Marine Conservation Zone Assessment

Site name:	Devon Avon Estuary MCZ UKMCZ0058
Protected feature(s):	Intertidal mud Intertidal sand and muddy sand Moderate energy intertidal rock Tentacled lagoon work (*Alkmaria romijni*)

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

Devon & Severn IFCA
Inshore Fisheries and Conservation Authority

D&S IFCA Reference
DAV-MCZ-002

Contents

Version control history			
Author	**Date**	**Comment**	**Version**
Lauren Henly	10/2021	First draft	0.1
Lauren Henly	23/02/2022	Additional content from call for information	0.2
	01/07/2022	Reviewed and updated by J Stewart	0.3
Lauren Henly	06/07/2022	Comments addressed	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 Devon Avon Estuary MCZ is an inshore site located on the coast of south Devon in the south west of England. The site covers an area of 2 km^2 and extends from the mouth of the estuary up to a tidal weir at Aveton Gifford. This site protects a wide range of habitats and species, including a number of rare species. Estuaries are important contributors to a healthy environment and have an important role as a nursery ground for juvenile fish and is potentially important for seahorse populations as it provides suitable food and shelter. Various species of worm, crustacean and shrimp can be found here, including the nationally scarce tentacled lagoon worm *Alkmaria romijni*. This is a tiny bristleworm which grows up to 5 mm in length. It 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.

The saltmarshes provide habitat for crustaceans (such as crabs, lobsters and barnacles), molluscs (such as mussels and oysters) and a nursery area for fish, as well as feeding grounds for birds.

Further information regarding the MCZ and its protected features can be found in the Devon Avon Estuary MCZ Factsheet (Defra, 2019).

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 mud	Maintain in favourable condition
Intertidal sand and muddy sand	Maintain in favourable condition
Moderate energy intertidal rock	Maintain in favourable condition
Tentacled lagoon worm (*Alkmaria romijni*)	Maintain in favourable condition

The conservation objectives for these features are that they 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/ring

See Henly (2021) for more information regarding fishing activities occurring in the Devon Avon 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 2 shows the fishing activities and pressures included for assessment. The justifications for the pressures chosen for inclusion in this assessment can be seen in Annex 2.

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

Activity	Pressures
Seine nets & other: Beach seine/ring	Abrasion/disturbance of the substrate on the surface of the seabed
	Habitat structure changes - removal of substratum (extraction)
	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
	Removal of non-target species
	Removal of target species
	Visual disturbance

The relevant targets for favourable condition were identified within Natural England's conservation advice supplementary advice tables (Natural England, 2021). Table 3 shows which targets were identified as relevant to the activity assessed. The impacts of pressures on features were assessed against these targets to determine whether the activities causing the pressures are compatible with the site's conservation objectives.

Table 3 - Relevant favourable condition targets for identified pressures.

Feature	Attribute	Target
Intertidal mud	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal mud communities.
	Extent and distribution	Maintain the total extent and spatial distribution of intertidal mud.
	Structure and function: presence and abundance of key structural and influential species	[Maintain OR Recover OR Restore] the abundance of listed species*, to enable each of them to be a viable component of the habitat.
Intertidal sand and muddy sand	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal sand and muddy sand communities.
	Extent and distribution	Maintain the total extent and spatial distribution of intertidal sand and muddy sand.
	Structure and function: presence and abundance of key structural and influential species	[Maintain OR Recover OR Restore] the abundance of listed species*, to enable each of them to be a viable component of the habitat.
Moderate energy intertidal rock	Distribution: presence and spatial distribution of	Maintain the presence and spatial distribution of intertidal rock communities.

	biological communities	
	Extent and distribution	Maintain the total extent and spatial distribution of intertidal rock subject to natural variation in sediment veneer.
	Structure and function: presence and abundance of key structural and influential species	[Maintain OR Recover OR Restore] the abundance of listed species*, to enable each of them to be a viable component of the habitat.
Tentacled lagoon-worm (Alkmaria romijni)	Population: population size	Maintain the population size within the site.
	Population: recruitment and reproductive capability	Maintain the reproductive and recruitment capability of the species.
	Presence and spatial distribution of the species	Maintain the presence and spatial distribution of the species.
	Structure and function: biological connectivity	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.
	Supporting habitat: extent and distribution	Maintain the extent and spatial distribution of the following known supporting habitat: intertidal mud.

