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

European Marine Site: Severn Estuary SAC

Fishing activities assessed: Bait collection

Gear/feature interactions assessed:

D&S IFCA Interaction ID	Fishing Activity	Feature(s)
HRA_ UK0013030_AE40	Digging with forks	Atlantic salt meadows

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 current level of effort of use of digging with forks has a likely significant effect on the interest features of the Severn Estuary SAC, and on the basis of this assessment whether or not it can be concluded that the current levels of activity relating to digging with forks 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[1]
- 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)

[1] See Fisheries in EMS matrix:
http://www.marinemanagement.org.uk/protecting/conservation/documents/ems_fisheries/populated_matrix3.xls

2. Information about the EMS

The Severn Estuary is the largest coastal plain estuary in the United Kingdom and one of the largest estuaries in Europe. It has the second largest tidal range in the world and the tidal regime determines not only the structure of the estuary and individual habitats but also the conditions affecting it and the biological communities it therefore supports (Natural England and CCW 2009). The Severn Estuary EMS includes both SAC and SPA designations which differ slightly in area although broadly overlap.

The Severn Estuary SAC includes the entire extent of the tidal influence from an upstream boundary between Frampton and Awre in Gloucestershire out seawards to a line drawn between Penarth Head in Wales and a location just west of Hinkley point in Somerset (Natural England and CCW 2009). It includes subtidal and intertidal areas landward to the line of high ground and flood defences (banks and walls) that provide the limit of tidal inundation. The overall area of the European conservation designations is 73,715.4 ha of which roughly two thirds is composed of subtidal habitats and one third is composed of intertidal habitats. The Estuary is an over-arching feature of the EMS which incorporates all aspects of the physical, chemical and biological attributes of the estuary as an ecosystem (Natural England and CCW 2009).

The estuary lies in the Severn Vale which includes the cities of Cardiff, Bristol, Newport and Gloucester, supporting a number of large-scale industries which exploit the estuaries natural resources.

2.1 Overview and qualifying features

Severn Estuary qualifies as a SAC for the following Annex I habitats as listed in the EU Habitats Directive (Natural England, 2015):

- **1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)**
- **1130 Estuaries**, key sub-features are:
    - Circalittoral rock
    - Infralittoral rock
    - Intertidal biogenic reef: *Sabellaria* spp.
    - Intertidal coarse sediment
    - Intertidal mixed sediments
    - Intertidal mud
    - Intertidal rock
    - Intertidal sand and muddy sand
    - Subtidal biogenic reefs: *Sabellaria* spp.
    - Subtidal coarse sediments
    - Subtidal mixed sediments
    - Subtidal mud
    - Subtidal sand
    - Estuarine fish community (Natural England and CCW, 2009)
    - Estuarine bird community (Natural England and CCW, 2009)
- **1140 Mudflats and sandflats not covered by seawater at low tide**, key sub-features are:
    - Intertidal coarse sediment
    - Intertidal mixed sediments
    - Intertidal mud
    - Intertidal sand and muddy sand
- **1170 Reefs**, key sub-features are:
    - Circalittoral rock
    - Infralittoral rock
    - Intertidal biogenic reef: *Sabellaria* spp.
    - Intertidal rock
    - Subtidal biogenic reef: *Sabellaria* spp.
- **1110 Sandbanks which are slightly covered by sea water all the time**, key sub-features are:
    - Subtidal coarse sediment
    - Subtidal mixed sediments
    - Subtidal mud
    - Subtidal sand

Severn Estuary qualifies as a SAC for the following Annex II species as listed in the EU Habitats Directive (Natural England, 2015):

- **1099 River lamprey (*Lampetra fluviatilis*)**
- **1095 Sea lamprey (*Petromyzon marinus*)**
- **1103 Twaite shad (*Alosa fallax*)**

2.2 Conservation Objectives

Severn Estuary SAC conservation objectives for the following Annex I habitats and Annex II species (Natural England and CCW, 2009):

- **1330 Atlantic salt meadow**
  The conservation objective for the "Atlantic salt meadow" feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:

  i. the feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:
  ii. the total extent of Atlantic salt meadow and associated transitional vegetation communities within the site is maintained;
  iii. the extent and distribution of the individual Atlantic salt meadow and associated transitional vegetation communities within the site is maintained;
  iv. the zonation of Atlantic salt meadow vegetation communities and their associated transitions to other estuary habitats is maintained;
  v. the relative abundance of the typical species of the Atlantic salt meadow and associated transitional vegetation communities is maintained;
  vi. the abundance of the notable species of the Atlantic salt meadow and associated transitional vegetation communities is maintained.
  vii. the structural variation of the salt marsh sward (resulting from grazing) is maintained within limits sufficient to satisfy the requirements of conditions iv and v above and the requirements of the Ramsar and SPA features
  viii. the characteristic stepped morphology of the salt marshes and associated creeks, pills, drainage ditches and pans, and the estuarine processes that enable their development, is maintained.
  ix. Any areas of *Spartina anglica* salt marsh are capable of developing naturally into other saltmarsh communities.

