Fisheries in EMS Habitats Regulations Assessment for Amber and Green risk categories

European Marine Site: Exe Estuary SPA

Fishing activities assessed: Digging with forks

D&S IFCA Interaction ID	Fishing Activity	Feature(s)	Supporting habitat
HRA_UK9010081_E40	Bait Digging	• Non-breeding Avocet • Non-breeding Black-tailed godwit • Non-breeding Dark-bellied Brent goose • Non-breeding Dunlin • Non-breeding Grey plover • Non-breeding Oystercatcher • Non-breeding Slavonian grebe • Waterbird assemblage	Intertidal seagrass

Version Control History			
Version	**Author**	**Date**	**Comment**
1	Katherine Stephenson	01/03/19	Final draft complete to be sent to NE.
	Sarah Clark	22/03/2019	QA'ing. Final to be sent to NE.

Contents

1. Introduction

1.1 Need for an HRA assessment

In 2012, the Department for Environment, Food and Rural Affairs (Defra) announced a revised approach to the management of commercial fisheries in European Marine Sites (EMS). The objective of this revised approach is to ensure that all existing and potential commercial fishing activities are managed in accordance with Article 6 of the Habitats Directive.

This approach is being implemented using an evidence based, risk-prioritised, and phased basis. Risk prioritisation is informed by using a matrix of the generic sensitivity of the sub-features of EMS to a suite of fishing activities as a decision making tool. These sub-feature-activity combinations have been categorised according to specific definitions, as red, amber, green or blue.

Activity/feature interactions identified within the matrix as red risk have the highest priority for implementation of management measures by the end of 2013 in order to avoid the deterioration of Annex I features in line with obligations under Article 6(2) of the Habitats Directive.

Activity/feature interactions identified within the matrix as amber risk require a site-level assessment to determine whether management of an activity is required to conserve site features. Activity/feature interactions identified within the matrix as green also require a site level assessment if there are “in combination effects” with other plans or projects.

Site level assessments are being carried out in a manner that is consistent with the provisions of Article 6(3) of the Habitats Directive. The aim of this assessment is to determine whether management measures are required in order to ensure that fishing activity or activities will have no adverse effect on the integrity of the site. If measures are required, the revised approach requires these to be implemented by 2016.

The purpose of this site specific assessment document is to assess whether or not in the view of Devon and Severn Inshore Fisheries and Conservation Authority (D&S IFCA) the fishing activity of “bait digging” has a likely significant effect on the intertidal seagrass feature of the Exe Estuary SPA, and on the basis of this assessment whether or not it can be concluded that bait digging will not have an adverse effect on the integrity of this EMS.

1.2 Documents reviewed to inform this assessment

- Natural England’s risk assessment Matrix of fishing activities and European habitat features and protected species
- Reference list (Annex 1)
- Natural England’s consultation advice (Annex 2)
- Site map(s) – sub-feature/feature location and extent (Annex 3)
- Fishing activity data (map(s), etc.) (Annex 4)

2. Information about the EMS

The Exe Estuary SPA includes both marine areas (i.e. land covered continuously or intermittently by tidal waters) and land which is not subject to tidal influence. Sub-features have been identified which describe the key habitats within the European Marine Site necessary to support the birds that qualify within the SPA. Bird usage of the site varies seasonally, with different areas being favoured over others at certain times of the year. The mussel beds in particular are important in supporting the wintering wader and wildfowl assemblage to enable them to acquire sufficient energy reserves to ensure population survival (English Nature, 2001 & Natural England, 2015). Figure 1 (Annex 3) shows the boundary of the Exe Estuary SPA.

2.1 Overview and qualifying features

The Exe Estuary SPA qualifies under Articles 4.1 and 4.2 of the EU Birds Directive by supporting the following interest features (Natural England, 2015):

- Non-breeding Avocet (*Recurvirostra avosetta*)
- Non-breeding Black-tailed godwit (*Limosa limosa islandica*)
- Non-breeding Dark-bellied Brent goose (*Branta bernicia bernicia*)
- Non-breeding Dunlin (*Calidris alpina alpina*)
- Non-breeding Grey plover (*Pluvialis squatarola*)
- Non-breeding Oystercatcher (*Haematopus ostralegus*)
- Non-breeding Slavonian grebe (*Podiceps auritus*)
- Waterbird assemblage

The key supporting habitats are:

- Circalittoral rock
- Freshwater and coastal grazing marsh
- Infralittoral rock
- Intertidal biogenic reef: mussel beds
- Intertidal coarse sediment
- Intertidal mixed sediments
- Intertidal mud
- Intertidal rock
- Intertidal sand & muddy sand
- Intertidal seagrass beds
- Intertidal stony reef
- Subtidal biogenic reefs: mussel beds
- Subtidal coarse sediment
- Subtidal mixed sediment
- Subtidal sand
- Subtidal seagrass beds
- Subtidal stony reef
- Water column
- Saltmarsh
    - Atlantic salt meadows (*Glauco-Puccinellietalla maritimae*)
    - Salicornia and other annuals colonising mud & sand
    - Spartina swards (*Spartinion maritimae*)

2.2 Conservation Objectives

The site's conservation objectives apply to the Special Protection Area and the individual species and/or assemblage of species for which the site has been classified.
The objectives are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- the extent and distribution of the habitats of the qualifying features
- the structure and function of the habitats of the qualifying features
- the supporting processes on which the habitats of the qualifying features rely
- the populations of the qualifying features
- the distribution of the qualifying features within the site

3. Interest feature(s) of the EMS categorised as 'red' risk and overview of management measure(s)

None – this site has no gear-feature interactions categorised as "red" risk.

4. Information about the fishing activities within the site

A full description of D&S IFCA's current understanding of the levels and distribution of bait digging within the Exe Estuary SPA can be found in Stephenson (2019). Bait digging occurs on the intertidal sand and mudflats, with effort being highest on the eastern shore of the estuary, in the Cockle Sands & Shelley Bank area. Bait digging occurs on the Exe all year round, peaking in the summer on the eastern shore, but in the autumn on the western shore.

During May and June 2016 D&S IFCA conducted survey visits to the estuary to identify the level of Intertidal handwork occurring (results can be found in Annex 6). The surveys looked at shellfish collection, crab tiling, and bait digging. Bait digging accounted for just over one third of the hand-gathering activity observed during the survey (35% of activity on the west shore, 38% on the east shore). Throughout the survey the estuary was visited 16 times, with bait diggers being seen on nine of these visits. 12 bait diggers were observed on five weekday visits, and six diggers were seen over four weekend visits. This suggests this activity occurs at slightly higher levels during weekdays, which is contrary to the general pattern of total hand-gathering activity (Figure 10). However, in line with the general pattern of hand-gathering activity (Figure 9), the majority of bait digging took place on spring tides, with 15 bait diggers observed over seven visits which occurred on spring tides, whereas diggers were only seen on two visits occurring on neap tides (a total of three diggers). Therefore, it seems this activity is largely temporally limited by spring tides.

Other fishing activities within the EMS are described in the Fishing Activity Report (Gray, 2015).