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 further 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). Ring nets are used within the water column and theoretically would not interact with the features considered. 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. 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. 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). Therefore, this in turn has minimal effect on the features assessed.

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).

Local evidence

Seine netting in D&S IFCA's District is managed under D&S IFCA's Netting Permit Byelaw. In 2022, D&S IFCA circulated a request for information to all relevant permit holders, seeking information on their netting activities in or near to the Devon Avon Estuary MCZ. One respondent from the request for information informed of seine netting for sand eels in the estuary. This respondent seine nets once a week from June until November in one location. Under the Netting Permit Byelaw Conditions, the seine net used must measure no longer than 20m in length with a mesh size not exceeding 20mm (and providing that all species caught other than sand eel are returned immediately to the water).

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 Devon Avon 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	Activity has previously occurred, but there has been no evidence of crab tiles on the estuary since 50 were observed in 2003/04. Additionally, as the activities assessed (section 5) are occurring at low levels and limited locations, it is thought there is no in-combination effect.	Abrasion/disturbance of the substrate on the surface of the seabed Habitat structure changes - removal of substratum (extraction) Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion Removal of non-target species Removal of target species.
Bait digging	Activity is occurring, but thought to be only at low levels and in limited locations. Additionally, as the activities assessed (section 5) are occurring at low levels and limited locations, it is thought there is no in-combination effect.	
Hand working (access from land/access from vessel)	There is some evidence of low levels of hand gathering in the estuary. However, as the as the activities assessed (section 5) are occurring at low levels and limited locations, it is thought there is no in-combination effect.	
Static – pots/traps: Pots/creels, cuttlepots, fish traps	There are currently low levels of this activity in the MCZ. Additionally, as the activities assessed (section 5) are occurring at low	

	levels and limited locations, it is thought there is no in-combination effect. The location of the activities assessed are unlikely to overlap with the potting activity in the MCZ.	Visual disturbance
Aquaculture	Activity is occurring in the Devon Avon Estuary MCZ, but as the activities assessed in this assessment are only occurring occasionally and at low levels, no in-combination effect is thought to be possible. This element of the assessment can be revisited following the upcoming review of consents for Pacific oyster mariculture in MCZs, being undertaken by Cefas (Fish Health Inspectorate) and Natural England, if this review process highlights areas of concern and pathways for in-combination impacts.	Abrasion/disturbance of the substrate on the surface of the seabed Changes in suspended solids (water clarity) Introduction of microbial pathogens Introduction or spread of invasive non-indigenous species (INIS) 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) Visual disturbance

D&S IFCA conclude there is no likelihood of significant adverse effect on the interest features from in-combination effects addressed within Table 4.

10. NE consultation response

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

11. Conclusion

Although seine netting is occurring in the MCZ, it is thought to be occurring at low levels and in limited locations. Based on the evidence outlined in section 8, a low level of seine netting is unlikely to result in a significant effect on the condition of the features within the site. Therefore, D&S IFCA conclude that there is no significant risk of the activities hindering the achievement of the conservation objectives for Devon Avon 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 mud	Maintain the presence and spatial distribution of intertidal mud communities. Maintain the total extent and spatial distribution of intertidal mud. [Maintain OR Recover OR Restore] the abundance of listed species*, to enable each of them to be a viable component of the habitat.	Commercial fishing; Seine nets & other: Beach seine/ring	• See Annex 2 for pressures audit trail	Limited exposure One respondent from the request for information informed of seine netting for sand eels in the estuary. This respondent seine nets once a week from June until November in one location.	Based on the current levels of these activities on the Devon Avon Estuary there is not believed to be a significant impact of the shore-based activities on the protected features assessed	Yes, Management measures could include: 1. Monitor activity levels 2. Enforcement of byelaws 3. Monitoring and review of current byelaws 4. Changes can be made to the permit conditions, via consultation, if the D&S IFCA deems it to be necessary. This could include further limitations or spatial/temporal restrictions. The permitting system allows for adaptive management.