- **1130 Estuaries**
  The conservation objective for the "estuaries" feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:

  The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met

  i. the total extent of the estuary is maintained;
  ii. the characteristic physical form (tidal prism/cross sectional area) and flow (tidal regime) of the estuary is maintained;
  iii. the characteristic range and relative proportions of sediment sizes and sediment budget within the site is maintained;
  iv. the extent, variety and spatial distribution[4] of estuarine habitat communities within the site is maintained;
  v. the extent, variety, spatial distribution and community composition of hard substrate habitats and their notable communities is maintained;
  vi. the abundance of the notable estuarine species assemblages is maintained or increased;
  vii. the physio-chemical characteristics of the water column support the ecological objectives described above;
  viii. Toxic contaminants in water column and sediment are below levels which would pose a risk to the ecological objectives described above.
  ix. Airborne nutrient and contaminant loads are below levels which would pose a risk to the ecological objectives described above

- **1140 Mudflats and sandflats not covered by seawater at low tide**
  The conservation objective for "mudflats and sandflats" feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:

  The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:
  i. the total extent of the mudflats and sandflats feature is maintained;
  ii. the variety and extent of individual mudflats and sandflats communities within the site is maintained;
  iii. the distribution of individual mudflats and sandflats communities within the site is maintained;
  iv. the community composition of the mudflats and sandflats feature within the site is maintained;
  v. the topography of the intertidal flats and the morphology (dynamic processes of sediment movement and channel migration across the flats) are maintained.

- **1170 Reefs**
  The conservation objective for the "reefs" feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:

  The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:
  i. the total extent and distribution of *Sabellaria* reef is maintained;
  ii. the community composition of the *Sabellaria* reef is maintained;
  iii. the full range of different age structures of *Sabellaria* reef are present;
  iv. the physical and ecological processes necessary to support *Sabellaria* reef are maintained.

- **1110 Sandbanks which are slightly covered by sea water all the time**
  The conservation objective for the "subtidal sandbanks" feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:

  The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:
  i. the total extent of the subtidal sandbanks within the site is maintained;
  ii. the extent and distribution of the individual subtidal sandbank communities within the site is maintained;
  iii. the community composition of the subtidal sandbank feature within the site is maintained;
  iv. the variety and distribution of sediment types across the subtidal sandbank feature is maintained;
  v. the gross morphology (depth, distribution and profile) of the subtidal sandbank feature within the site is maintained.

- **1099 River lamprey**

The conservation objective for the river lamprey Lampetra fluviatilis feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:

  i. the feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:
  ii. the migratory passage of both adult and juvenile river lamprey through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;
  iii. the size of the river lamprey population in the Severn Estuary and the rivers which drain into it, is at least maintained and is at a level that is sustainable in the long term;
  iv. the abundance of prey species forming the river lamprey's food resource within the estuary, is maintained.
  v. toxic contaminants in the water column and sediment are below levels which would pose a risk to the ecological objectives described above.

- **1095 Sea lamprey**
  The conservation objective for the sea lamprey Petromyzon marinus feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:

  The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:
  i. the migratory passage of both adult and juvenile sea lamprey through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;
  ii. the size of the sea lamprey population in the Severn Estuary and the rivers which drain into it, is at least maintained as is at a level that is sustainable in the long term;
  iii. the abundance of prey species forming the sea lamprey's food resource within the estuary, is maintained.
  iv. toxic contaminants in the water column and sediment are below levels which would pose a risk to the ecological objectives described above.

- **1103 Twaite shad**
  The conservation objective for the twaite Shad Alosa fallax feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:

  The feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:
  i. the migratory passage of both adult and juvenile twaite shad through the Severn Estuary between the Bristol Channel and their spawning rivers is not obstructed or impeded by physical barriers, changes in flows or poor water quality;
  ii. the size of the twaite shad population within the Severn Estuary and the rivers draining into it is at least maintained and is at a level that is sustainable in the long term.
  iii. the abundance of prey species forming the twaite shad's food resource within the estuary, in particular at the salt wedge, is maintained.
  iv. Toxic contaminants in the water column and sediment are below levels which would pose a risk to the ecological objectives described above.