5. Test for Likely Significant Effect (LSE)
5.1 Table 1: Assessment of LSE

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)	• Above water noise (Bird features - Sensitive) • Visual disturbance (Bird features - Sensitive) • Abrasion & disturbance of the substrate on the surface of the seabed (Supporting habitat - Sensitive) • Penetration/disturbance of the substrate below the surface of the seabed, including abrasion (Supporting habitat – Sensitive) • Physical changes (to another seabed type) (Supporting habitat – Sensitive) • Removal of non-target species (Bird feature & supporting habitat – Sensitive) • Removal of target species (Supporting habitat – Sensitive) See Annex 7 for Pressures Audit Trail	
3. Is the feature potentially exposed to the pressure(s)?	**Yes,** there are currently no management measures restricting bait digging in the Exe Estuary SPA.	
4. What are the potential effects/impacts of the pressure(s) on the feature, taking into account the exposure level?	The intertidal sediment supporting habitats have the following targets (Natural England, 2015): • Maintain the structure, function & supporting processes associated with the feature and its supporting habitat (all bird features) • Maintain the extent & distribution of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period (all bird features) • Maintain the distribution, abundance & availability of the most important prey items (avocet, black-tailed godwit, dunlin, grey plover, Slavonian grebe) • Restore availability of key prey at preferred sizes (oystercatcher) • Maintain the structure, function & availability of the habitat, which supports the assemblage feature for all stages of the non-breeding period (waterbird assemblage) The bird features have the following target: • The frequency, duration &/or intensity of disturbance affecting foraging &/or roosting should not reach levels that substantially affect the feature. Given that the features/supporting habitats could be exposed to the pressures listed in Section 2 of this table, there is potential that these targets will not be met.	
5. Is the potential scale or magnitude of any effect likely to be significant?	**Alone**	**Yes,** there is potential for likely significant effect.
	In-combination	See Section 8.

6. Have NE been consulted on this LSE test? If yes, what was NE's advice?	NE has not been consulted at this time.

6. Appropriate Assessment

6.1 Potential risks to features

The potential pressures, impacts and exposure by gear type(s) for each feature/sub-feature are summarised in Table 2.

Table 2: Summary of Impacts

Feature/ Supporting habitat(s)	**Target Attributes/Conservation Objectives**	**Potential pressure (such as abrasion, disturbance) exerted by gear type(s)**	**Potential ecological impacts of pressure exerted by the activity/activities on the feature** *(reference to conservation objectives)*	**Level of exposure of feature to pressure**	**Mitigation measures**
All bird features • Intertidal coarse sediment • Intertidal mixed sediment • Intertidal mud • Intertidal sand & muddy sand	**Target Attribute:** • Maintain the structure, function & supporting processes associated with the feature and its supporting habitat • Maintain the extent & distribution of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period **Conservation Objective:** Maintain or restore: • the extent and distribution of the habitats of the qualifying features • the structure and function of the habitats	Abrasion & disturbance of the substrate on the surface of the seabed. Penetration/disturbance of the substrate below the surface of the seabed, including abrasion. Physical changes (to another seabed type).	d'Aveck et al. (2014) gave seagrass a "medium" sensitivity to abrasion & disturbance of the substrate (Low resistance, and medium resilience). Seagrasses are not physically robust. The leaves and stems of seagrass plants rise above the surface and the roots are shallowly buried so that they are vulnerable to surface abrasion. The removal of above-ground biomass would result in a loss of productivity whilst the removal of roots would cause the death of the plant. Heavy abrasion accompanied by crushing or compaction of sediments would lead to more severe effects. They classed seagrass as "high" sensitivity to penetration/disturbance of the substrate (no resistance, low resilience). Abrasion to the sub-surface will directly impact seagrass habitats as the plant is confined to the upper layer of the sediment. The shallow root systems are thus likely to be removed	The intertidal seagrass beds in the Exe Estuary SPA are currently covered by a voluntary code of conduct, which states that bait diggers should not dig near the seagrass (EEMP, 2018). Following reports of bait digging occurring on the seagrass beds in the Duck Pond area of the estuary, just off the Rec Ground at Exmouth, D&S IFCA carried out further monitoring surveys in this area, the results of which are detailed in Stephenson (2019). Although there were no records of diggers working directly on the seagrass beds, the mapped data does show some overlap between	Through the IFCA's Byelaw Review process, D&S IFCA will be reviewing all byelaws relating to hand working (including bait digging). Options for management will include, no action, voluntary measures and the potential introduction of a Hand Working Byelaw, which would allow the IFCA to monitor levels of this activity in the future, and adapt to changes in effort/ environmental conditions if necessary. As there appears to be some overlap between

	of the qualifying features • the supporting processes on which the habitats of the qualifying features rely		leading to the death of the plant. Finally, d'Aveck et al. (2014) classed seagrass as "high" sensitivity to physical change to another seabed type (low resistance, and very low resilience). Seagrass beds occur almost exclusively in shallow and sheltered coastal waters anchored in sandy and muddy bottoms. A physical change to another seabed type will therefore have a detrimental effect on seagrass beds as they will be excluded from the newly created habitat. A change towards a coarser sediment type would inhibit seagrasses from becoming established due to a lack of adequate anchoring substratum. A more mud dominated habitat on the other hand could increase sediment re-suspension and exclude seagrasses due to unfavourable light conditions. Garmendia et al. (2017) found that shoot density of seagrass decreased with trampling as part of shellfishing activity. They concluded that shellfishing adversely effects seagrass abundance.	bait digging activity and the seagrass (Figure 3, Annex 4). Bait digging occurs at low tide (mostly spring tides), all year round.	the feature and the activity (despite the voluntary closure) which could be having detrimental impacts, the IFCA's Byelaw and Permitting Sub-committee will consider what management may be appropriate for this activity close to and in the seagrass areas of the EMS. The level of overlap between the feature and activity is uncertain but, as the extent of seagrass beds shifts over time, D&S IFCA may consider introducing a buffer zone around the known extent of the seagrass.
Waterbird assemblage • Intertidal coarse sediment • Intertidal mixed sediment • Intertidal mud • Intertidal	**Target Attribute:** • Maintain the structure, function & availability of the habitat, which supports the assemblage feature for all stages of the non-breeding period **Conservation Objective:** Maintain or restore:	Abrasion & disturbance of the substrate on the surface of the seabed. Penetration/disturbance of the substrate below the surface of the seabed, including	See above.	See above.	See above.

sand & muddy sand	• the extent and distribution of the habitats of the qualifying features • the structure and function of the habitats of the qualifying features • the supporting processes on which the habitats of the qualifying features rely	abrasion. Physical changes (to another seabed type).			
Avocet, Black-tailed godwit, Dark-bellied Brent goose, Dunlin, Grey plover, Oystercatcher • Intertidal coarse sediment • Intertidal mixed sediment • Intertidal mud • Intertidal sand & muddy sand	**Target Attribute:** • Maintain the area of open and unobstructed terrain around roosting and feeding sites. **Conservation Objective:** Maintain or restore: • the extent and distribution of the habitats of the qualifying features • the structure and function of the habitats of the qualifying features	Physical change to another seabed type. Visual disturbance.	Bait digging would not obstruct line of sight on the seagrass beds.	Obstruction to the seagrass beds caused by bait digging is not believed to be significant to prohibit bird features from feeding.	No mitigation necessary.
Grey plover, Slavonian Grebe • Intertidal coarse sediment • Intertidal	**Target Attribute:** • Maintain the distribution, abundance & availability of the most important prey items **Conservation**	Removal of target species.	d'Aveck et al. (2014) described how seagrass habitats are not dependant on other organisms likely to be removed by fishing activities. Removal of other species will therefore not have a significant biological impact. Therefore, "not sensitive"	See first row.	See first row.

