Marine Conservation Zone Assessment document: TSAC – Detailed 033

Marine Conservation Zone:	**Tweed Estuary SAC**
Generic sub-feature(s):	Intertidal Mixed sediment, Intertidal Mud, Intertidal Mud and Sand.
Gear type(s):	**Digging with forks**
NIFCA MCZ Assessment type:	**Detailed**
Gear/feature interaction reference(s):	**TSAC – 345 TSAC – 346 TSAC - 347**

Revision history		
Date	***Revision***	***Editor***
18/09/2018	Document created. Sections 1, 2, 3 and 4 completed.	NW
07/06/2019	Sections 5 and 6 completed.	NW
04/01/2022	Intertidal activity sightings updated, document checked and revised.	BH
10/01/2022	Internal review	AA
30/11/2022	Assessment agreed with NE	CLS AA BH KS

Test for Likely Significant Effect (LSE)

TSAC – 334: Intertidal Mud
TSAC – 335: Intertidal Mud and Sand
TSAC – 336: Intertidal Mixed sediment

1. Is the activity/activities directly connected with or necessary to the management of the site for nature conservation?	No
2. What pressures (such as abrasion, disturbance) are potentially exerted by the gear type(s)? Pressures listed are all those for which the feature is deemed to be sensitive. Pressures in bold are Medium-High Risk. The sensitivities listed are based on the 2022 Conservation Advice available on Natural England's Designated Sites System.	**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** Introduction or spread of invasive non-indigenous species (INIS) Deoxygenation (Intertidal sand and muddy sand only) Introduction of light (Intertidal sand and muddy sand only)

3. Is the feature potentially exposed to the pressure(s)?	Yes

4. What are the conservation objectives for the feature? Conservation Objectives which may be impacted by bait digging are underlined.	• Maintain the presence and spatial distribution of mudflat and sandflat communities according to the map [MAGIC map application]. • Maintain the total extent, spatial distribution and types of mudflats and sandflats. • [Maintain OR Recover OR Restore] the abundance of listed typical species, to enable each of them to be a viable component of the habitat. • Restrict the introduction and spread of non-native species and pathogens, and their impacts. • Maintain the distribution of sediment composition types across the feature (presence / absence of areas mapped in GIS), compared to an established baseline, to ensure continued structural habitat integrity and connectivity. • Maintain total organic carbon (TOC) content in the sediment at existing levels. • Maintain the species composition of component communities. • Maintain the presence of topographic features, while allowing for natural responses to hydrodynamic regime, by preventing erosion or deposition through human-induced activity. • Maintain the natural physical energy resulting from waves, tides and other water flows, so that the exposure does not cause alteration to the biotopes, and stability, across the habitat. • Maintain the natural physico-chemical properties of the water. • Reduce surface sediment contaminant levels to concentrations where they are not adversely impacting the infauna of the feature. • Maintain sediment transport pathways to and from the feature to ensure replenishment of the feature, and / or replenishment of habitats that rely on the sediment supply from the feature. • Restrict aqueous contaminants to levels equating to High / Good Status according to Annex VIII and X of the Water Framework Directive, avoiding deterioration from existing levels. • Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels. • Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features from existing levels.

	• Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.