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

The following features and sub-features of the Severn Estuary Severn Estuary SAC have been identified as high risk in relation to towed gear through the application of the Natural England risk matrix:

- **1130 Estuaries (SAC interest feature 1)**
  - High-risk sub-feature: Sabellaria spp. reef
  - High-risk sub-feature: Seagrass
- **1170 Reefs (SAC interest feature 5)**
  - High-risk sub-feature: Sabellaria spp.

Management has been implemented to protect the *Sabellaria* in both the subtidal reef feature and sub-feature of the Estuary feature and intertidal Sabellaria that is described within the Estuarine rock sub-feature of the Estuary. The D&S IFCA Mobile Fishing Permit Byelaw prevents the use of towed gear throughout the whole of the portion of the Severn Estuary which sits within the D&S IFCA's District. The document 'Site Specific Assessment for Red High Risk Categories' (D&S IFCA 2013) covers these actions. Seagrass only occurs in the Welsh portion of the District, so has been screened out of the D&S IFCA's HRA process.

4. Information about the fishing activities within the site

D&S IFCA has carried out a detailed review of the fishing activities taking place within the Severn Estuary EMS (Ross, 2015). D&S IFCA carried out bait digging surveys between 2012 and 2015 and IFCA and a further report specifically focussed on bait digging activity has been produced (West, 2019).

Most of the bait digging effort is focused on sandy and muddy shorelines for *Arenicola marina*. *Allita virens* tends to be targeted in areas of sediment in areas of pebbles or stones. D&S IFCA have not observed any sites where bait digging either occurs on or close to saltmarsh or where trampling of saltmarsh occurs whilst accessing bait digging areas. Furthermore, the Association of Severn Estuary Relevant Authorities (ASERA), in partnership with D&S IFCA, have produced a code of conduct which specifically requests bait diggers to avoid areas of *Sabellaria* reef and saltmarsh which is actively promoted by all ASERA members, including D&S IFCA.

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)	• Abrasion/disturbance of the substrate on the surface of the seabed • Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion • Physical change (to another seabed type) • Removal of non-target species • Removal of target species **See Annex 5 for pressures audit trail**	
3. Is the feature potentially exposed to the pressure(s)?	Yes, there are no current management measures in place so an interaction could occur.	
4. What are the potential effects/impacts of the pressure(s) on the feature, taking into account the exposure level?	If undertaken, bait digging on saltmarsh would cause major damage (Dyrynda 1995). However, this activity does not occur on this habitat so that the potential impacts are not direct (Boorman 2003). Indirect effects are possible through trampling of saltmarsh whilst accessing bait digging areas (Boorman 2003). The effects of trampling will depend on the condition of the saltmarsh, the intensity and frequency and longevity of the disturbance. Low-level chronic trampling of a saltmarsh in Wales over a period of 48 years resulted in increased species and community diversity. Another saltmarsh that was trampled for 17 years had fully recovered 12 years after the disturbance ceased (Headley and Sale 1999). However, in the Severn Estuary bait diggers have direct access to sand and mudflats without having to cross any areas of saltmarsh so trampling is not thought to occur at any of the bait digging areas.	
5. Is the potential scale or magnitude of any effect likely to be significant?	**Alone**	**No**, there is no likelihood of significant adverse effect on the interest features, as a stand-alone project.
	In-combination	**No**
6. Have NE been consulted on this LSE test? If yes, what was NE's advice?	**No**, not at this stage.	

6. Appropriate Assessment

An Appropriate Assessment is not required as the TLSE concluded that this activity would not have a significant effect, either alone or in-combination.

6.1 Potential risks to features

Table 2: Summary of Impacts

Feature/Sub feature(s)	**Conservation Objective**	**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**

7. Conclusion
N/A

8. In-combination assessment
N/A

9. Summary of consultation with Natural England
N/A

10. Integrity test

Conclusion of adverse effect/non-adverse effect either alone or in-combination. This will be reliant on the consideration of mitigation measure(s) documented in the AA and summarised here in conclusion.