mixed sediment • Intertidal mud Intertidal sand & muddy sand	**Objective:** Maintain or restore: • the populations of the qualifying features • the distribution of the qualifying features within the site		to this pressure. However, digging as part of fishing activity can result in the non-targeted removal of seagrass.		
All bird features (in relation to the intertidal sediment supporting habitats)	**Target Attribute:** • The frequency, duration &/or intensity of disturbance affecting foraging &/or roosting should not reach levels that substantially affect the feature. **Conservation Objective:** Maintain or restore: • the populations of the qualifying features • the distribution of the qualifying features within the site	Above water noise. Visual disturbance.	Bird disturbance is also a major concern, especially where peak bait digging coincides with peak bird abundance or intertidal activity (Townshend and O'Connor, 1993). Bait collection has been found to induce a 'temporary loss of habitat' for some bird species, with bait collector numbers negatively correlating with wader and gull abundance (Watson et al., 2017). Wildfowl, such as mute swans may be the least likely group to be vulnerable to disturbance, as many of these species are fed directly by humans (Liley and Fearnley 2012, Watson et al. 2017). Lugworm is an important prey item for the Grey Plover and the Bar-Tailed Godwits in the Severn (Goss-Custard et al., 1991). There is an important link between macrofaunal biomass (energy content) and the behaviour of wading birds. Wading birds have been shown to extend their feeding period, increase their attack rate, broaden their prey or move to different areas in order to cope with reductions in infaunal biomass (Zwarts, 1993). Although the process of bait digging can directly target prey items for certain bird	Bait digging occurs at low tide (mostly spring tides), two hours either side of low, during the day, all year round. However, bait digging levels were generally lowest in the winter, when the over-wintering bird populations would be present. Bait diggers usually work as a hobby or as and when they need bait for recreational angling. Bait digging is usually a slow, solitary and quiet process. Disturbance would cause a temporary change in distribution and reduction in bird numbers where bait digging is occurring. The extent of disturbance from human presence would be a bait digger walking from the shore to the area of digging, the area worked, and then walking back to the shore line.	Through the IFCA's Byelaw Review process, D&S IFCA will be reviewing all byelaws relating to hand working (including bait digging). Options for management will include, no action, voluntary measures, and the potential introduction of a Hand Working Byelaw, which would allow the IFCA to monitor levels of this activity in the future and adapt to changes in effort/ environmental conditions if necessary.

			species, it can also indirectly impact the forging efficiency of wading birds through increased mortality of associated invertebrate fauna. For example, Shepherd and Boates (1999) found that foraging efficiency of sandpipers was significantly lower in areas targeted for bait digging of bloodworms. Foraging efficiency decreased by 68.5%. This species of bait is not a prey item for the sandpiper but the process of bait digging resulted in a 38% decrease in density of their amphipod prey, *Corophium volutator,* after one year of baitworm harvesting in the Bay of Fundy. This decrease was as a result of direct mortality and lower juvenile recruitment. It was also observed that sandpipers on dug regions took longer to build up fat deposits needed for migration. As well as impacting habitats and prey species used by birds, the birds themselves can be impacted by bait digging activities by way of disturbance. Goss-Custard and Verboven (1993) found that the presence of people in areas used for feeding and breeding can alter the behaviour and distribution of estuarine birds. Meaning the birds may become displaced into areas with a lower prey density. A disturbance review by the Exe Estuary Management Partnership (2016) summarised that disturbance levels can be dictated by a number of factors such as noise level, amount of activity and number of people present. However, disturbance by bait		

			collection generally occurs via visual (seeing the collector and responding as if they were a potential predator) and/or noise disturbance (causing distress via deviation from the “natural” ambient noise). Liley et al. (2011) found that whilst bait-digging and crab-tiling accounted for 7% of bird disturbance events in their study on the Exe Estuary, this was just a count of number of events, and bait-digging actually accounted for 16% of all major flight events. Liley et al. (2012) carried out observational surveys in Poole Harbour, recording activities which resulted in bird disturbance. For 93% of observations there was no response from birds, only 1% resulted in major flights. 1558 potential disturbance events were recorded over 63 hours of survey. During the 63 hours of surveillance there were just five individual disturbance events involving bait collection, none resulted in the birds being flushed. Townshend and O’Connor (1993) found that disturbance caused by bait digging activity greatly reduced the extent of use of the Lindisfarne National Nature Reserve (NNR) by wigeon, bar-tailed godwit and redshank. However, significant increases in the populations of wildfowl were recorded in the year following a ban on bait digging. Urfi et al. (1996) looked at how oystercatchers compensate for lost feeding time following disturbance. They expected to find that feeding rates would increase,		

			however, instead they found that feeding time was extended. They also found that birds are able to habituate to the frequent presence of people within feeding areas, reducing the distance at which they take flight, therefore reducing the amount of feeding time lost. Goss-Custard and Verboven (1993) also found that oystercatchers subjected to minimal disturbance conditions have been known to habituate to the presence of people, depending on the movement of the individuals. However, De Boer and Langamane (1996) found that larger birds have longer Minimal Approach Distances (MADs) when influenced by human presence and their foraging activity decreases earlier when approached. Hockin et al. (1992), shows disturbance can have an effect on breeding success through several factors e.g. nest abandonment, increased mortality of eggs due to predation & increased mortality of young through reduced feeding. Disturbance can reduce use of sites by birds, and can affect nest site choice, having a negative effect on population density. It can also have a negative effect on energy budgets – time spent flying, reduces time spent feeding.		

7. Conclusion

Bait digging activity does appear to overlap with the intertidal seagrass within the SPA. The literature cited in the appropriate assessment has indicated that bait digging is potentially very detrimental to the seagrass beds, affecting their structure, function and distribution (d'Aveck et al., 2014). Trampling associated with bait digging will also decrease shoot density of seagrass (Garmendia et al., 2017).

Bait diggers are usually solitary, working only at low tide (usually on spring tides) for a couple of hours around the time of low water. Disturbance is only from the presence of bait diggers during this time. This disturbance may result in a temporary change in distribution and abundance of birds in vicinity of the bait digging activity.

Through the IFCA's Byelaw Review process, D&S IFCA will be reviewing all byelaws relating to hand working (including bait digging). Options for management include no action, voluntary measures, and the potential introduction of a Hand Working Byelaw, which would allow the IFCA to monitor levels of this activity in the future and adapt to changes in effort/ environmental conditions if necessary. During 2019, D&S IFCA's Byelaw and Permitting Sub-committee will consider the evidence from the research undertaken, the completed HRA and formal advice from Natural England to determine whether management would be appropriate, especially in relation to the bait digging activity that takes place close to or within the intertidal seagrass areas of the Exe Estuary SPA. Options might include a formal closed area to protect the intertidal seagrass from damage caused by bait digging, and a buffer zone around the known extent of the seagrass beds.

