	S	S		IN - Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	NS	S	S		IN - Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Removal of non-target species		S	S		IN - Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Smothering and siltation rate changes (Light)	NS	S	S		IN - Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Deoxygenation	NS	S	NS		OUT – Insufficient activity levels to pose risk at level of concern
Hydrocarbon & PAH contamination	NA	NA	NA		OUT – Not applicable
Introduction of light		IE	NS		OUT – Insufficient activity levels to pose risk at level of concern
Introduction or spread of invasive non-indigenous species (INIS)		S	S		OUT – Insufficient activity levels to pose risk at level of concern
Litter	NA	NA	NA		OUT – Not applicable
Nutrient enrichment	NS	NS	NS		OUT – Not applicable
Organic enrichment	NS	NS	NS		OUT – Insufficient activity levels to pose risk at level of concern
Physical change (to another seabed type)					OUT – Insufficient activity levels to pose risk at level of concern
Physical change (to another sediment type)	S	S	S		OUT – Not applicable
Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)	NA	NA	NA		OUT – Not applicable
Transition elements & organo-metal (e.g. TBT) contamination	NA	NA	NA		OUT – Not applicable