5. What are the potential effects/impacts of the pressure(s) on the feature, taking into account the exposure level?	Bait digging is widely practiced to support both commercial and recreational fishing (Cunha *et al.*, 2005). It occurs mainly on intertidal sand and muddy sand, as well as mud, where there is high abundance of lugworms (*Arenicola marina* and *A. defodiens*) and ragworm (*Alitta virens*). All species occur in sheltered areas of finer sediment, with ragworm occurring on the finest sediments (mud) typically within estuaries. Bait digging does not occur in areas with larger coarse sediment and is therefore unlikely to occur on the mixed sediments of the Tweed Estuary which consist of larger sediments overlying sand and mud (Designated Sites). The largest areas of intertidal sand and muddy sand are located at the estuary mouth at Sandstell Point on the south shore and Calot Shad on the north shore. Sandstell Point is a prominent raised area of clean sand, gravel and shingle and therefore unlikely to be suitable for bait digging, while more suitable muddy sand is at Calot Shad. Intertidal mud areas are generally found further upstream in the estuary, though there is a small amount at Calot Shad as well. The intertidal mud communities are dominated by ragworms and other infauna (Designated Sites) and could therefore be potential sites for bait digging for this species. <u>Bait digging activity within the Tweed Estuary SAC</u> NIFCA officers record sightings of bait digging activity observed during routine patrols when a site visit coincides with low water (± 2 hours). Within the Tweed Estuary SAC between January 2016 and December 2021, there were 36 patrols to the Tweed Estuary SAC. NIFCA officers observed no bait digging activity (Annex 1) and very little intertidal activity in general, with one sighting of periwinkle collection, and multiple anglers. This contrasts with the intertidal area to the north of the pier, outside of the Tweed Estuary SAC, which is a known bait digging hotspot and regularly patrolled. This suggests habitats within the SAC are not suitable for this activity at least in the lower part of the estuary which is regularly patrolled (to access the pier, patrols drive along the seaward estuary). There are no sightings of intertidal activity further upstream at all, including recordings of ‘no activity’ (NIFCA data). There is a good view from the bridge of further upstream however this area does not tend to be targeted on patrols. According to officer knowledge there is no known bait digging within the Tweed Estuary. There is moderate to high confidence in our inference that there is low activity levels in the Tweed Estuary SAC due to the number of patrols to the area.

	Since early 2021, the use of the Survey123 App has allowed other partners and individuals to record intertidal activities in addition to NIFCA patrols. The River Tweed Commission have recorded activities in the estuary (mainly angling) however no bait digging activities were recorded. **NIFCA conclude with high confidence that due to the lack of pressure within the Tweed Estuary SAC, this activity will not adversely impact the conservation objectives of the site, through the pressures listed above.**	
6. Condition and Conservation Objective Inferences	No information on the condition of the Tweed Estuary SAC features is available on Natural England's Designated Site System.	
7. Is the potential scale or magnitude of any effect likely to be significant?	**Alone:** **No**	**OR In-combination** **No**
8. Have NE been consulted on this LSE test? If yes, what was NE's advice?	**Yes** Synthesis of evidence and local knowledge informing this decision occurred between September 2018 and the date of this document's creation with stakeholders (where appropriate) and other statutory authorities. Natural England (CS) was involved with this informal process.	

Conclusion

Is the proposal likely to hinder the conservation objectives of the SAC either 'alone or in combination' on the Tweed Estuary SAC?