8. In-combination assessment

Bait digging occurs alongside other fishing activities within the Exe Estuary SPA (Gray, 2015). It is not believed that any other fishing activities interact with the intertidal seagrass.

The impact of future plans or projects will require assessment, including accounting for any in-combination effects, alongside existing activities.

9. Summary of consultation with Natural England

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

10. Integrity test

It can be concluded that bait digging, alone or in-combination, within the Exe Estuary SPA can adversely affect bird features and the intertidal seagrass supporting habitat and that the conservation objectives may not be met. Management measures are not currently in place; however, Devon and Severn IFCA is currently considering whether to introduce a permitting byelaw that will cover hand-gathering (including bait digging activity), and whether management of bait digging, to formally protect the seagrass beds, is required.

Annex 1: Reference list

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Watson G.J., Murray J.M., Schaefer M., Bonner A. and M. Gillingham (2017) Assessing the impacts of bait collection on inter-tidal sediment and the associated macrofaunal and bird communities: The importance of spatial scales, Marine Environmental Research 130: 122-133

Urfi A.J., Goss-Custard J., Lev S. & Durell D. (1996) The ability of oystercatchers Haematopus otralegus to compensate for lost feeding time: field studies on individually marked birds. Journal of Applied Ecology 33(4) 873-883.

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Annex 2: Natural England’s consultation advice

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

Annex 3: Site Maps

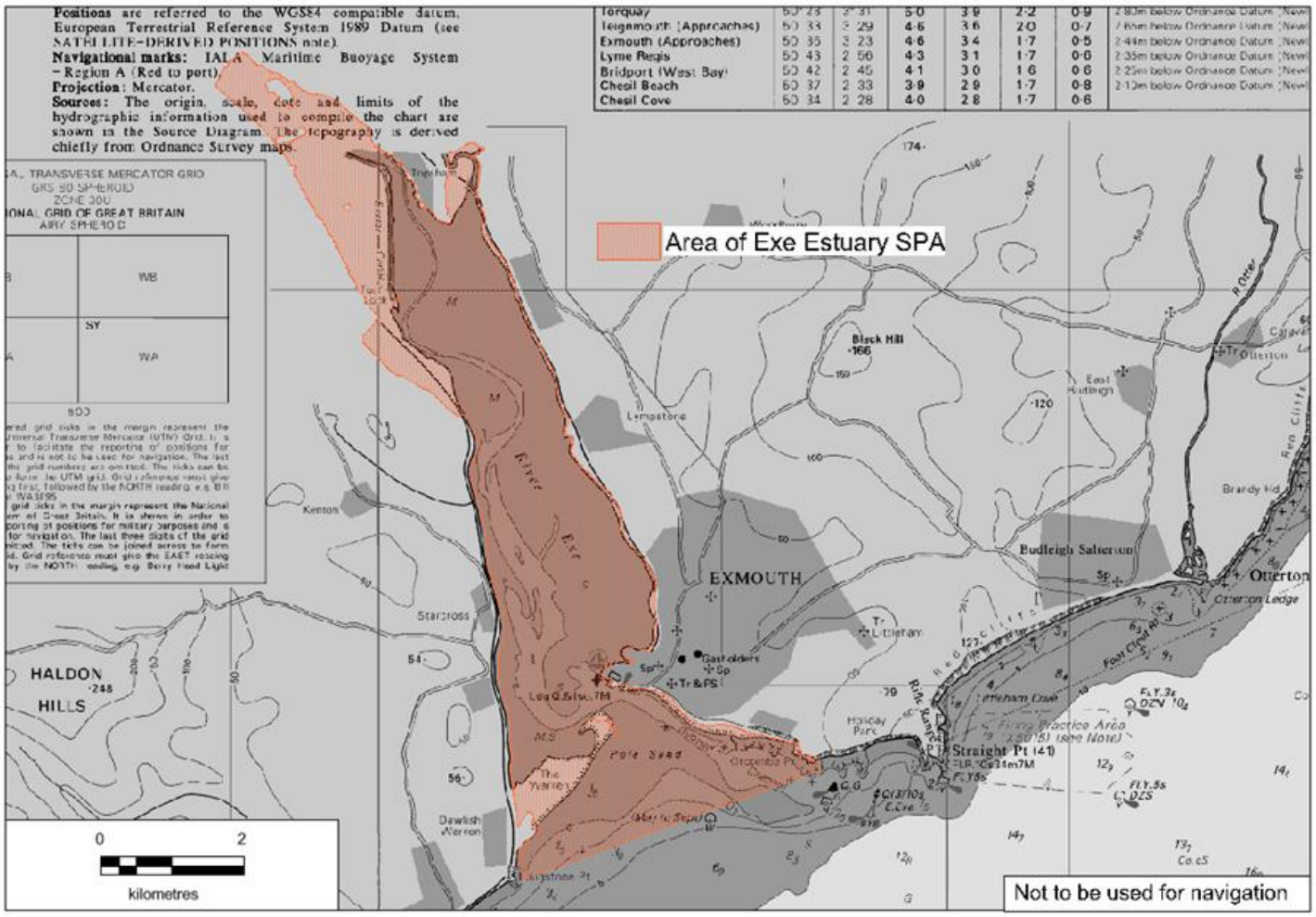


Figure 1 Exe Estuary SPA boundary (shown in red)