Intertidal sand and muddy sand	See above	Commercial fishing; Seine nets & other: Beach seine/ring	• See Annex 2 for pressures audit trail	See above	See above	See above
Moderate energy intertidal rock	See above	Commercial fishing; Seine nets & other: Beach seine/ring	• See Annex 2 for pressures audit trail	See above	See above	See above
Tentacled lagoon-worm (Alkmaria romijni)	Maintain the population size within the site. Maintain the reproductive and recruitment capability of the species. Maintain the presence and spatial distribution of the species. Maintain connectivity of the habitat within sites and the wider environment to ensure larval dispersal and recruitment, and / or to allow	Commercial fishing; Seine nets & other: Beach seine/ring	• See Annex 2 for pressures audit trail	See above	See above	See above

	movement of migratory species. Maintain the extent and spatial distribution of the following known supporting habitat: intertidal mud.					

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.

de Groot, S. J. 1979. An assessment of the potential environmental impact of large-scale sand-dredging for the building of artificial islands in the North Sea. Ocean Management, 5: 211–232.

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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.

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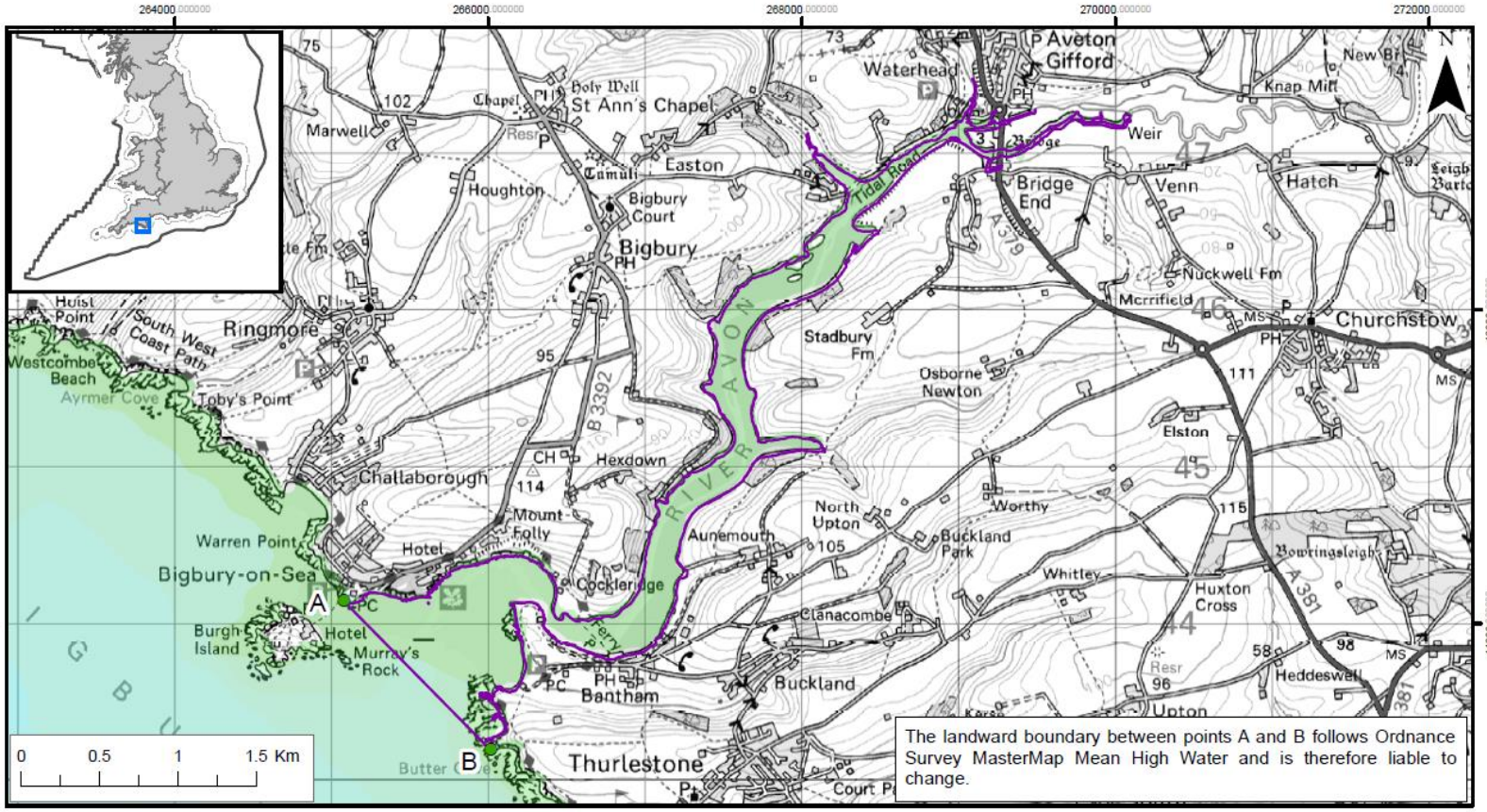
Pierce, C., Rasmussen, J., and Leggett, W. 1990. Sampling Littoral Fish with a Seine: Corrections for Variable Capture Efficiency. Canadian Journal of Fisheries and Aquatic Sciences - CAN J FISHERIES AQUAT SCI, 47: 1004–1010.