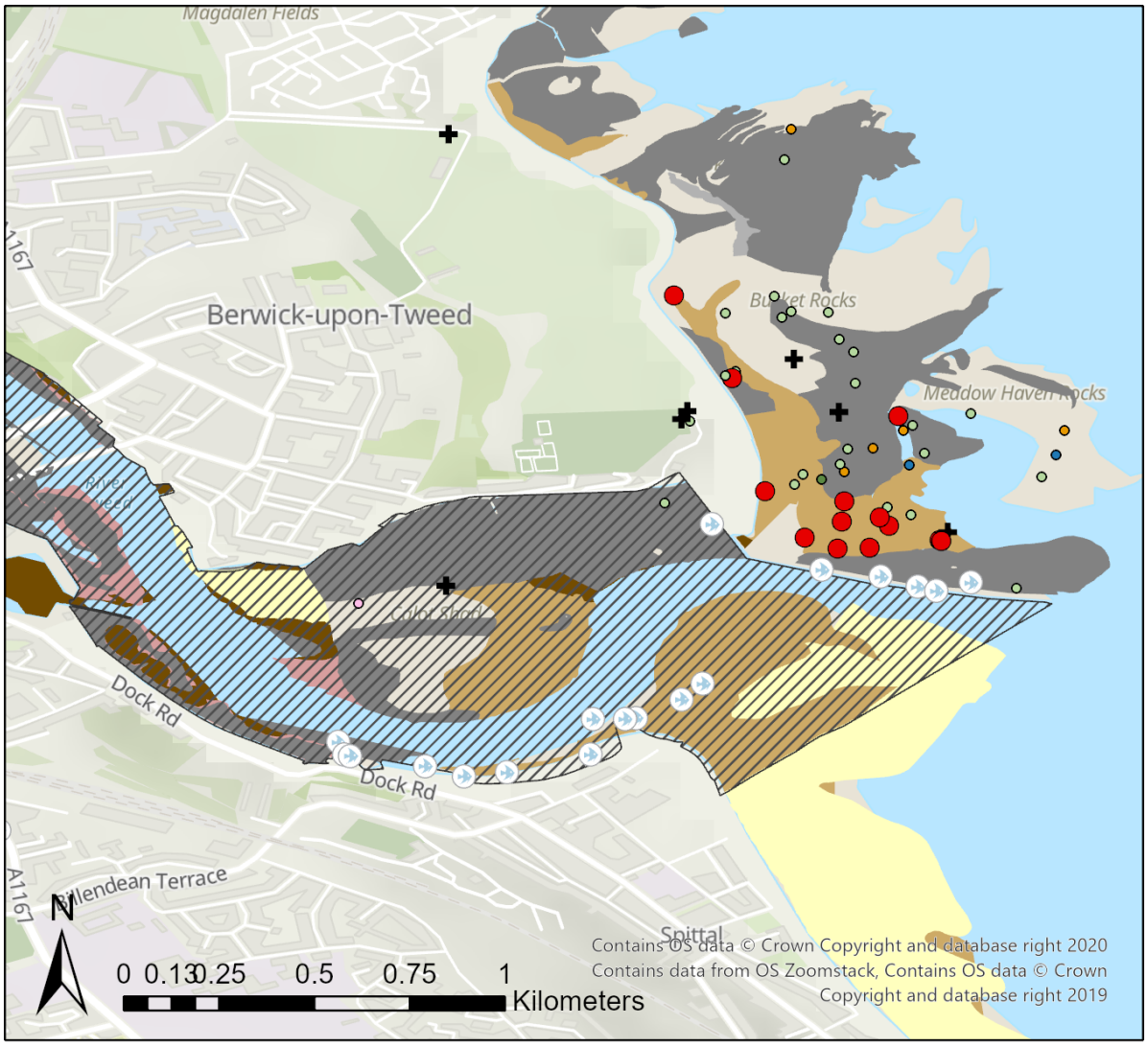
No

Has Natural England been formally consulted on this Simple LSE Assessment (and do they agree)?	**Yes**

Date of document completion/'sign-off':	**30/11/2022 CLS**

Annex 1

Intertidal activity sightings from NIFCA patrols from 2016 – October 2021 in addition to other partner organisations in 2021 (mainly Tweed River Commission) within and nearby the Tweed Estuary SAC, showing intertidal habitats including sand and muddy sand, mud and mixed sediments.



Intertidal Activity

- Angling
- Bait Digging
- Cleeking
- No activity
- Periwinkle gathering
- Potting
- Seaweed Collection
- Bait collection - mussels

Tweed Estuary SAC

EUNIS Habitat Classification

- A1 - Littoral rock
- A1.1 - high energy littoral rock
- A1.2 - moderate energy littoral rock
- A1.3 - low energy littoral rock
- A1.4 - littoral rockpools
- A2.1 - Littoral coarse sediment
- A2.2 - Littoral sand and muddy sand
- A2.3 - Littoral mud
- A2.4 - Littoral mixed sediments
- A2.5 - Coastal saltmarshes and saline reedbeds
- A2.6 - Littoral sediments dominated by aquatic angiosperms
- A2.7 - Littoral biogenic reefs