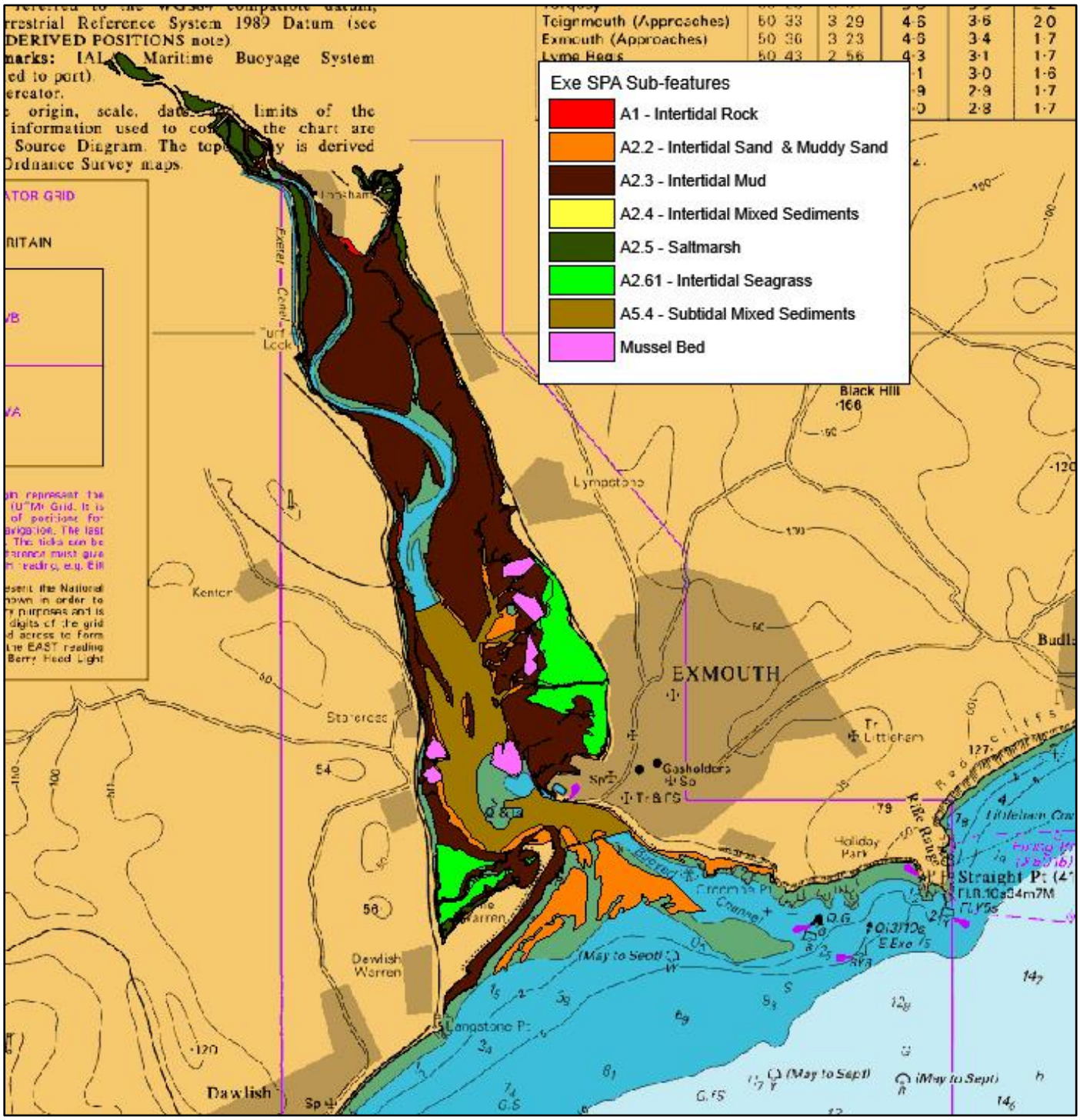


Figure 2 Exe Estuary SPA sub-features (Natural England, 2015)

Annex 4: Fishing activity maps

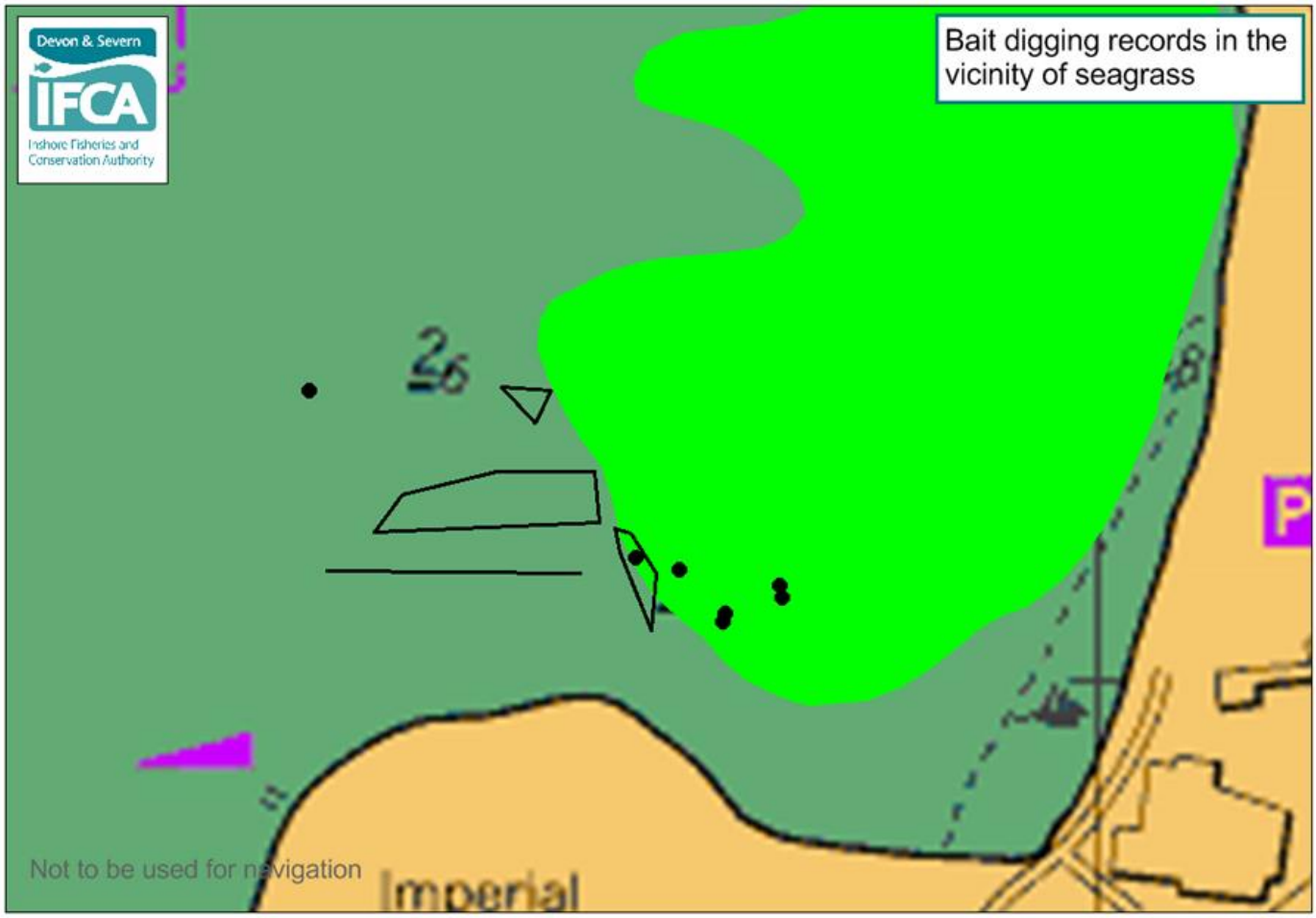


Figure 3 Records of bait digging activity in 2018 are shown in black (Stephenson, 2019) near the seagrass beds, shown in green (Environment Agency, 2019)