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

Annex 1: Site Map(s)



Devon Avon Estuary MCZ Boundary

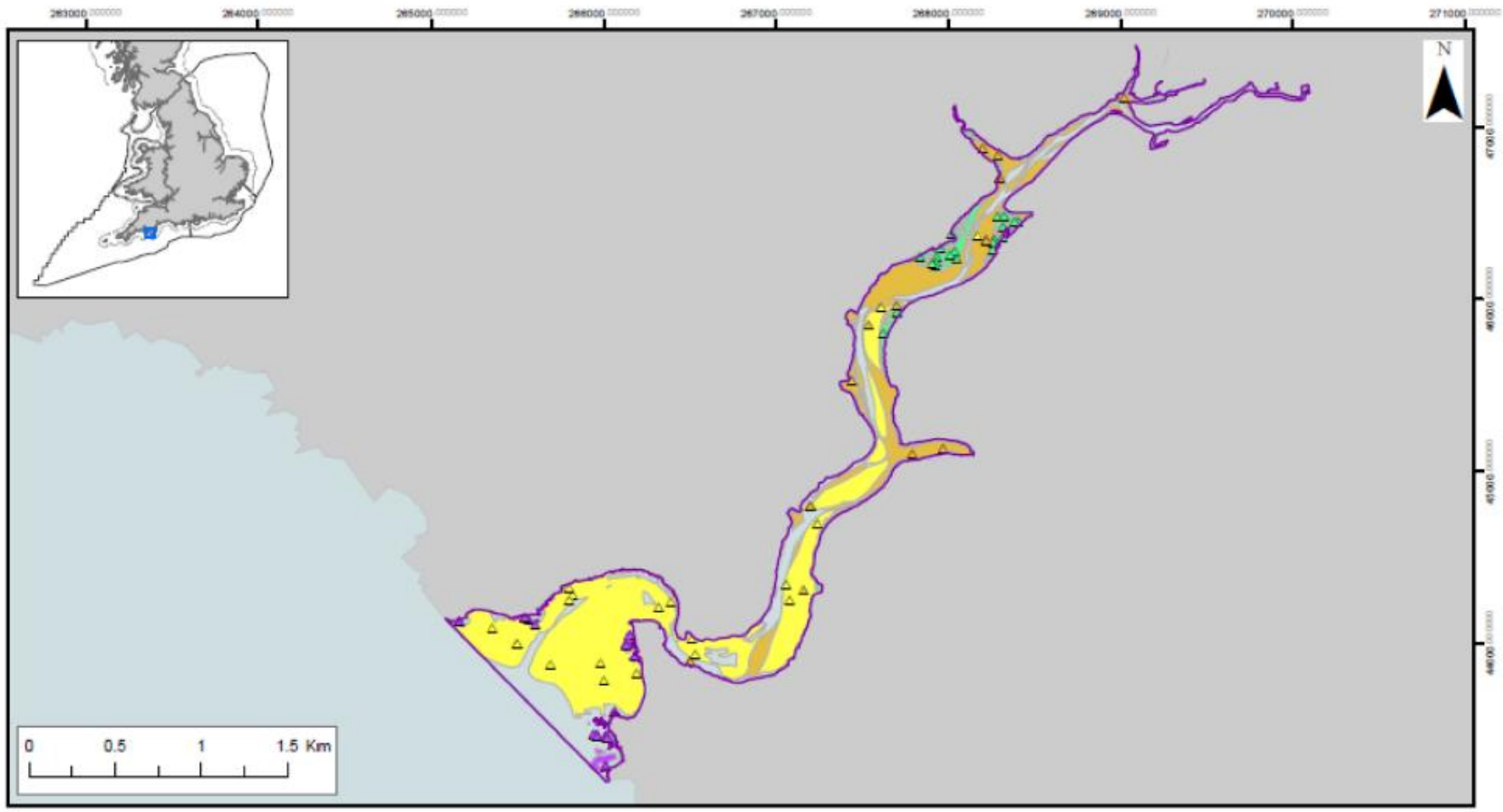
- Marine Conservation Zone
- MCZ boundary co-ordinates
- UK Continental Shelf
- 12nM Territorial Seas Limit
- Land

Point	Lat	Long
A	50° 16' 54.410" N	3° 53' 42.226" W
B	50° 16' 24.493" N	3° 52' 53.862" W

Depth Areas (metres)

-20.0 - -10.0	25.1 - 50.0
-9.9 - -5.0	50.1 - 100.0
-4.9 - 0.0	100.1 - 250.0
0.1 - 5.0	250.1 - 500.0
5.1 - 10.0	500.1 - 1000.0
10.1 - 25.0	

Figure 1 – Devon Avon Estuary MCZ



Devon Avon Estuary MCZ
Broad Scale Habitats

- Marine Conservation Zone
- Regional MCZ Project Area
- 12nM Territorial Seas Limit
- Sea
- Land

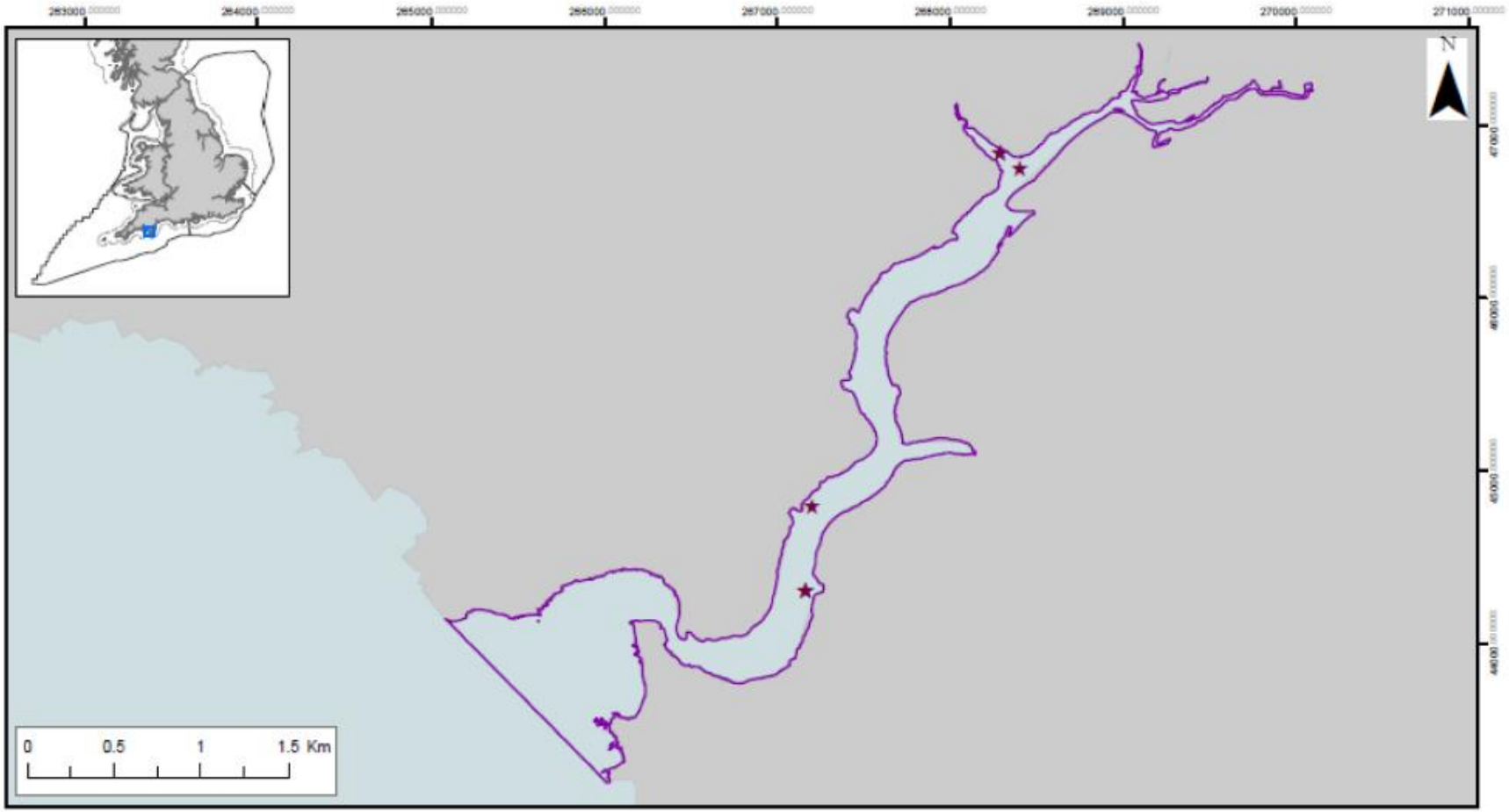
Features designated in 2019

- Moderate energy intertidal rock (A1.2)
- Intertidal sand and muddy sand (A2.2)
- Intertidal mud (A2.3)
- Coastal saltmarshes and saline reedbeds (A2.5)

△ Groundtruthing sampling points, such as diver survey, grab sampling, drop down video, walk over survey or core sampling

Shaded areas represent habitats mapped according to data originating from surveys and mathematical models

Reference: Theme ID: 1477647
Map Projection: British National Grid



Devon Avon Estuary MCZ
Features of Conservation Importance

- Marine Conservation Zone
- Regional MCZ Project Area
- 12nM Territorial Seas Limit
- Sea
- Land

Features designated in 2019

- ★ Tentacled lagoon-worm (*Alkmaria romijni*)

Annex 2: Pressures Audit Trail

Fishing Activity Pressures: Shore-based activities (including seine netting from the shore)	**Habitat**				**Species**	
	Coastal saltmarshes and saline reedbeds	**Moderate energy intertidal rock**	**Intertidal mud**	**Intertidal sand and muddy sand**	**Tentacled lagoon-worm**	**Screening Justification**
Abrasion/disturbance of the substrate on the surface of the seabed	S	S	S	S	S	IN – Trampling associated with these activities may cause pressure to the features assessed. Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Habitat structure changes - removal of substratum (extraction)	S	S	S	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	S	S	S	S	S	IN – Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Removal of non-target species	S	S	S	S	IE	IN - Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Removal of target species		S	S	S		IN - Need to consider spatial scale/intensity of activity to determine likely magnitude of

						pressure
Visual disturbance		NS		NS		IN - Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Deoxygenation	NS	S	NS	S	NS	OUT – Insufficient activity levels to pose risk at level of concern
Hydrocarbon & PAH contamination	NA	NA	NA	NA	NA	OUT - Not applicable
Introduction of light		S	NS	S		OUT - Insufficient activity levels to pose risk of large scale pollution event
Introduction or spread of invasive non-indigenous species (INIS)	S	S	S	S	IE	OUT – Insufficient activity levels to pose risk of large scale pollution event
Litter	S	NA	NA	NA	NA	OUT – Insufficient activity levels to pose risk of large scale pollution event
Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)	NA	NA	NA	NA	NA	OUT - Not applicable
Transition elements & organo-metal (e.g. TBT) contamination	NA	NA	NA	NA	NA	OUT - Not applicable