Annex 1: Reference list

Boorman, L.A. (2003) Saltmarsh Review. An overview of coastal saltmarshes, their dynamic and sensitivity characteristics for conservation and management. JNCC Report, No. 334

Dyrynda, P. (1995). Impacts of bait dragging on the seabed within Poole Harbour. Report to Southern Sea District Fisheries Committee from the Marine Environmental Research Group, University of Wales, Swansea. Summarised on http://www.ukmarinesac.org.uk/activities/bait-collection/bc19.htm, accessed February 2019.

Headley A.D. and Sale F. (1999) The impact of trampling by student groups on saltmarsh vegetation, Field Studies 9(3): 513-530

Natural England and the Countryside Council for Wales' Conservation Advice – formal advice given under Regulation 33(2)(a) of the Conservation (Natural Habitats, &c.) Regulation 1994, as amended. June 2009.

Natural England (2015) Marine conservation advice for Special Area of Conservation: Severn Estuary (UK0013030)

Natural England's risk assessment Matrix of fishing activities and European habitat features and protected species.

Ross E.J. (2015) Fishing Activities Occurring in the Severn Estuary European Marine Site, Devon and Severn IFCA Report

Ross E.J (2013) Site Specific Assessment for Red High Risk Categories, Severn Estuary SAC. Devon and Severn IFCA

West E.J. (2019) Bait digging in the Severn Estuary European Marine Site, Data Analysis Report. Devon and Severn IFCA.

Annex 2: Natural England's consultation advice

Annex 3: Site Maps

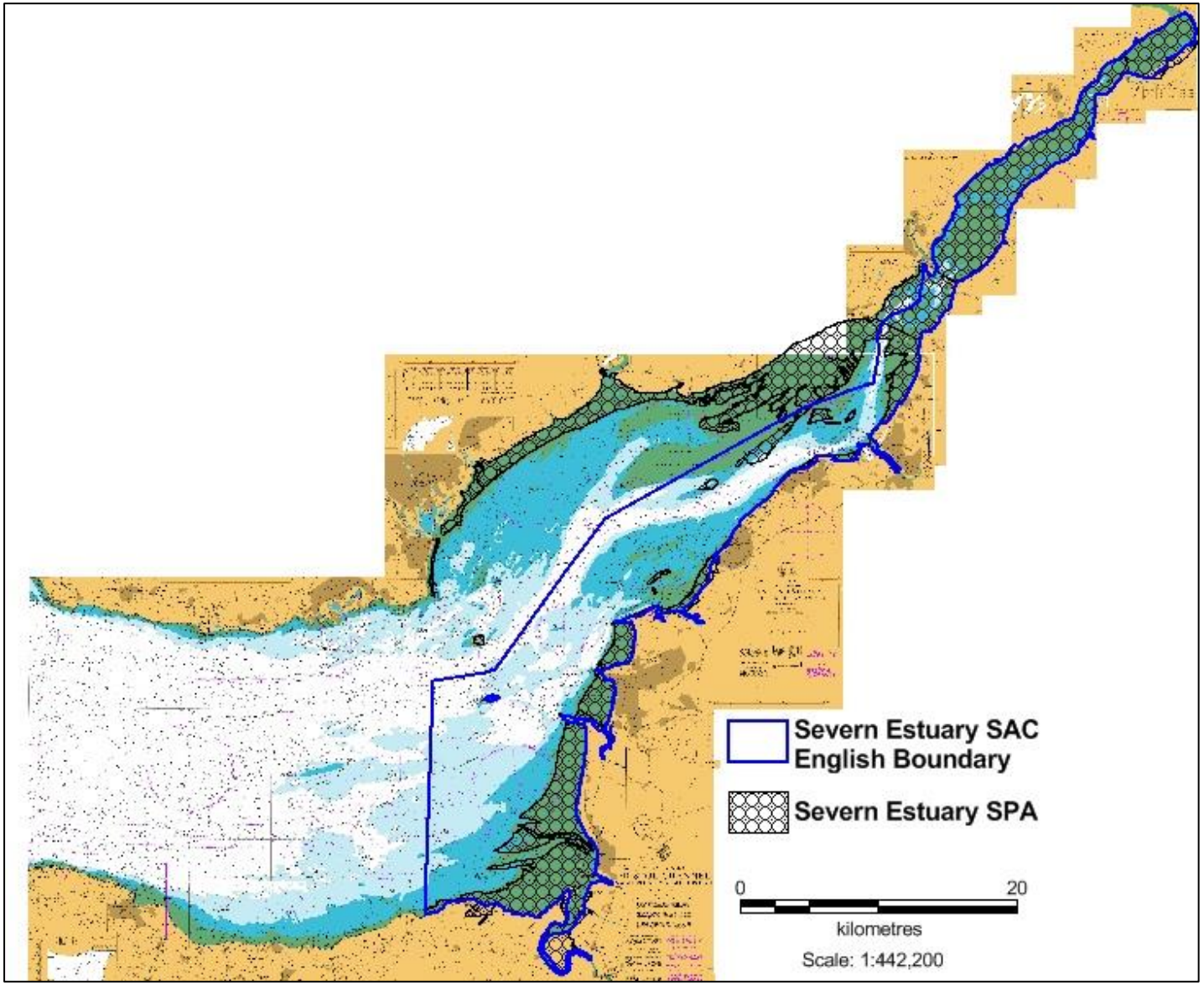


Figure 1 - Map showing the extent of the Severn Estuary SAC

Appendix 5 Map showing the extent of the "Atlantic salt meadow" feature of the Severn Estuary SAC

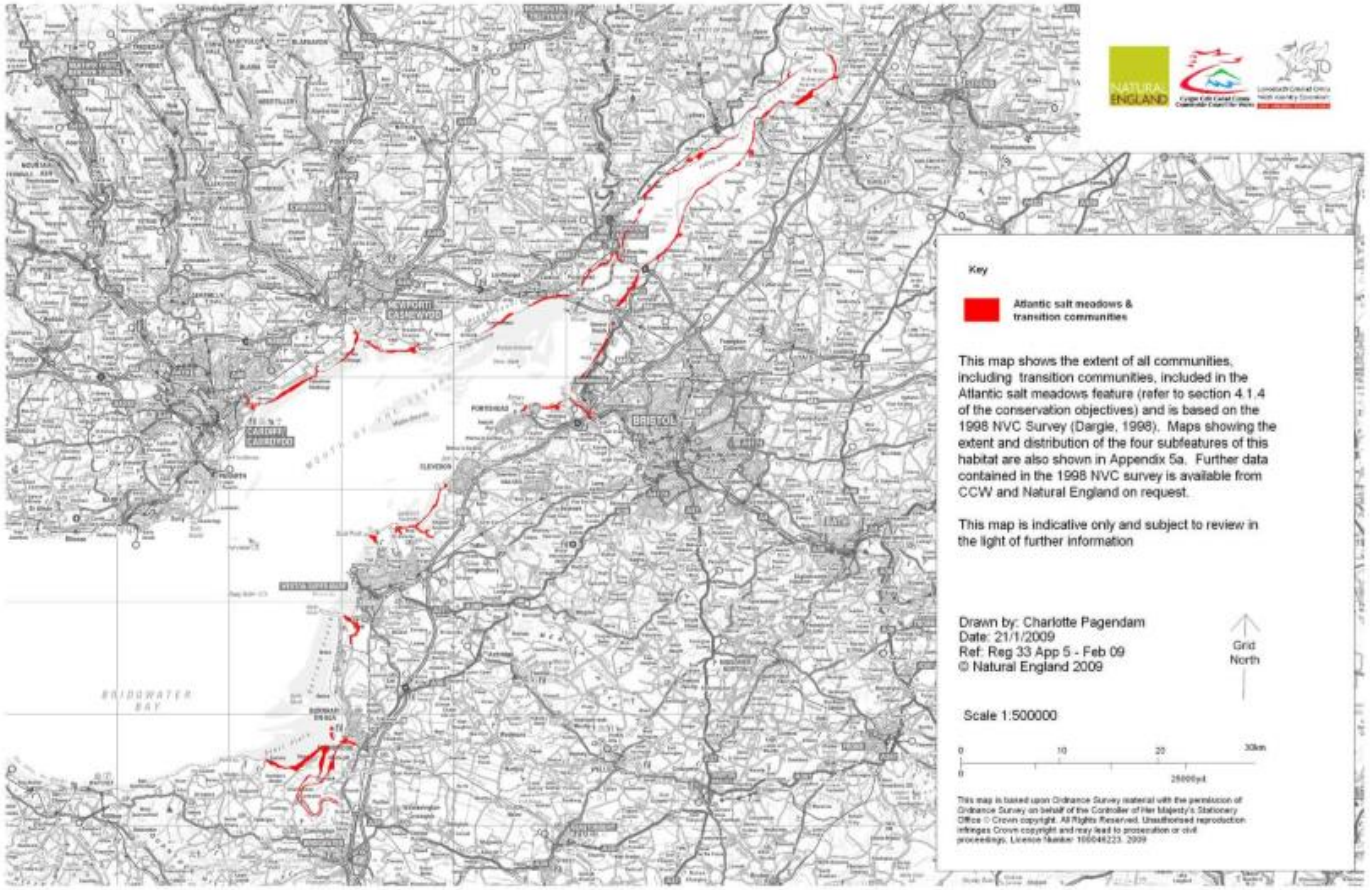


Figure 2. Location of saltmarsh in the Severn Estuary European Marine Site, from the Natural England Regulation 33 Advice.

Annex 4: Fishing Activity Information

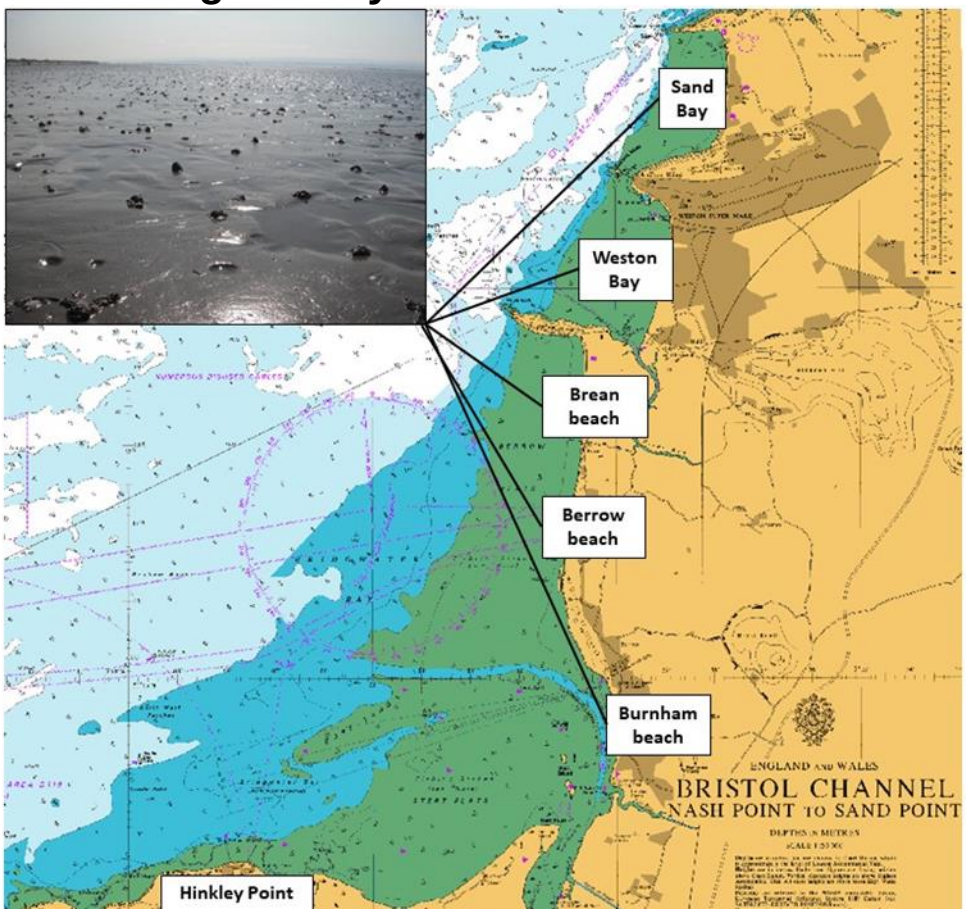


Figure 3. Survey locations for bait digging for lugworm (Weston Bay to Burnham-On-Sea) and ragworm (Hinkley Point) (see West 2019)

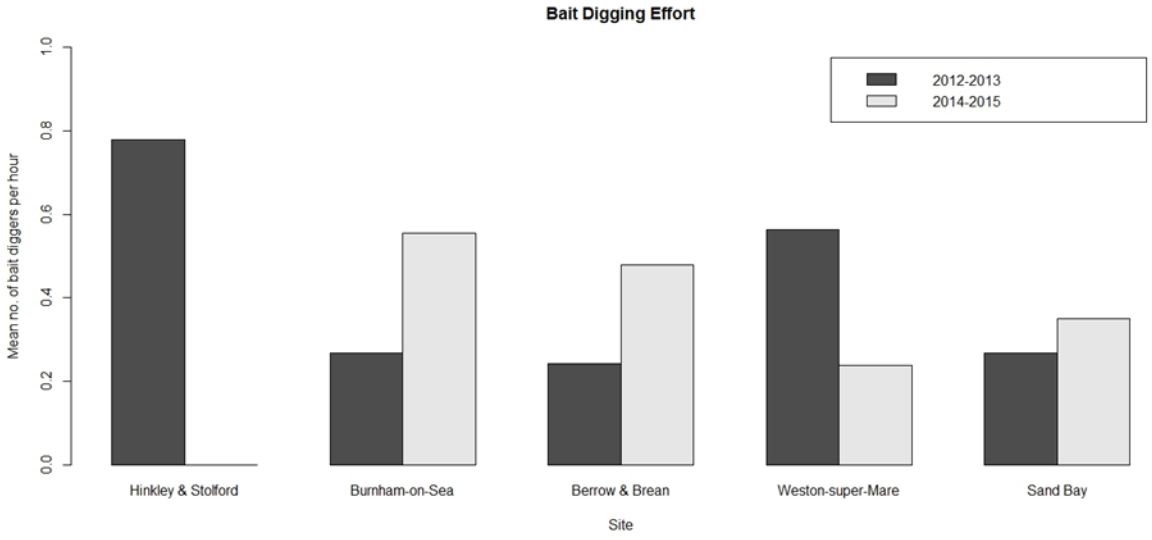
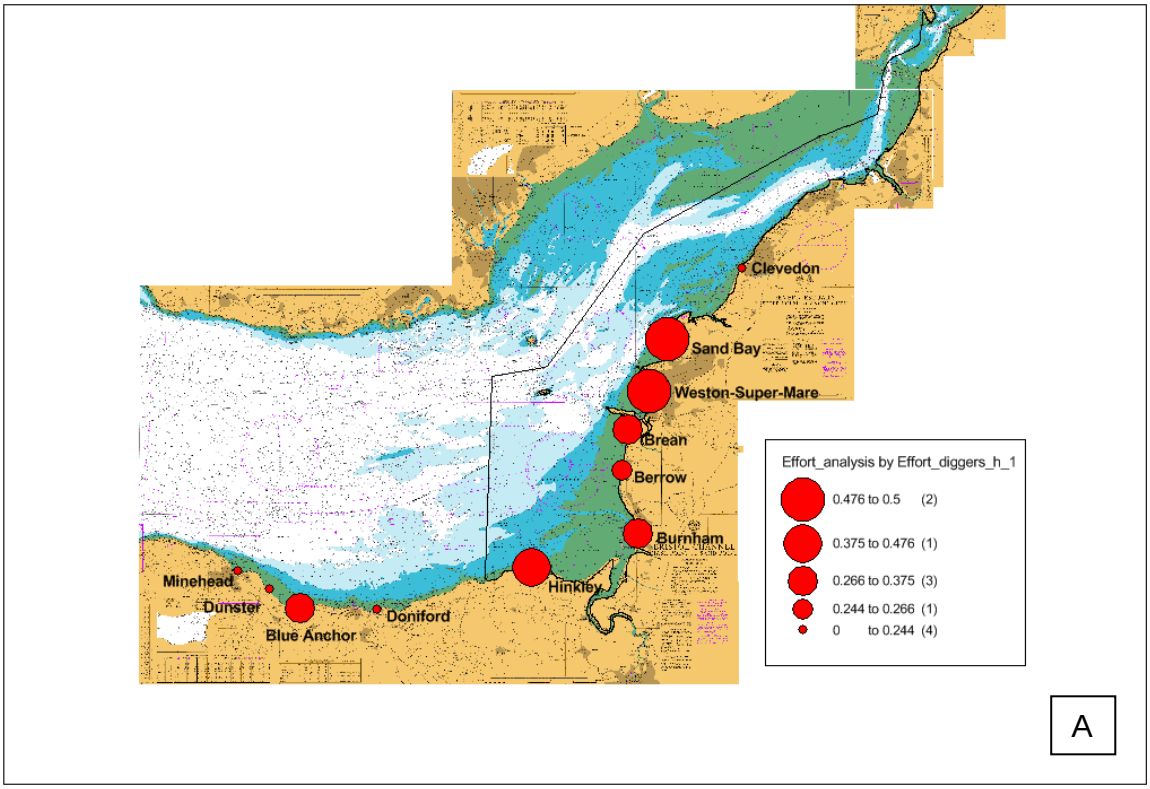


Figure 4. Mean number of bait diggers per hour for both sampling years (see West 2019)



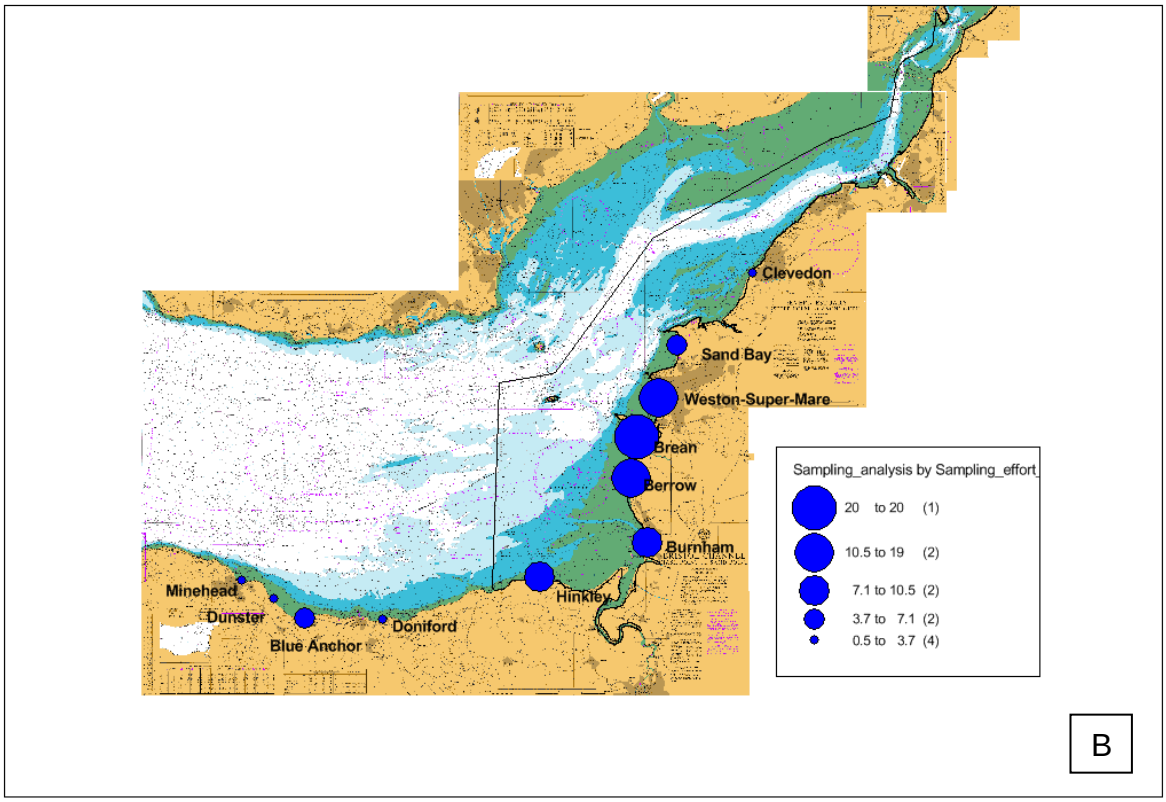


Figure 5 – Survey results 2012-2015, Popularity of different locations in the Severn Estuary for bait digging; A) bait digging intensity (number of bait diggers per sampling hour) and B) sampling effort across the sites.

Annex 5: Pressures Audit Trail

Pressures: Shore-based activities	Atlantic salt meadows	Screening Justification
Abrasion/disturbance of the substrate on the surface of the seabed	S	IN – Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Deoxygenation	NS	OUT - Insufficient activity levels to pose high level of risk
Habitat structure changes- removal of substratum (extraction)	S	OUT - Insufficient activity levels to pose high level of risk
Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	NS	OUT - Insufficient activity levels to pose pollution risk
Introduction of other substances (solid, liquid or gas)	IE	OUT - Insufficient activity levels to pose pollution risk
Introduction or spread of non-indigenous species	S	OUT – Digging occurs in local area only so risk considered extremely low
Litter	IE	OUT - Insufficient activity levels to pose pollution risk
Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	S	IN – Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Physical change (to another seabed type)	S	IN – Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Removal of non-target species		IN – Mortality from trampling
Removal of target species	S	IN – Removal of target species associated with activity & trampling
Siltation rate changes (low)	S	OUT- Insufficient activity levels to pose pollution risk
Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.	NS	OUT- Insufficient activity levels to pose pollution risk
Transition elements & organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	NS	OUT - Insufficient activity levels to pose pollution risk