Annex 5: Bird usage of the Exe Estuary

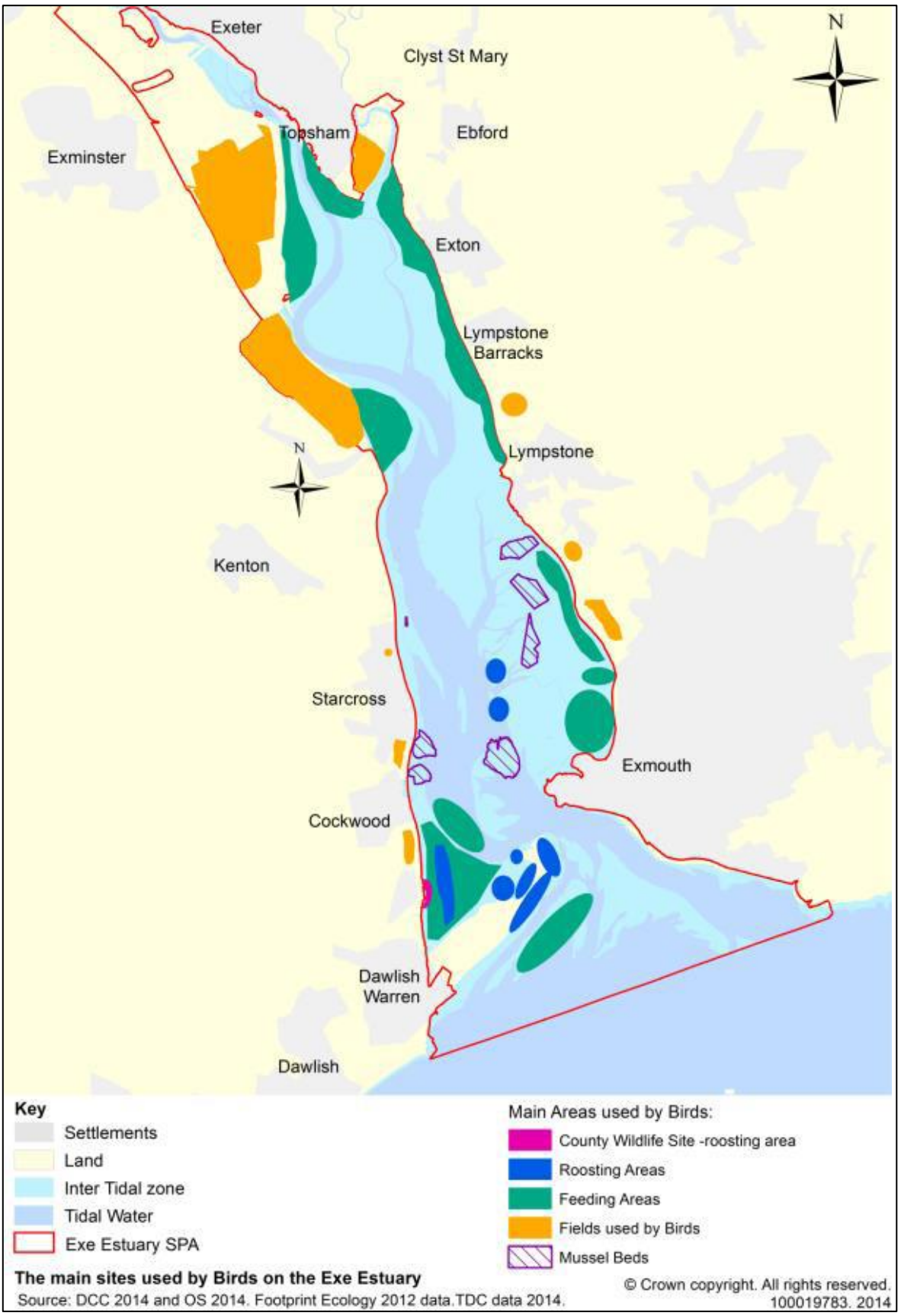


Figure 4 Main sites used by birds on the Exe Estuary (EEMP, 2014)

Annex 6: Summary of Results of the D&S IFCA Intertidal Handwork Survey

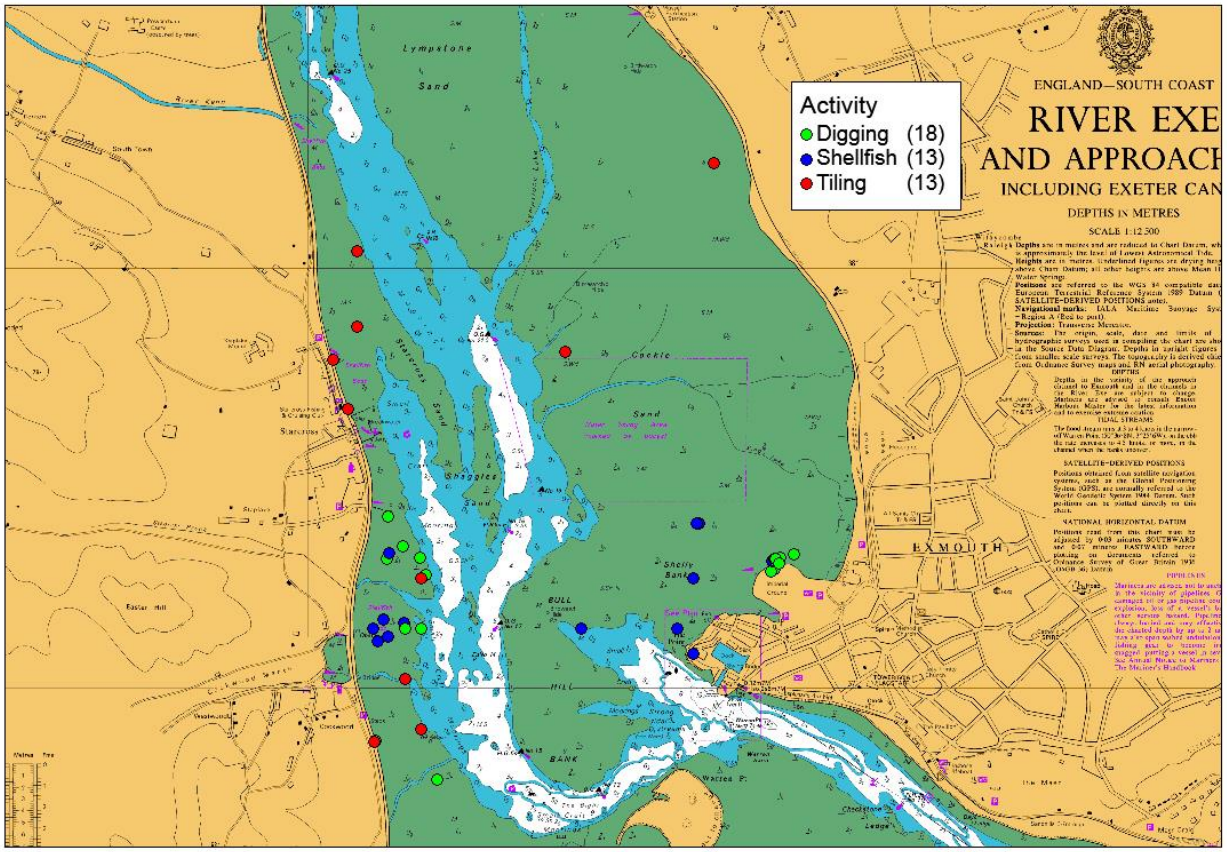


Figure 5 Total people observed (recreational & commercial) working in the intertidal area, shown by activity; bait digging, shellfish collection, and crab tiling.

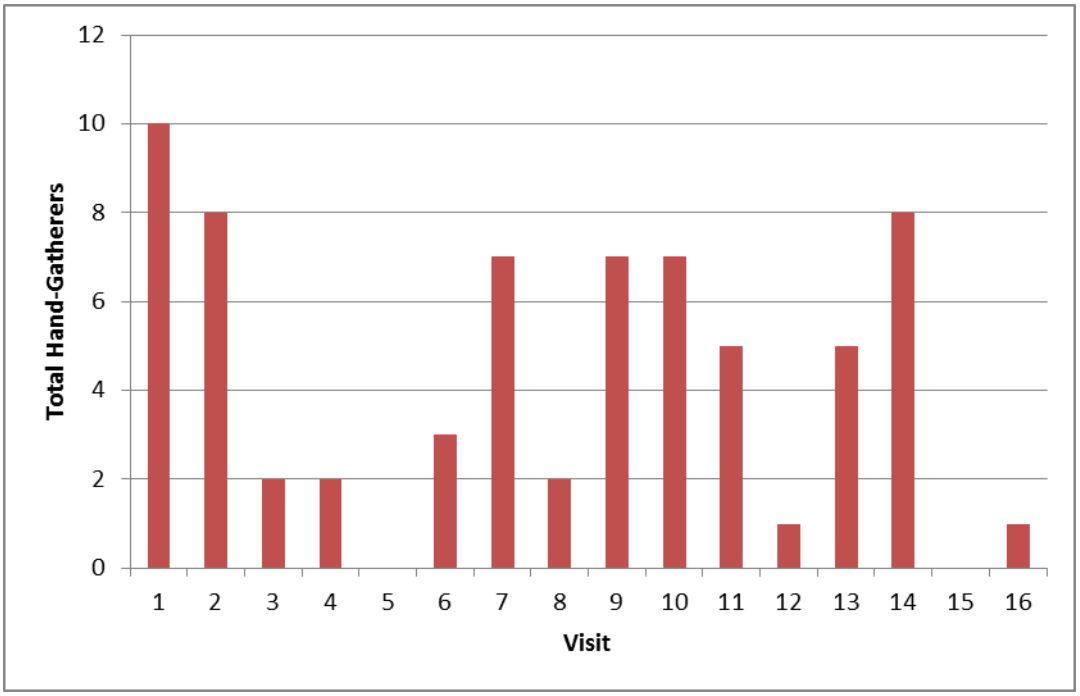
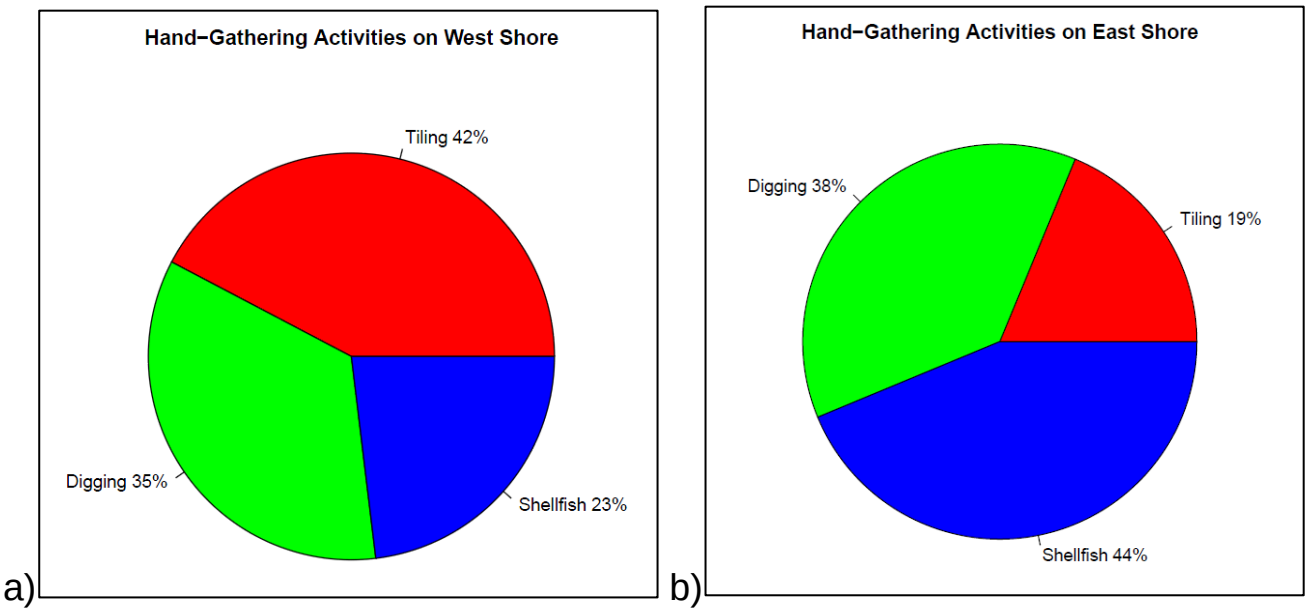


Figure 6 Total people observed (recreational & commercial) during each visit.



a) b)

Figure 7 Proportions of each activity on the West Shore (a) and East Shore (b)

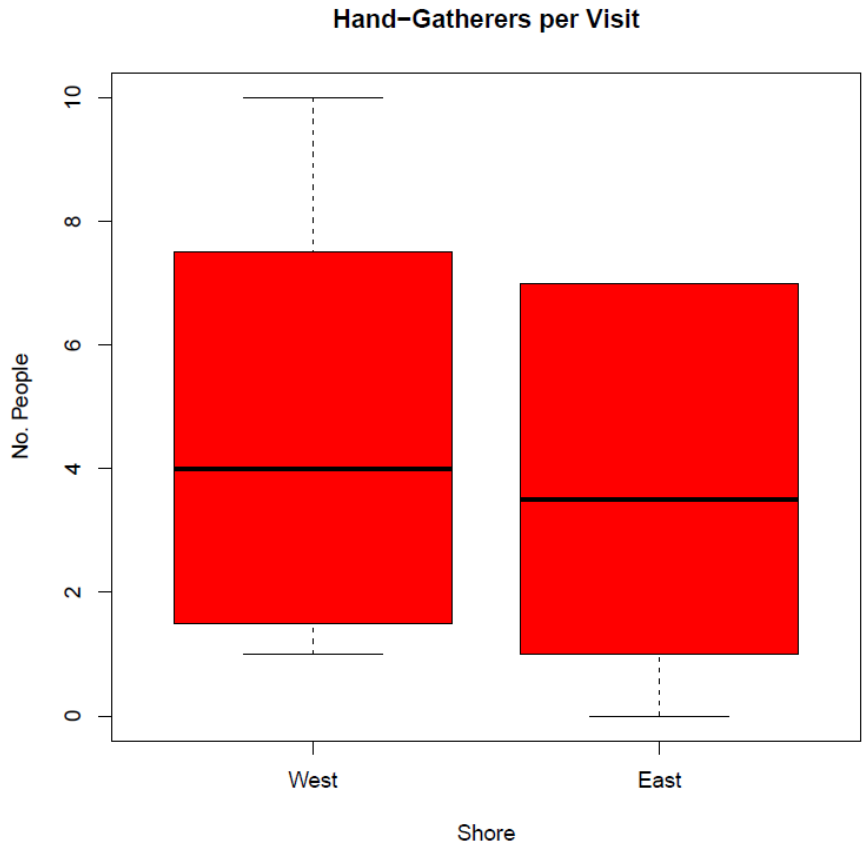


Figure 8 Numbers of people working on each shore per visit

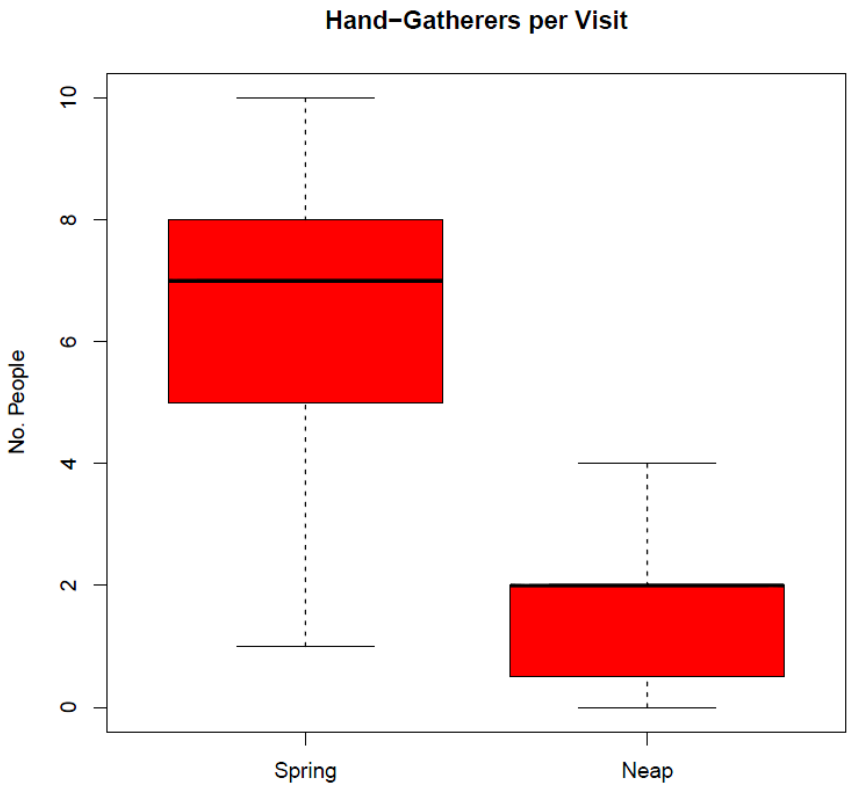


Figure 9 Numbers of people working during spring and neap tide visits

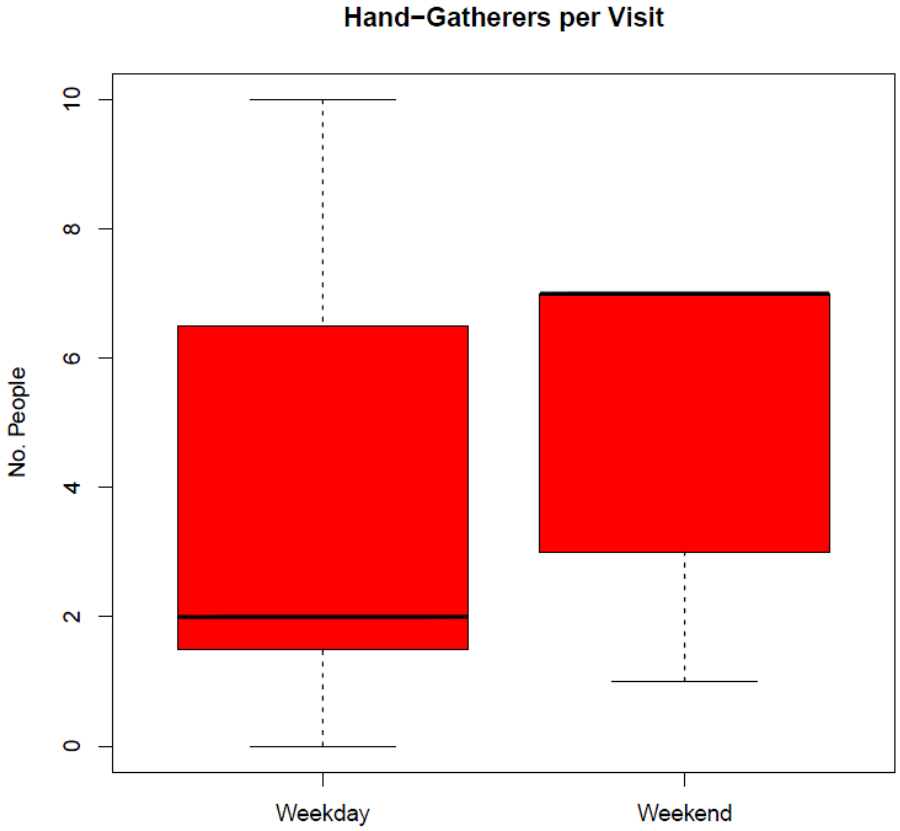


Figure 10 Numbers of people working during weekday and weekend visits

Annex 7: Pressures Audit Trail

Sensitivities based on Conservation Advice (Natural England, 2015)

Shore-based activities	Feature/Sub-feature & Screen Justification	
	Bird Feature	Intertidal seagrass
Above water noise	**Sensitivity: S** **IN -** Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure	
Abrasion/disturbance of the substrate on the surface of the seabed		**Sensitivity: S** **IN -** Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure.
Collision BELOW water with static or moving objects not naturally found in the marine environment	**Sensitivity: S** **OUT -** This interaction was only sensitive for Slavonian grebe with shore-based activities, so is considered extremely low risk.	
Deoxygenation		**Sensitivity: NS**
Genetic modification & translocation of indigenous species		**Sensitivity: S** **OUT** - Insufficient activity levels within proximity to this habitat to pose risk.
Hydrocarbon & PAH contamination.	**Sensitivity: IE** **OUT -** Insufficient activity levels to pose risk of large scale pollution event	**Sensitivity: NS**
Introduction of light	**Sensitivity: S** **OUT -** Insufficient activity levels within proximity to this habitat to pose risk.	
Litter	**Sensitivity: IE** (S for Slavonian grebe) **OUT –** Low risk of litter from bait digging activities.	**Sensitivity: IE** **OUT** – Low risk of litter from bait digging activities.
Penetration/disturbance of the substrate below the surface of the seabed, including abrasion		**Sensitivity: S** **IN** - Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure.
Physical changes (to another seabed type)		**Sensitivity: S** **IN** - Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure.
Removal of non-target species	**Sensitivity: S** **IN –** Mortality of prey from trampling.	**Sensitivity: S** **IN –** Mortality of prey from trampling.
Removal of target species		**Sensitivity: NS**
Visual disturbance	**Sensitivity: S** **IN -** Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure	