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

European Marine Site: Plymouth Sound & Estuaries

Fishing activities assessed: Static – pots/traps

Gear/feature interactions assessed:

D&S IFCA Interaction ID	Fishing Activity	Sub-feature(s)/ Supporting Habitat(s)/ Annex I Species
HRA_UK9010141_AO23	SPA Fishtraps	Avocet
		Little egret
HRA_UK9010141_D23		Intertidal seagrass beds
HRA_UK0013111_D23	SAC Fishtraps	Subtidal seagrass beds
		Intertidal seagrass beds

(V.3 Updated December 2017)

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 & Severn Inshore Fisheries and Conservation Authority (D&S IFCA) the fishing activities fishtraps have a likely significant effect on the ‘intertidal seagrass beds’ and ‘subtidal seagrass beds’ of the Plymouth Sound & Estuaries EMS, and on the basis of this assessment whether or not it can be concluded that the fishtraps 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 Plymouth Sound & Estuaries EMS is made up of the Plymouth Sound & Estuaries SAC and the Tamar Estuaries Complex SPA (Figure 1, Annex 3). Plymouth Sound and its associated tributaries comprise a complex site of marine inlets. The ria systems entering Plymouth Sound (St John's Lake and parts of the Tavy, Tamar and Lynher), the large bay of the Sound itself, Wembury Bay, and the ria of the River Yealm are of international marine conservation importance because of their wide variety of salinity conditions and sedimentary and reef habitats. The high diversity of habitats and conditions gives rise to communities both representative of ria systems, and some very unusual features, including abundant southern Mediterranean-Atlantic species rarely found in Britain (English Nature, 2000). This site crosses the border between Devon & Severn IFCA and Cornwall IFCA.

2.1 Overview and qualifying features

Plymouth Sound and Estuaries qualifies as a SAC for the following Annex I habitats as listed in the EU Habitats Directive (Natural England, 2015a):

- Large shallow inlets and bays, the key sub-features are:
    - Intertidal rock
    - Circalittoral rock
    - Infralittoral rock
    - Subtidal mud
    - Subtidal sand
    - Subtidal seagrass beds
- Estuaries, the key sub-features are:
    - Circalittoral rock
    - Infralittoral rock
    - Intertidal mixed sediment
    - Intertidal mud
    - Intertidal rock
    - Intertidal seagrass beds
    - Lower-mid saltmarsh
    - Mid-upper saltmarsh
    - Pioneer saltmarsh
    - Subtidal mixed sediments
    - Subtidal mud
    - Subtidal sand
    - Subtidal seagrass beds
    - Transition & driftline saltmarsh
    - Upper saltmarsh
- Sandbanks which are slightly covered by seawater all the time, the key sub-features are:
    - Subtidal coarse sediment
    - Subtidal mixed sediment
    - Subtidal mud
    - Subtidal sand
    - Subtidal seagrass beds
- Atlantic salt meadows
- Mudflats & sandflats not covered by seawater at low tide, the key sub-features are:
    - Intertidal coarse sediment
    - Intertidal mixed sediments
    - Intertidal mud
    - Intertidal sand & muddy sand
    - Intertidal seagrass beds

- Reefs
    - Circalittoral rock
    - Infralittoral rock
    - Intertidal rock

Plymouth Sound and Estuaries qualifies as a SAC for the following Annex II species as listed in the EU Habitats Directive (Natural England, 2015a):

- Allis shad (*Alosa alosa*)
- Shore dock (*Rumex rupestris*)

The Tamar Estuaries Complex qualifies as a SPA under the Birds Directive for (Natural England, 2015b):

- Nationally important populations of regularly occurring Annex 1 species, Avocets (*Recurvirostra avosetta*) and Little egrets (*Egretta garzetta*), the key supporting habitats are:
    - Annual vegetation of driftlines
    - Coastal reedbeds
    - Freshwater & coastal grazing marsh
    - Intertidal mixed sediments
    - Intertidal mud
    - Intertidal sand & muddy sand
    - Intertidal seagrass beds
    - Water column
    - Saltmarsh

2.2 Conservation Objectives

The site's conservation objectives which apply to the **Special Area of Conservation** and the natural habitat and/or species for which the site has been designated 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 Favourable Conservation Status of its qualifying features, by maintaining or restoring:

- the extent and distribution of qualifying natural habitats and habitats of the qualifying species
- the structure and function (including typical species) of qualifying natural habitats
- the structure and function of the habitats of qualifying species
- the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- the populations of qualifying species
- the distribution of qualifying species within the site

The site's conservation objectives which apply to the **Special Protection Area** and the individual species and/or assemblage of species for which the site has been classified 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) (if applicable)

- Subtidal rock and reef communities were categorised as "red" risk against all demersal towed gear and towed dredges. In January 2014 D&S IFCA introduced the Mobile Fishing Permit Byelaw, which prohibits the use of towed gear within this EMS (Map Annex 5).
- Seagrass bed communities were categorised as "red" risk against towed demersal gear, dredges, intertidal handwork, crab tiling, and digging with forks. At that time, only subtidal seagrass beds were considered as a sub-feature of the site which would not be exposed to intertidal handwork, crab tiling or digging with forks. In January 2014 D&S IFCA introduced the Mobile Fishing Permit Byelaw, which prohibits the use of towed gear within this EMS (Map Annex 5).

4. Information about the fishing activities within the site

Fish traps are occurring in Plymouth Sound SAC. An emergent fishery for wild wrasse is developing in Plymouth for use as cleaner fish in salmon aquaculture in Scotland. The species targeted are four out of the five that are common in the south west: Ballan (*Labrus bergylta*), Goldsinny (*Ctenolabrus rupestris*), Corkwing (*Symphodus melops*) and Rock Cook (*Centrolabrus exoletus*). The fishery is thought to have begun in Plymouth around March 2015 and Devon and Severn IFCA were informed of the fishery by Cornwall IFCA in September 2016. There are four known vessels which currently fish for wrasse in D&S IFCAs District. The fishery operates between March and November. The parlour pots used are specifically deigned to catch wrasse (Figure 1), which are lightweight (3.7kg) and fitted with wrasse escape gaps. They measure 72Lx40Wx28H.

Figure 1 – Wrasse pot used by fisherman ©D.Cresswell

In 2016 and the beginning of 2017 the four vessels had 120-200 pots each. The vessels' sizes range from 5m to up to 8m and work to depths of 12m maximum. They mostly work within Plymouth Sound, south of the breakwater and along the shore from Mount Batten Breakwater down to the Mew Stone (see Figure 8 to Figure 11 for areas fished per vessel). Three of these vessels also fish within Cornwall IFCA District from Fort Picklecombe to Rame Head. There is a fifth vessel which began fishing this summer (2017) but it is only working on the Cornish side. Detailed information on the wrasse fishery can be seen in the PDF attached at the end of Section 4 (Page 9).

Devon & Severn IFCA undertook a survey within the SAC in May 2016 (prior to the wrasse fishery becoming known to the Authority) to determine the level of activity occurring (Annex 4, Figure 6). A total of 24 buoys/bottles were unmarked and of this, seven located near Batten Bay were thought to be no longer active as were covered with seaweed and five were located outside the SAC. Commercial vessel three (Annex 4, Figure 6) was seen potting within the SAC using similar unmarked bottles to those found in the area. However, the vessels fishing for wrasse did not have potting permits at the time and therefore the unmarked buoys may have belonged to them.

A literature review and desk top research of wrasse and live wrasse fisheries was undertaken in late 2016/early 2017 (see embedded document) and the findings were reported to the D&S IFCA Byelaw and Permitting Sub-committee. The sub-committee considered options for monument of the Live Wrasse Pot Fishery and on 24th February 2017 Devon and Severn IFCA went out to consultation on a review of the Potting Permit Byelaw permit conditions to include management of the Live Wrasse Fishery within the IFCA district.

A review of wrasse ecology and fisherie

4.1 Management

Five initial management measures were considered and consulted on, these are listed below:

1. **Fully Documented Fishery**

   Under Paragraph 17 of the Potting Permit Byelaw, those permit holders who wish to engage in the live wrasse pot fishery will be required to provide relevant fishery information to the Authority. This information will be provided in two formats:

   a. Permit holders will provide fisheries data through daily logbooks, to include the following information:
      a. Date and time of deployment and recovery of each string
      b. Start and end latitude and longitude of each string of pots hauled
      c. Number of strings fished
      d. Number of pots per string
      e. Number of times per day pots are hauled
      f. Number of each species of wrasse retained on board
      g. Number of live wrasse supplied direct to Salmon Farm Industry/Agent

   b. D&S IFCA officers will undertake on board catch surveys on a regular basis to observe the total catches. Fishermen will enable this data collection by allowing D&S IFCA officer on board their vessels.

2. **Pot Limitations**

A limit on the number of pots per vessel should be set at 60 pots

3. **Marking of gear**

   a. Every pot used for the capture of live wrasse must be marked with a tag that is issued by D&S IFCA, to allow for identification of the wrasse pots and aid compliance of the effort restrictions.

   b. All strings of wrasse pots to be used to capture live wrasse must be marked with a buoy or dahn, and each buoy or dahn must be marked the letter 'W' together with the vessels PLN. This is for identification purposes to differentiate wrasse pots from other potting gear used for the capture of Crustacea and Molluscs.

   c. Strings of pots used for the capture of live wrasse must be used solely for that purpose.

4. **Closed Season**
The period between 1st April and 31st July will be closed to the live wrasse pot fishery.

5. **Minimum and maximum conservation reference sizes**

Species of Wrasse	Minimum Conservation Reference Size mm	Maximum Conservation Reference Size mm
Rock Cook	120	230
Goldsinny	120	230
Corkwing	120	230
Ballan	150	230
Cuckoo	150	230

The deadline for responses was 7th April 2017. IFCA officers collated responses and produced an impact assessment on the proposed management measures. The Byelaw and Permitting Sub-Committee met on 15th May 2017 and recommended that the Full Authority consider and agree the revised proposals. The Full Authority approved the recommendations on 15th June 2017 and these were introduced to the live wrasse pot fishery for the remainder of the 2017 season, through changes to the Potting Permit conditions**.** Amended permits were circulated in July 2017. The new conditions are as follows:

Management Measures:

- To have a fully documented Live Wrasse Fishery
- To limit the number of pots used by each vessel in the Live Wrasse Fishery to 120 pot limit per permit holder
- To mark all strings of pots used in the Live Wrasse Fishery with 'WRA' and Vessel's PLN
- To mark each pot used in the Live Wrasse Fishery with a tag supplied by D&S IFCA
- To have a closed season from 1st April to 30th June
- To introduce minimum and maximum conservation reference sizes for five species of wrasse:
    - Ballan and cuckoo wrasse less than 150mm or greater than 230mm
    - Corkwing, rock cook and goldsinny wrasse less than 120mm or greater than 230mm

Under Paragraph 17 of the Potting Permit Byelaw, D&S IFCA can request relevant information to discharge its duties. In order to manage the Live Wrasse Fishery and as part of the fully documented fishery the following information is required:

1. The name and contact details of the Salmon Farm company, agent or associated company who the fishermen are supplying live wrasse to.
2. Name and contact details of transport company.
3. Transport documents for all those consignments sent to the Salmon Farm company.
4. Number of pots actively being used in the Live Wrasse Fishery.
5. Completion of weekly returns including information on the dates and times of hauling, location of strings, number of strings hauled, number of pots hauled, and the number of wrasse retained on board per day.

Other requirements:
Fishermen will also be required to allow D&S IFCA officers on board their vessels to collect catch data for the fishery.

Management Review Process:

- The Authority has decided that if there is an increase in the number of vessels entering the Live Wrasse Fishery this will trigger a review of the permit conditions for the Live Wrasse

Fishery, and may lead to further changes to the permit conditions, which may include a reduction in the number of pots per vessel.
- The Authority has decided that a review of the management of the Live Wrasse Fishery will be undertaken in November 2017. Data collected from fishermen and on-board surveys will inform the review of the permit conditions for the Live Wrasse Fishery, and may lead to changes to these conditions.
- Failure to meet all conditions set out in this policy statement may also trigger a review of the permit conditions.
- In addition to formal management under the Potting Permit conditions, the Authority may introduce further voluntary measures to support the management of the Live Wrasse Fishery. Failure to adhere to these voluntary measures may lead to a review of the permit conditions.

Guidance for the Live Wrasse Fishery:
Further to the regulatory conditions, D&S IFCA has developed additional guidance to support these measures and the fishery. This guidance is in the form of voluntary measures to be adopted by those fishermen participating in the Live Wrasse Fishery.

1. A series of small closed zones to the live wrasse pot fishery or 'No Wrasse Pot Zones' have been identified through discussions with the fishermen. These areas lie within the fishery area in the Plymouth Sound and associated area and include reef habitat known to be favoured by the wrasse species fished. Figure 7 (Annex 4) shows the areas closed to the Live Wrasse Fishery.
2. Mount Batten Breakwater is known to be a popular angling mark and in order to remove any conflict with anglers in this area, fishermen are requested to keep their pots 30m from the pier.

4.2 Data Analysis
In November 2017 a report on the analysis of the wrasse fishery data collected from on-board surveys and returns data from the fishermen (see link to PDF below) was presented to the Byelaw and Permitting Sub-Committee on 13th November 2017. At this meeting, the Byelaw and Permitting Sub-Committee recommended proposed changes to management measures for the Live Wrasse Fishery. D&S IFCA is going out to consultation to amend the current permit conditions. The recommended changes are:

- **to amend the slot size for corkwing to 140mm to 180mm**
- **to change the closed season to May 1st to 15th July.**

Live Wrasse Fishery
Data Analysis Noveml

The Byelaw and Permitting Sub-committee suggested further monitoring of the areas where the fishermen are shooting and hauling their pots to demonstrate adherence to the voluntary closed areas. This may involve putting GPS locators on the vessels to monitor the vessel movements. This will be discussed as a voluntary measure with the fishermen involved in the fishery.

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

5. Test for Likely Significant Effect (LSE)

5.1 Table 1: Assessment of LSE

<table>
<tr><td>1. Is the activity/activities directly connected with or necessary to the management of the site for nature conservation?</td><td colspan="2">No</td></tr>
<tr><td>2. What pressures (such as abrasion, disturbance) are potentially exerted by the gear type(s)</td><td colspan="2">SAC
Abrasion/disturbance of the substrate on the surface of the seabed
Removal of non-target species
Removal of target species
SPA
Above water noise
Abrasion/disturbance of the substrate on the surface of the seabed
Removal of non-target species
Removal of target species
Visual disturbance
See Annex 6 for pressures audit trail</td></tr>
<tr><td>3. Is the feature potentially exposed to the pressure(s)?</td><td colspan="2">Yes, D&S IFCA has a potting permit byelaw and through this can gauge where any future changes or developments in this activity occur within Plymouth Sound and Estuaries EMS. D&S IFCA has brought in management measures for the wrasse fishery (see section 4). The Dockyard Port of Plymouth Order 1999 prohibits fishing in some areas of the SAC.</td></tr>
<tr><td>4. What are the potential effects/impacts of the pressure(s) on the feature, taking into account the exposure level?</td><td colspan="2">Four commercial vessels are known to pot for wrasse within the SAC. Potting for wrasse generally occurs on rocky reef and seaweed covered areas. Disturbance and abrasion of the substrate could occur from landing of deployed pots on the seabed and movement/recovery of the pots (Coleman et al. 2013).
It is unlikely that potting would occur in the intertidal seagrass of the SAC and SPA beds in the future. Consequently, disturbance to birds and impact on supporting habitats is thought to be negligible.</td></tr>
<tr><td rowspan="2">5. Is the potential scale or magnitude of any effect likely to be significant?</td><td>Alone</td><td>No interaction is present for pots and intertidal seagrass beds.
Unsure, pots have the potential to impact subtidal seagrass beds.</td></tr>
<tr><td>In-combination</td><td>See section 8 for more information.</td></tr>
<tr><td>6. Have NE been consulted on this LSE test? If yes, what was NE’s advice?</td><td colspan="2">No, not at this stage.</td></tr>
</table>

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/ Sub feature(s)	Target Attributes/ Conservation Objectives (Natural England, 2015a)	Potential pressure exerted by gear type(s)	Potential ecological impacts of pressure exerted by the activity/activities on the feature	Level of exposure of feature to pressure	Mitigation measures
Estuaries; Large shallow inlets and bays; Mudflats and sandflats; Sandbanks • Subtidal seagrass beds	**Target Attribute:** **1.** Maintain the total extent of seagrass beds at 34.6 ha and spatial distribution as defined. **Conservation Objective:** **1.** Maintain or restore the extent and distribution of qualifying natural habitats of the qualifying species. **Target Attribute:** **2.** Maintain the leaf/ shoot density, length, percentage cover, and rhizome mat across the feature at natural levels (as far as possible), to ensure a healthy, resilient habitat. **Conservation Objective:** **2.** Maintain or	• Abrasion/ disturbance of the substrate on the surface of the seabed	Benthic communities are thought to be relatively unaffected by static gear due to the footprint of the gear and the small area of the seabed in direct contact (Eno *et al.* 2001). Disturbance and abrasion of the substrate could occur from landing of deployed pots on the seabed and movement/recovery of the pots (Coleman *et al.* 2013). Walmsley et al (2015) reviewed literature of potting impacts and found there is currently no primary literature on the impact of potting on seagrass beds. However, studies have been conducted on the impacts of anchoring and mooring on seagrass beds. An anchor landing on a patch of seagrass can bend, damage and break shoots (Montefalcone *et al.* 2004). Collins *et al.* (2010) studied the impacts of anchoring on *Zostera marina* in Studland Bay, Dorset. Sediment in bare patches from anchoring and mooring chain damage was less cohesive and more mobile. It contained less organic material and had a lower silt fraction (Collins *et al.* 2010). Collins *et al.* (2010) stated that when an anchor and chain is pulled up and dragged over the bottom following the movement of the boat it cuts leaves and pulls the rhizomes from the seabed. It cuts into the seagrass rhizome mat, tearing a hole in its fabric. This forms an anchor scar and damage is elevated by	Four commercial vessels are known to pot for wrasse within the SAC in D&S IFCA District. Wrasse are generally targeted on the infralittoral rock sub-feature. Figure 8 to Figure 12 show the location of fishing effort. Although wrasse are targeted on infralittoral rock, potting for wrasse may occur near seagrass beds as vessel 2 operates in grids that contain seagrass (Figure 9). The fishery operates between March and November (except in bad weather). D&S IFCA has implemented a closed spawning season between 1st April and 30th June. A fully documented fishery will allow the IFCA to understand the level of effort and exact location of where the potting for wrasse occurs throughout the year.	Activity levels need to be monitored and alongside patrols, the Potting Permit Byelaw can gauge where any future changes or developments may occur. Changes can be made to the permit conditions, via consultation, if the D&S IFCA deems it to be necessary. The permitting system allows for adaptive management. D&S IFCA has introduced

	Restore the structure and function (including typical species) of qualifying natural habitats.		wave action. Additionally, shore crabs *Carcinus maenas* occupy burrows beneath the seagrass rhizomes which, alongside wave action undermine the edge (which can be 10-20cm deep) of the surviving seagrass (Collins *et al.* 2010). Chains attached to anchors from moored boats leave bare patches, typically 1-4m² (Collins *et al* 2010). Impacts from pots would be from the end weights attached to the surface marker. The weights used for pots are thought to have less of an impact than anchors used for mooring, as they do not penetrate into the seabed and dislodge seagrass rhizomes. It is considered that lobster pots consistently set and hauled in a seagrass bed can cause damage by leaf shearing, damaging meristems, uprooting plants and, if left long enough on the bottom can cause damage by smothering and light attenuation (Roberts *et al.* 2010). However, the traps used to catch wrasse are lightweight (3.7kg) compared to lobster pots. Eno *et al*. (2001) and Coleman *et al.* (2013) undertook studies on the impact of potting on reef feature. They concluded epifaunal assemblages suffered little impact from pots and traps and could be considered generally insensitive to commercial potting. An officer from D&S IFCA was present during a survey with Cornwall IFCA to look at the impacts of potting on seagrass beds. Cameras were attached to a string of six parlour pots using wooden poles. The angle of the cameras gave a frame of view over the potential impact zones of the pot when hauling. These included the front and back of the pot. Once landed, pots were on the seabed for approximately 5 minutes and during this time, there was limited to no movement seen on the seabed until hauling. The front of the pot appeared to cause no physical damage to the seagrass when hauling as the pot lifted directly up	Weekly returns are received from the fishermen and transport documents from each landing. The data from logs books and on board surveys include catch composition by species, size distribution and determine size at sexual maturity and allow for catch per unit effort (CPUE) to be determined. This together with landings PUE will help inform assessment of stock abundance and highlight changes over time. The introduction of a slot size (min. & max. conservation reference sizes) for all five species will allow the larger fish (namely for ballan) to remain in the population so affording protection to the breeding stock. The minimum size will allow most individuals to spawn before being removed. The closed spawning season will allow species to spawn a least once before being harvested and allow nests to be protected. Triggers that would initiate a review of management are likely to include: 1) Any increase in effort (number of boats). 2) Failure to meet all permit	permit conditions under the Potting Permit Byelaw for the management of the Live Wrasse Fishery (see section 4).

			from the front, off the seagrass bed. As the pot lifted, the rear-view camera footage showed that the seagrass underneath the pot appeared to be flattened (Davies, pers. obvs.). Sediment could be seen dispersing into the water column from the movement of the pot during hauling. When the seagrass was flattened by the pot, it was seen to lift again. Observations were made from reviewing the footage on the boat. The video showed leaves being removed from the seabed and floating free (Jenkin *et al.* 2017). Blades of seagrass were caught on an area of skirt of one pot that was sticking out (Jenkin *et al.* 2017). In addition, an observation was made that the pots glided over the seagrass as it was hauled and not dragged through it (C. Trundle, pers. comms). The survey was carried out as a worst case scenario, with lobster pots on seagrass (up to 70cm long) near Falmouth. As the survey was conducted in November when the seagrass is dying back and may be more susceptible to becoming detached. Hauling speed was slow and carried out on a large vessel, with the hauler further back from the bow, when compared to fishing vessels.	conditions. 3) Failure to adhere to voluntary closed areas. 4) On board surveys identify over half the proportion of the spawning season not protected. 5) A significant decrease in CPUE. 6) A shift in size distribution. Data collected from fishermen and on-board surveys will inform the review of the permit conditions. Detailed information on the wrasse fishery can be seen in the PDF attached at the end of Section 4 (Page 9). There is no literature on the impact of wrasse pots or fish traps on seagrass beds. The traps used to catch wrasse are lightweight (3.7kg), specially designed parlour pots (Figure 1). The maximum depth (below chart datum) of seagrass beds recorded in Plymouth Sound SAC (Curtis, 2012) are: • Drakes Island ~5m • Tomb Rock ~4.5m • Cellars Cove ~2m • Red Coves (North & South) ~3m	

				• Jennycliff North ~1m • Jennycliff South ~5.5m • Firestone Bay ~2m Walmsley et al (2015) sensitivity assessments for seagrass are: a high sensitivity to heavy levels of potting activity, medium sensitivity to moderate and low levels of potting, and low sensitivity to single potting usage (Hall *et al.* 2008).	
Estuaries; Large shallow inlets and bays; Mudflats and sandflats; Sandbanks • Subtidal seagrass beds	**Target Attribute:** **3.** Maintain the area of habitat which is likely to support the sub-feature. **Conservation Objective:** **3.** Maintain or restore the extent and distribution of qualifying natural habitats of the qualifying species.	• Abrasion/ disturbance of the substrate on the surface of the seabed	*Zostera* can colonise a wide variety of sediments. All subtidal seagrass beds within the site are A5.5331 *'Zostera marina/ angustifolia* beds on lower shore or infralittoral clean or muddy sand'. Potting would not alter the extent or area of the habitat that is likely to support subtidal seagrass beds.	No exposure from potting activities	No mitigation necessary
Estuaries; Large shallow inlets and bays; Mudflats and sandflats; Sandbanks • Subtidal seagrass	**Target Attribute:** **4.** Maintain the presence and spatial distribution of intertidal & subtidal seagrass bed communities **Conservation Objective:**	• Abrasion/ disturbance of the substrate on the surface of the seabed	Benthic communities are thought to be relatively unaffected by static gear due to the footprint of the gear and the small area of the seabed in direct contact (Eno *et al.* 2001). All subtidal seagrass beds within the site are A5.5331 *'Zostera marina/angustifolia* beds on lower shore or infralittoral clean or muddy sand'.	See above (page 11)	See above (page 11)

beds	**4.** Maintain or restore the extent and distribution of qualifying natural habitats of the qualifying species. **Target Attribute:** **5.** Maintain the species composition of component communities. **Conservation Objective:** **5.** Maintain or Restore the structure and function (including typical species) of qualifying natural habitats.		No literature on the specific impacts of pots on seagrass habitats was found. However, studies have been conducted on the impacts of anchoring and mooring on seagrass beds. Collins *et al.* (2010) studied the impacts of anchoring on *Zostera marina* in Studland Bay, Dorset. Sediment cores showed a higher abundance in the seagrass compared to the anchor and mooring scars (total fauna count of seagrass to scar ratio was 1134:339). The diversity of taxa was also higher in seagrass compared to scar areas, with 50 and 38 families/species, respectively, found in their samples. Overall, the infauna was dominated by polychaetes, oligochaetes, bivalves, and amphipods (Collins *et al.* 2010). Reed and Hovel (2006) investigated how the degree of *Zostera marina* loss influenced the abundance, diversity, and community composition of epifauna within experimental seagrass plots in San Diego Bay, California, USA. Seagrass habitat was removed to replicate scarring and plots were sampled eight weeks after. No correlation was seen between seagrass loss and epifaunal species richness, total epifaunal density or epifaunal diversity for small plots ($4m^2$). In large plots ($16m^2$) with 90% habitat removal, there was significantly lower epifaunal species richness and total epifaunal diversity than plots with 0, 10 or 50% habitat removal.		
Estuaries; Large shallow inlets and bays; Mudflats and sandflats; Sandbanks • Subtidal seagrass	**Target Attribute:** **6.** Maintain the presence and spatial distribution of intertidal & subtidal seagrass bed communities **Conservation Objective:**	• Removal of target species • Removal of non-target species	<u>**Target species:**</u> A direct effect of wrasse potting includes the removal of the target species: ballan (*Labrus bergylta*), goldsinny (*Ctenolabrus rupestris*), corkwing (*Symphodus melops*) and rock cook (*Centrolabrus exoletus*). Cuckoo wrasse (*Labrus mixtus*) are not targeted in the District and are returned to the sea alive if caught. The five species of wrasse generally live among rocky and seaweed covered areas inshore	See above (page 11)	See above (page 11)

beds	**6.** Maintain or Restore the extent and distribution of qualifying natural habitats of the qualifying species. **Target Attribute:** **7.** Maintain the species composition of component communities. **Conservation Objective:** **7.** Maintain or Restore the structure and function (including typical species) of qualifying natural habitats.		and seagrass beds. Their diet mainly consists of molluscs, crustaceans and barnacles. The five species of wrasse have relatively different life history strategies. The two larger species, ballan and cuckoo are protogynous hermaphrodites, which means they are born females and some change their sex to male later in life. Sexual inversion depends on the proportion of the sexes in local populations and most populations tend to have more females than males (Naylor, 2005). In ballan wrasse, a male guards a harem of females (Darwall *et al.* 1992). Apart from goldsinny which have planktonic eggs, wrasse have sticky benthic eggs deposited in nests guarded by the males (Darwall *et al.* 1992). In goldsinny and corkwing wrasse, non-territorial, but mature 'sneaker' males which mimic the female phenotype steal fertilisation of eggs in territorial male's nests (Darwall *et al*. 1992). Wrasse stocks and their biology in the UK are poorly understood and whilst there has been some limited research in the past, currently no stock assessment exists. **Biology:** ***Population structure:*** The minimum size for use in salmon cages is 12cm so the removal of larger (>12cm) fish can alter population structures (Darwall *et al.* 1992). For goldsinny and corkwing, the population may be ensured due to enabling some spawning before removal as <12cm fish are returned, and size at maturity is ~10cm. However, due to the mature species being targeted the average size and age at first maturity would be expected to decrease over time (Darwall *et al.* 1992). For larger species, such as the ballan and cuckoo wrasse, their size at sexual maturity is higher than 12cm (ballan: females 16-18cm, males 28cm; cuckoo: females 16cm and males 24cm) so individuals are		

			removed before having a chance to spawn. The industry requires certain sizes of the different species related to their efficiency in cleaning. In the beginning of the fishery, there were industry led voluntary size limits such as >22cm as larger species tend to become too aggressive in cages (Cornwall IFCA 2016, pers. comms.). In ballan wrasse, two distinct colour patterns (morphotypes) have been reported: spotted and plain. They coexist in sympatry and are not related to sexual dimorphism. These two types have different life history strategies, in growth and maturation (Villegas-Rios *et al.* 2013a), which raises the question of whether they represent one or two different taxonomic species. Alamada *et al.* (2016) found analyses of mitochondrial and nuclear markers revealed no genetic differences between the morphotypes in wrasse samples from Norway, North Spain, Portugal and the Azores. However, Quintela *et al.* (2016) used microsatellite markers for a genetic analysis of plain and spotted wrasse in Galicia (northwest Spain) and concluded there was significant genetic heterogeneity within the species, which appears to be highly associated with the two forms, but not completely explained by them. Spotted individuals are under stronger selective pressure from fisheries because they attain larger mean sizes, and as a result have lower reproductive output, and unbalanced sex ratios due to male-biased overexploitation may occur since the ballan wrasse is a protogynous hermaphrodite (Almada *et al.* 2016; Villegas-Rios *et al.* 2013a). As a precautionary measure, it is recommended that plain and spotted morphotypes should be considered two independent management units (Almada *et al.* 2016). There is some information available regarding wrasse		

			fisheries in other locations. Darwall *et al.* (1992) and Deady *et al.* (1993) looked at the impact of the first two years of a wrasse fishery in Mulroy Bay and Lettercallow Bay, Ireland. Catch Per Unit Effort (CPUE) decreased and was significantly lower in the second year, there was also a lower percentage frequency of larger wrasse and a reduction of corkwing males greater than 13cm in the second year. Halvorsen *et al.* (2016b) found corkwing males attained larger sizes compared to females and sneaker males and there was a higher capture probability for males, resulting in sex-selective harvesting. Additionally, there was a difference in growth between north and southern populations and the minimum size of 12cm in Norway failed to protect any mature nesting males in five out of eight populations (Halvorsen *et al.* 2016b). ***Social structure:*** The fishery could alter social structures through the removal of large males and subsequently change the sex ratios. Wrasse are highly territorial, occupying small spatial areas (Villegas-Rios *et al.* 2013b). Wrasse also have dominance hierarchies, and males have been found to grow faster, attain larger sizes and have a higher capture probability (Halvorsen *et al*. 2016c). The removal of large males may alter the social structures and subsequently change sex ratios within the population. There is also an unknown impact the removal of large, territorial males will have on sneaker males; either decrease in numbers due to the removal of social inhibition for dominant status or increase in numbers through increased spawning success (Darwall *et al.* 1992). ***Spawning season:*** The need for wrasse in salmon production coincides with the spawning season of wrasse (Skiftesvik *et al*. 2015) which ranges from April through to September		

			depending on the species. The removal of a significant amount of wrasse within this period would reduce spawning and egg production. Once eggs are laid in a nest, they may take up to 16 days to hatch (Potts, 1974) and during this period the male guards the nest. So the removal of nest guarding males may reduce egg survival (Darwall *et al.* 1992). ***Genetics:*** Additionally, it is likely that local populations are genetically isolated and removal would affect stock structure (Skiftesvik *et al.* 2014). Recorded home ranges of wrasse have been 91m² for ballan (Villegas-Rios *et al.* 2013b), territories of up to 2m² for goldsinny (Hillden, 1981) and >15m² for corkwing (Costello *et al.* 1995) but they do travel up to 50m away from their nest site (Potts, 1985). Wrasse's territorial behaviour and production of benthic eggs can suggest limited dispersal from nesting areas (D'Arcy *et al.* 2013). It has been shown that populations of goldsinny wrasse (Sundt and Jorstad, 1998) and corkwing wrasse (Knutsen *et al.* 2013) are genetically differentiated along the Norwegian coast, and between Atlantic and Scandinavian populations in ballan wrasse (D'Arcy *et al.* 2013) and corkwing (Robalo *et al.* 2011). A relatively long planktonic larval stage, 37-49 days in ballan (Ottesen *et al.* 2012) but only 25 days in corkwing and goldsinny (Darwall *et al.* 1992) may contribute to lowering genetic differentiation between adjacent areas (D'Arcy *et al.* 2013). Water currents can vary in inshore waters and may be responsible for larval transportation along the coast (D'Arcy *et al.* 2013). However, Gonzalez *et al.* (2016) found habitat fragmentation from a long stretch of sand (26km) along the Norwegian coast is the cause of genetic differentiation between western and southern populations of corking. If wrasse populations are spatially fine structured, local populations experiencing high fishing intensity might be		

			overfished. **Ecology and habitat interactions:** ***Cleaning behaviour:*** Additionally, a reduction in cleaning behaviour from the removal of wrasse could have significant implications for parasite populations on other species of fish. Symbiotic cleaning behaviour has been recorded for the five species of wrasse, although not necessarily for both sexes or for all life stages (Costello, 1991). Wrasse cleaning behaviour seems to be instinctive, as wrasse that had never been exposed to salmon before were cleaning within minutes (Bjordal, 1988). Their signature swimming manner, which allows them to swim in any direction, may be recognised by host fish (Costello, 1991). Naylor (2005) noted rock cooks and goldsinny act as cleaner fish on the larger wrasse (i.e. Ballan wrasse) and will remove parasites from their flanks, sometimes in small groups. Certain locations, such as the boilers on a shallow-water wreck, act as ‘cleaning stations’ where this behaviour can regularly be observed (Naylor, 2005). Hilldan (1983) observed ballan wrasse enter goldsinny territory and adopt an invitation posture, before being cleaned by the resident goldsinny in Sweden. Hilldan (1983) found goldsinny were a facultative cleaner (diet not dependent on cleaning). Galeote and Otero (1998) found rock cook does not establish clear cleaning stations in Tarifa (Gibraltar Strait area) and they were facultative cleaners. Henriques and Almada (1997) watched rock cook, goldsinny and corkwing wrasse cleaning behaviour at Arrabida, west coast of Portugal. Only rock cook was observed to clean and mostly cleaning corkwing and ballan wrasse. Rock cook were found to be a facultative cleaner, with only 7% of observed feeding acts from cleaning.		

			Costello (1991) summarised the evidence of cleaning behaviour by wrasse in northern Europe. Corking, goldsinny and rock cook were observed (majority in aquariums) to clean ballan wrasse, plaice, black bream, mackerel, salmon, halibut, anglerfish and grey mullet (Costello, 1991). Henriques and Almada (1997) observed rock cook cleaning mullet, an ocean sunfish, six species of wrasse and four species of sea bream in Portugal. Observations of cleaning activity in the wild are difficult and attempts often disturb the activity (Hilldan, 1983). ***Habitat/ prey interactions:*** Wrasse are adapted for grazing hard animal growths on seaweeds and rocks, and eating shelled animals (crustaceans and molluscs) (Costello, 1991). The removal of a significant amount of wrasse populations could potentially impact their surrounding habitat. There could be a shift in community structure through loss of grazing small invertebrates. For instance, a negative impact may potentially be seen in kelp forests through an increase of epifaunal growth and/ or epifaunal grazing, as wrasse prey upon isopods, gastropods, amphipods and bryozoans (Norderhaug *et al.* 2005). There is no literature on the impact the removal of wrasse would have on seagrass beds. Wrasse diet consists of a large amount of crustaceans, and particularly decapods, which for ballan and cuckoo wrasse, makes up a significant amount of their diet (Matic-Skoko *et al*. 2013; Figueiredo *et al*. 2005; Deady and Fives, 1995; Dipper *et al.* 1977). Wrasse are found in seagrass beds and may use this habitat for feeding. Shore crabs, *Carcinus maenas* are known to inhabit seagrass beds, by burrowing under the seagrass rhizomes (Collins *et al.* 2010). These burrows can undermine the edges of seagrass beds which, in some areas, are already subjected to impacts from moorings and anchors		

			(Collins *et al.* 2010). The importance of wrasse predation on decapods in seagrass beds is unknown. Vanderkift *et al.* (2007) looked at the density of wrasse species occupying seagrass beds with varying distance from rocky reefs and the level of predation on crabs in Jurien Bay and Marmion Lagoon, lower west coast of Australia. The abundances of wrasses varied significantly among distances, they were more abundant at 0m, than at 30m and >300m, indicating that overall abundance of wrasses declined rapidly within a short distance from the reef edge. The level of predation on crabs was not influenced by proximity to reef (Vanderklift *et al.* 2007). Studies have been carried out in New Zealand exploring the relationship of wrasse predating on small invertebrate grazers living on brown seaweeds. Pérez-Matus and Shima (2010) used mesocosms to look at the interaction with the two Labridae, *Notolabrus celidotus* and *N. fucicola* and found they exerted positive indirect effects on the giant kelp, *Macrocystis pyrifera,* via the consumption or behavioural modification of amphipods. Newcombe and Taylor (2010) also used *N. celidotus* in mesocosms but containing three species of brown seaweed. They found predation on epifaunal species reduced epifaunal grazing on the seaweeds. In mesocosms without fish, seaweed biomass was reduced (with increased damage). Additionally, in mesocosms with reduced epifaunal densities, seaweeds were larger but more heavily fouled than seaweeds with uncontrolled epifaunal densities (Newcombe and Taylor, 2010). These experimental results were not consistent with findings from field survey sites with varying fish density. Figueiredo *et al.* (2005) looked at the diet of ballan wrasse in relation to the predation of sea urchins in the Azores. Ballan wrasse were found to be important predators of sea urchins, and larger fish accounted for		

			most of the predation on sea urchins. They concluded that a reduction in the abundance and mean size of fishes could result in a trophic cascade, with the proliferation of sea urchins, through a decrease in predation (Figueiredo *et al.* 2005). ***Predation:*** The importance of wrasse as prey for predators is not known. However, wrasse are identified as prey for commercial species such as gadoids (Halvorsen *et al*. 2016a). They are known to be an important food source for marine birds such as shags and cormorants (Steven, 1933) and have been identified as prey for marine mammals such as the grey seal (Gosch *et al.* 2014). **Non-target species:** Repeated pot deployment may lead to changes in community structure. The selectivity of pots results in low by-catch of non-target species which are released back into the sea. Common by-catch recorded in wrasse pots includes spiny starfish, rockling, sea scorpions, velvet swimming crabs and tompot blennies. Other species seen include conger eels, shrimp, brown crab, squat lobsters, common lobster, whelks, cushion starfish, dragonets, goby, blenny and juvenile gadoids (Pers observation). Benthic communities are thought to be relatively unaffected by static gear due to the footprint of the gear and the small area of the seabed in direct contact (Eno *et al*. 2001). However potential exists for epifauna to be damaged or detached and resistance to this varies with species (Roberts *et al*. 2010). For impact on seagrass bed communities see target attributes/ conservation objectives 4 & 5.		

7. Conclusion

Potting activities are considered to be generally low impact when compared to demersal towed gear. However, there is potential for impact through gear dropping onto organisms on deployment; the movement of gear on the benthos due to tide, current, and storm activity; and as the gear is retrieved if dragged laterally when lifted. Benthic communities are thought to be relatively unaffected by static gear such as potting due to the footprint of the gear and the small area of the seabed in direct contact (Eno *et al*. 2001). No literature on the specific impacts of pots on seagrass beds could be found (Walmsley *et al*. 2015). However, studies have been conducted on the impacts of anchoring and mooring on seagrass beds. These studies were used as a worst case scenario for impacts as pots do not penetrate into the seabed. The wrasse pots used are lightweight and potting for wrasse is thought to predominantly occur on infralittoral rock. There is no exposure for intertidal seagrass beds and a low exposure for subtidal seagrass beds to pressures from wrasse potting activities. Ongoing patrols, on board surveys, data from fisher log books and the Potting Permit Byelaw can identify if there is a change in the current activity levels and spatial distribution. Evidence suggests there are no adverse effects from the impacts of abrasion from potting, and at the current levels of activity in Plymouth Sound SAC the conservation objectives of the sub-features can be reached.

Wrasse stocks and their biology in the UK are poorly understood and whilst there has been some limited research in the past, currently no stock assessment exists. The removal of wrasse can affect their population and social structures. In the past wrasse have been treated as a single species by the fishery, however, they exhibit different life history strategies, requiring different management and monitoring measures (Skiftesvik *et al*. 2015). The impact of the new wrasse fishery in Plymouth is largely unknown, and the need to collect data on the effort and the potential impacts is recognised. Devon and Severn IFCA have introduced management through permit conditions (see section 4) for the Live Wrasse Fishery. D&S IFCA has been carrying out on board surveys to collect information about the fishery. The data collected were reviewed in a report produced in November 2017, which is embedded in this assessment on page 9. The Executive Summary from this report summarises the findings:

'Executive Summary

Wrasse are being targeted in Plymouth Sound for use as a cleaner fish. A fully documented fishery was implemented into the permit conditions of Devon and Severn IFCA Potting Permit Byelaw, to include an intensive data collection program. This report presents the results of the data collection from the first full season of the Live Wrasse Fishery. The two main types of data presented are from landings data recorded by fishers from April to October 2017 and 20 on-board observed surveys carried out by IFCA Officers. On-board survey effort equated to 7.5% observer coverage of boats surveyed, or 5.5% of the entire fleet.

There was no consistent decline in Catch per Unit Effort (CPUE) or Landings per Unit Effort (LPUE). There were observed seasonal fluctuations in CPUE and LPUE and these could be attributed to spatial movements of fishers and their pots, fish behaviour or environmental changes. Continued data collection in the future is vital to determine changes in LPUE and CPUE over time and space.

Spatial fishing effort varied over time across the Plymouth Sound area. Goldsinny and rock cook represented the majority of catch for all vessels. The proportion of species varied considerably spatially and this can be attributed to species preference for exposure and depth, for example, corkwing were found in more sheltered, inshore areas. The majority of observed spawning took place between May to mid-July. The data indicated the current closed season from 1st April to 30th June covers the majority of the spawning season for goldsinny and rock cook.

The size frequency histograms illustrated the importance of Minimum (Min) and Maximum (Max) Conservation Reference Sizes (CRS) for wrasse. The Min CRS (12cm) for goldsinny and rock cook allows a significant proportion of the catch to be returned to sea and to spawn. The

introduction of the Min and Max CRS (15-23cm) for ballan demonstrated an increased proportion of the catch returned to the sea from 4% to 28%, protecting both juveniles and mature adults. However, the current Min and Max CRS (12-23cm) for corkwing is allowing over 90% of the fish caught to be landed. Due to the complex life history of corkwing, and the results of the data analysis, amendments to the slot sizes would be recommended to allow a proportion of immature and mature fish to return to sea.
The results presented in this report highlight the importance of a fully documented fishery and the need to continue data collection to monitor the live-capture fishery for wrasse'.

The report was presented to the D&S IFCA Byelaw and Permitting Sub-committee and recommendations for management changes were proposed and outlined on P.9 of this assessment. D&S IFCA will be consulting on changes to the permit conditions in January 2018. Triggers that would initiate a further review of management are likely to include: any increase in effort (number of boats), failure to meet all permit conditions, failure to adhere to voluntary closed areas, on board surveys identify over half the proportion of the spawning season not protected, a significant decrease in CPUE, and a shift in size distribution.

Further research to look at pot saturation is being considered to inform assessment of the populations in the areas fished. D&S IFCA will liaise with CIFCA and SIFCA to discuss data gathering and research opportunities.

8. In-combination Assessment

8.1 Other Fishing Activities

The following fishing activities are either occurring or have not been able to have been ruled out as occurring in the Plymouth Sound and Estuaries EMS.

Handworking – There are no records of this activity taking place commercially but it has not been able to be ruled out. Therefore no in-combination effect thought to be possible.

Crab tiling – Activity is occurring within Plymouth Sound and Estuaries EMS. Crab tiling has not yet been assessed by D&S IFCA, however, due to the activity not occurring in the intertidal, no in-combination effect thought to be possible.

Digging with forks - Activity is occurring within Plymouth Sound and Estuaries EMS. Digging with forks has not yet been assessed by D&S IFCA, however, due to the activity not occurring in the intertidal, no in-combination effect thought to be possible.

Shrimp push nets - There are no records of this activity taking place but it has not been able to be ruled out. Therefore no in-combination effect thought to be possible.

Pots/ creels - Potting occurs on a medium level within Plymouth Sound and Estuaries SAC. Although potting for crustaceans occurs on similar habitats to wrasse pots (circalittoral and infralittoral rock), wrasse pots are not hauled in areas with a depth greater than 12m so predominantly target infralittoral rock. There are a maximum of 480 pots within D&S IFCA District at any one time. With the existing level of crustacean pots and at the current level of the wrasse fishery, it is thought that no in-combination effects will lead to the conservation objectives not being met for the features assessed.

Cuttlepots - Activity not occurring, therefore no in-combination effect thought to be possible.

Commercial diving - Activity not believed to be occurring/ occurring at a very low level. Therefore no in-combination effect thought to be possible.

Beach seine/ ring nets - There are no records of beach seine nets but it has not been able to be ruled out. Therefore no in-combination effect thought to be possible. Ring nets are occurring in Plymouth Sound with two permanent ring netters and sometimes visiting ring netters. Ring nets do not interact with the sub-features assessed, therefore, no in-combination effect thought to be possible.

Purse seine - There are no records of this activity taking place but it has not been able to be ruled out. Therefore no in-combination effect thought to be possible.

Drift, gill, trammel & entangling nets - Drift netting occurring on a medium level, with several small dories drift netting for herring. Fixed nets (gill, trammel and entangling) are known to occur within and close to Plymouth Sound and Estuaries SAC. Due to the low level of both fishing activities occurring on seagrass it is thought that no in-combination effects will lead to the conservation objectives not being met for the features assessed.

Fyke and stakenets - There are no records of this activity taking place but it has not been able to be ruled out. Therefore no in-combination effect thought to be possible.

Longlines - Activity occurs at a very low level, with one long-liner operating around the mouth of the Tamar. Due to the low level of fishing activity it is thought that no in-combination effects will lead to the conservation objectives not being met for the features assessed.

Handlines, Jigging and trolling - There are no records of these activities taking place commercially but they have not been able to be ruled out. Therefore, no in-combination effect thought to be possible.

D&S IFCA conclude there is no likelihood of significant adverse effect on the interest features from in-combination effects with other fishing activities addressed within section 8.1.

8.2 Other Activities

Plymouth Sound and Estuaries EMS is a busy site, with other commercial ongoing plans/projects from different sectors where impacts could combine.

SAC & SPA:
Description: Drake’s Island hotel development including conversion of Grade II listed Island House, Barracks & Ablutions Blocks, Scheduled Ancient Monument casemated battery & landscaping, refurbishment of jetty & infrastructure works.
Pressures:

- Abrasion/disturbance of the substrate on the surface of the seabed
- Litter
- Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion
- Removal of target species
- Above water noise
- Visual disturbance

In-combination assessment: The application has since been refused by Plymouth City Council. Therefore, no in-combination effect thought to be possible.

SPA:

Description: Kinterbury Helicopter site includes construction of helicopter landing pad, demolition of three buildings, construction of a new building and modifications of one building.
Pressures:
- Above water noise
- Visual disturbance

In-combination assessment: Potting thought to only occur in the subtidal and not believed to interact with features assessed. Therefore no in-combination effect thought to be possible.

Description: Trevol Jetty refurbishment, Torpoint.
Pressures:
- Abrasion/disturbance of the substrate on the surface of the seabed
- Litter
- Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion
- Above water noise
- Visual disturbance

In-combination assessment: Potting thought to only occur in the subtidal and not believed to interact with features assessed. Therefore no in-combination effect thought to be possible.

Other*:* The impact of future plans or projects will require assessment in their own right, including accounting for any in-combination effects, alongside existing activities.

D&S IFCA conclude there is no likelihood of significant adverse effect on the interest features from in-combination effects with other plans or projects addressed within section 8.2.

9. Summary of consultation with Natural England

The original assessment (version 1) was formally signed off by Natural England on 03/05/2016. The activities (cuttlepots and fishtraps) were not believed to be occurring at that time. However, new information has revealed an emergent fishery for wrasse using fish traps and has therefore prompted a re-assessment of the fishing activity. Cuttlepots have been assessed in a separate HRA. A re-assessment for fishtraps was sent for informal advice to Natural England in April 2017 (version 2) and this assessment (version 3) contains amendments from the advice received and updated management measures.

10. Integrity test

It can be concluded that the activities assessed in this HRA, fish traps, alone or in-combination, do not adversely affect the sub-features: subtidal seagrass beds and intertidal seagrass beds of the Plymouth Sound and Estuaries SAC and that future activity, at the levels anticipated, will not foreseeably have an adverse effect on these sub-features of the site. Due to the D&S IFCA Potting Permit Byelaw the number of potters in the district can be monitored. The permitting system allows for adaptive management and changes are being made to the permit conditions, via a consultation.

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.

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Annex 2: Natural England's consultation advice

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

Annex 3: Site Map

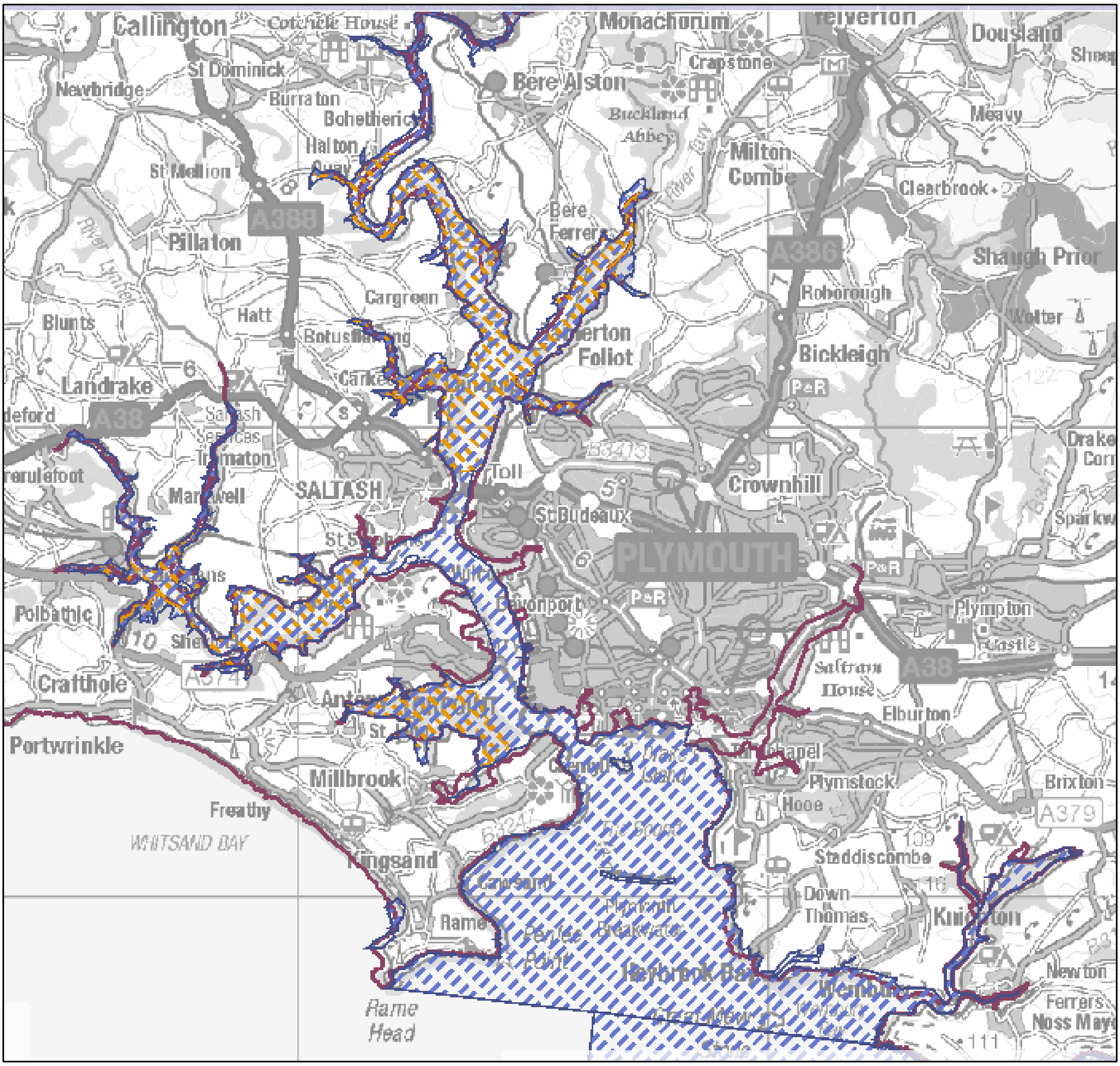


Figure 2 - Area of SAC (blue hatched) and SPA (Orange hatched) (MAGIC, 2015)

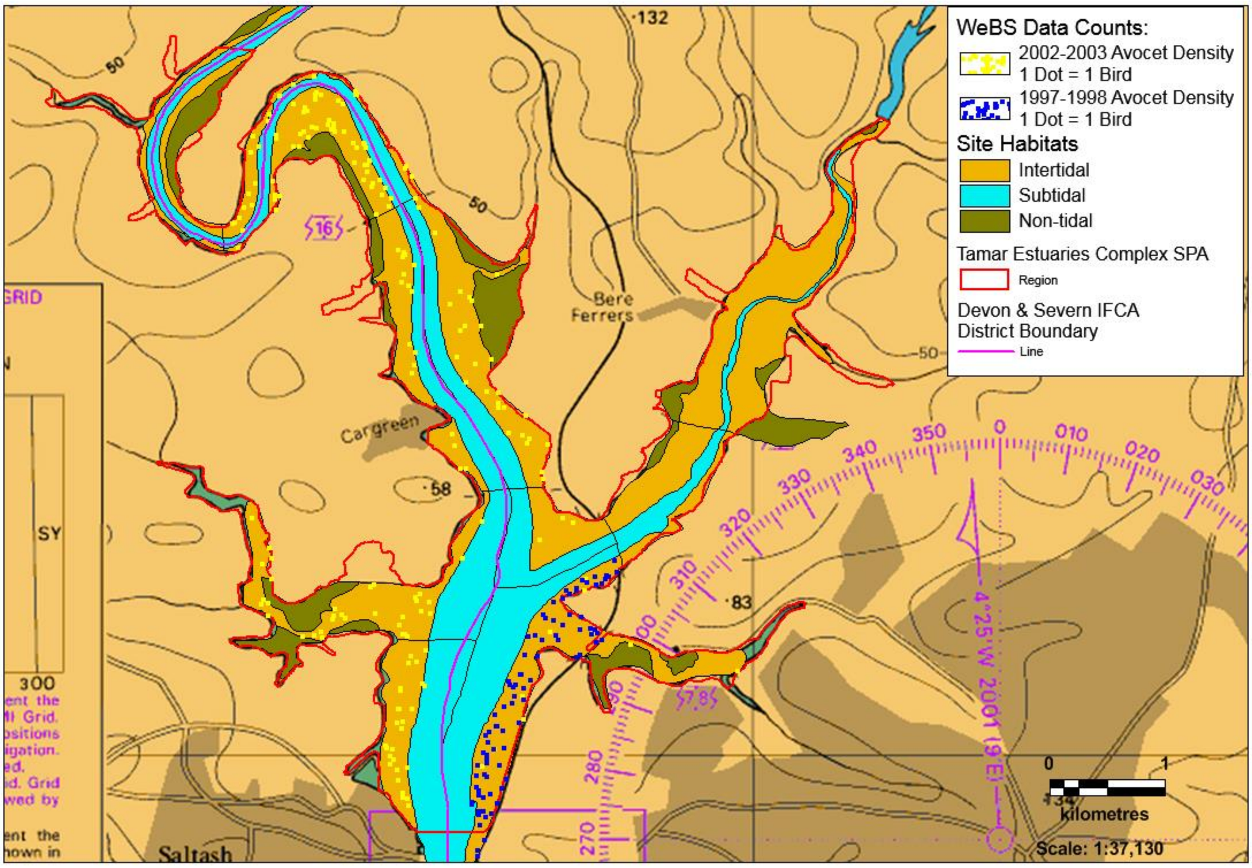


Figure 3 - Tamar Estuaries Complex SPA and WeBS data for Avocet density (in November, December, January and February 1997-1998 & 2002-2003).

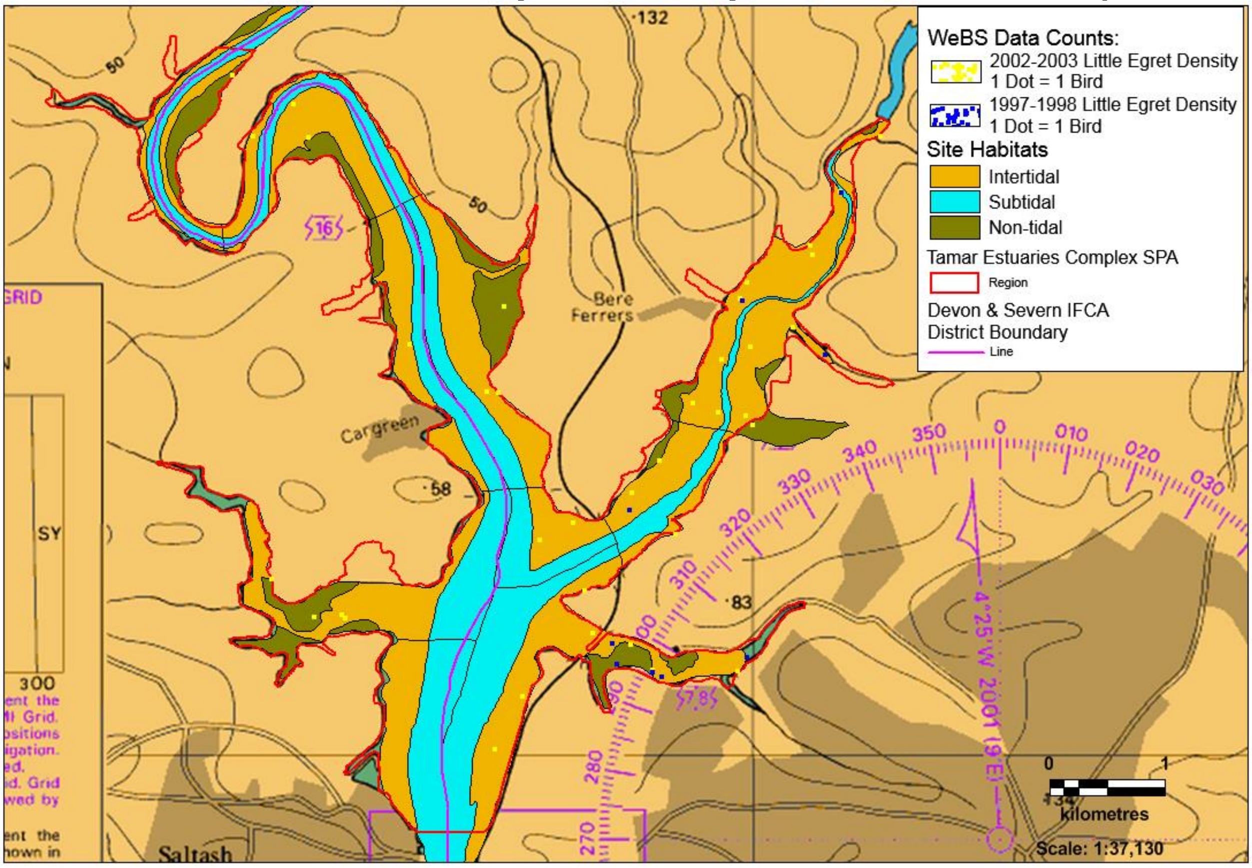


Figure 4 - Tamar Estuaries Complex SPA and WeBS data for Little Egret density (in November, December, January and February 1997-1998 & 2002-2003).

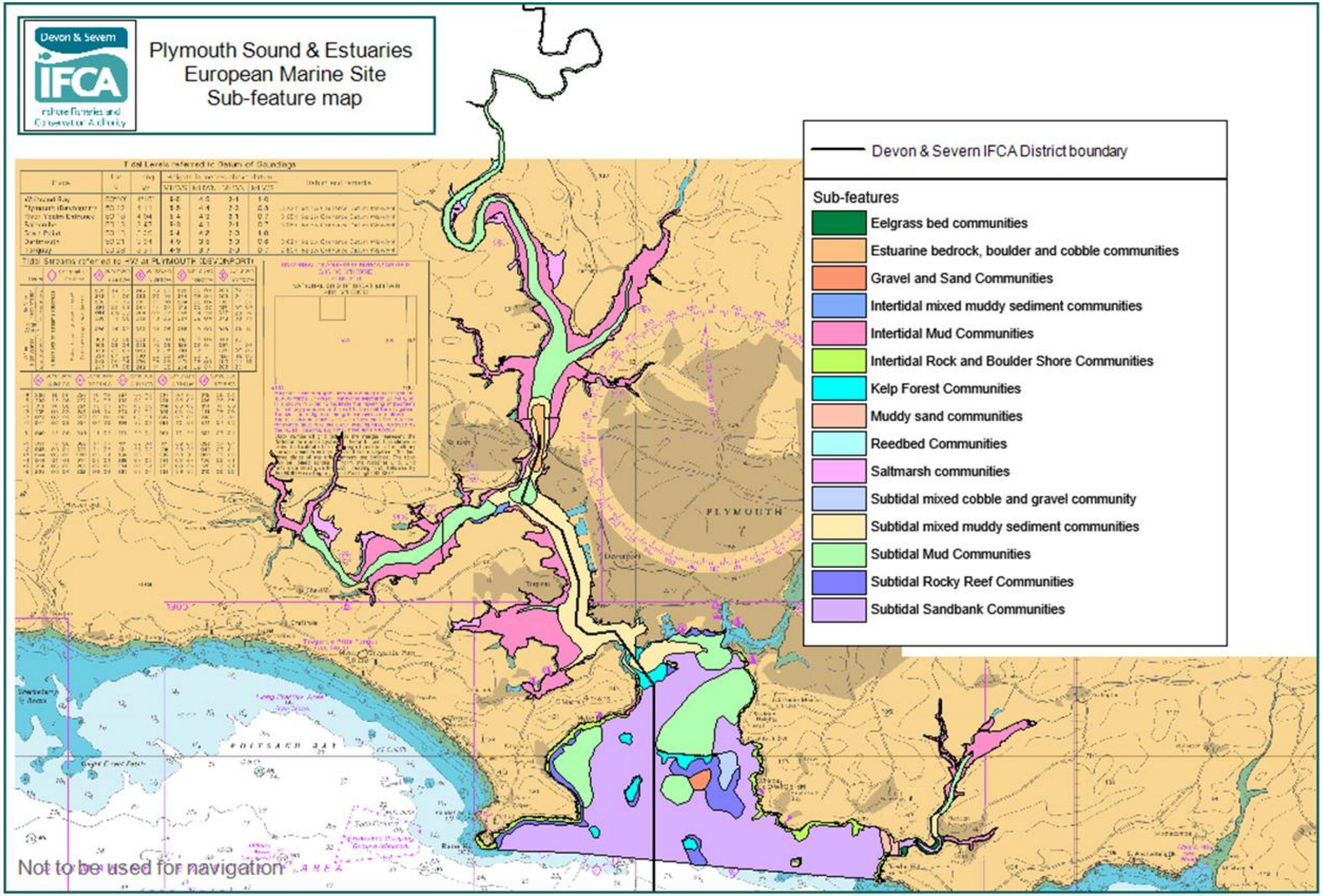


Figure 5 - Plymouth Sound & Estuaries EMS sub-features Annex 4: Fishing activity maps

Annex 4: Fishing activity maps

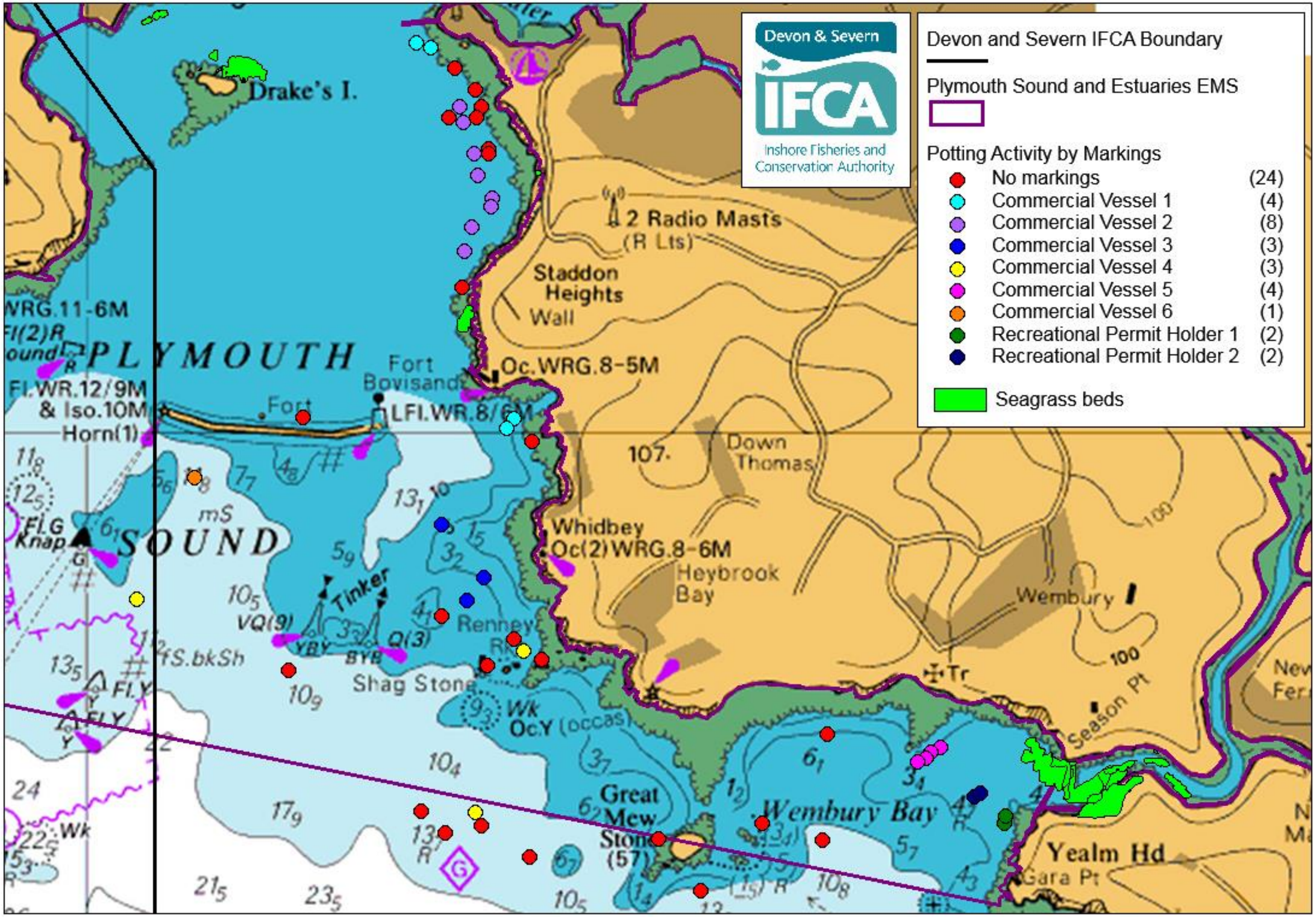


Figure 6 - Potting activity (markings on buoys) recorded within and near Plymouth Sound and Estuaries EMS in May 2016.

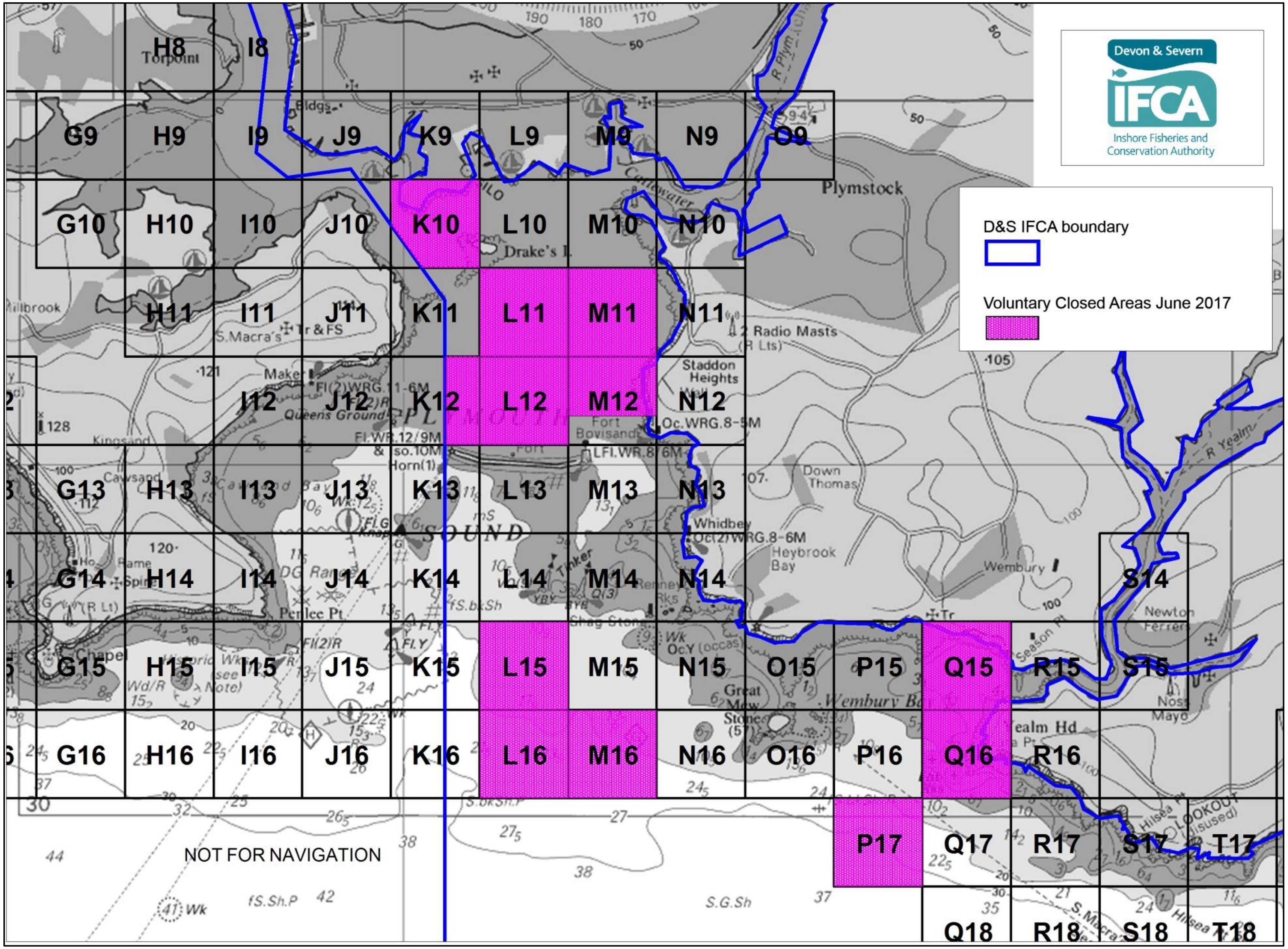


Figure 7 - Voluntary closed areas to the Live Wrasse Fishery (implemented end of June 2017)

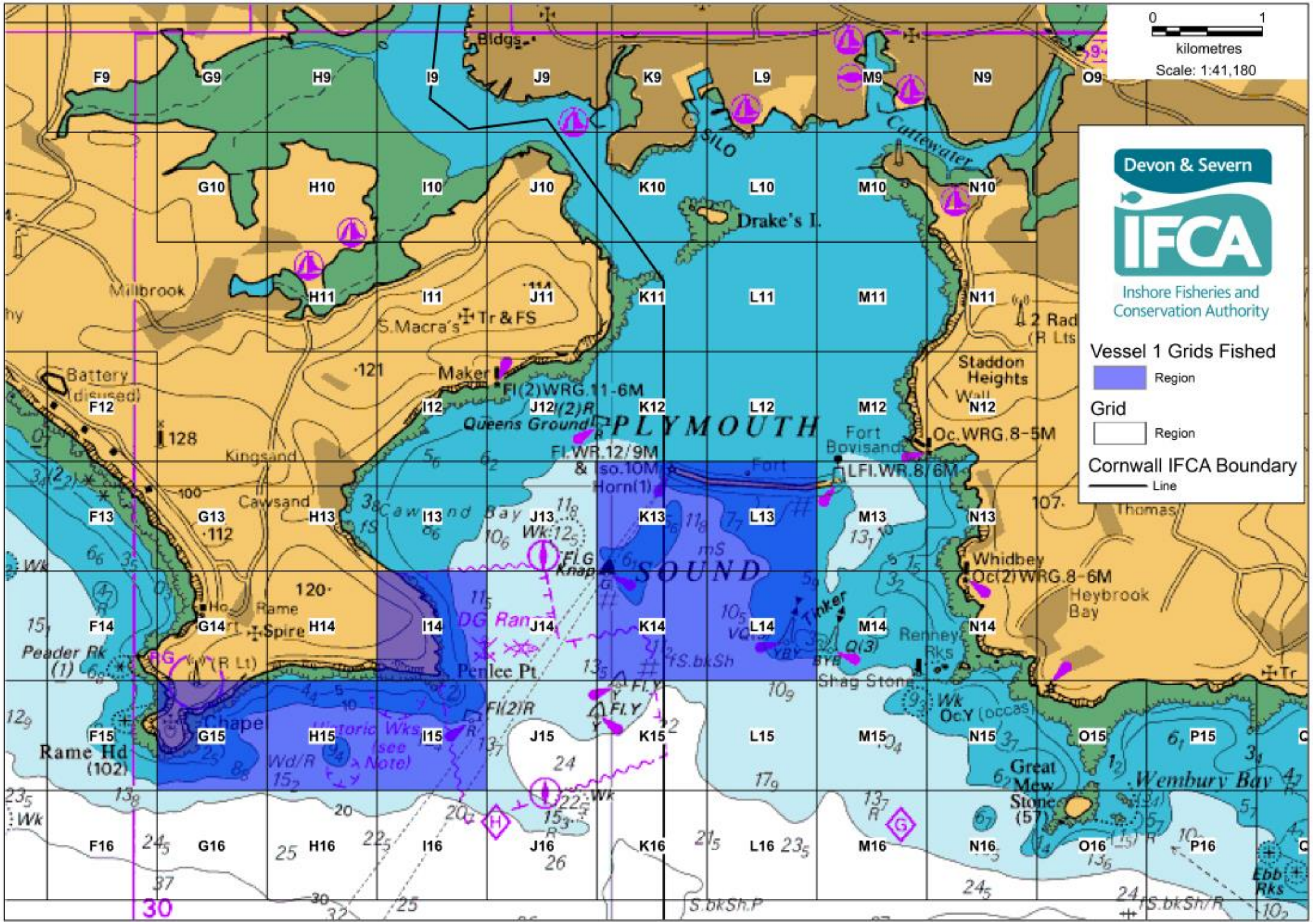


Figure 8 - Vessel 1 areas fished (April 2017 to August 2017)

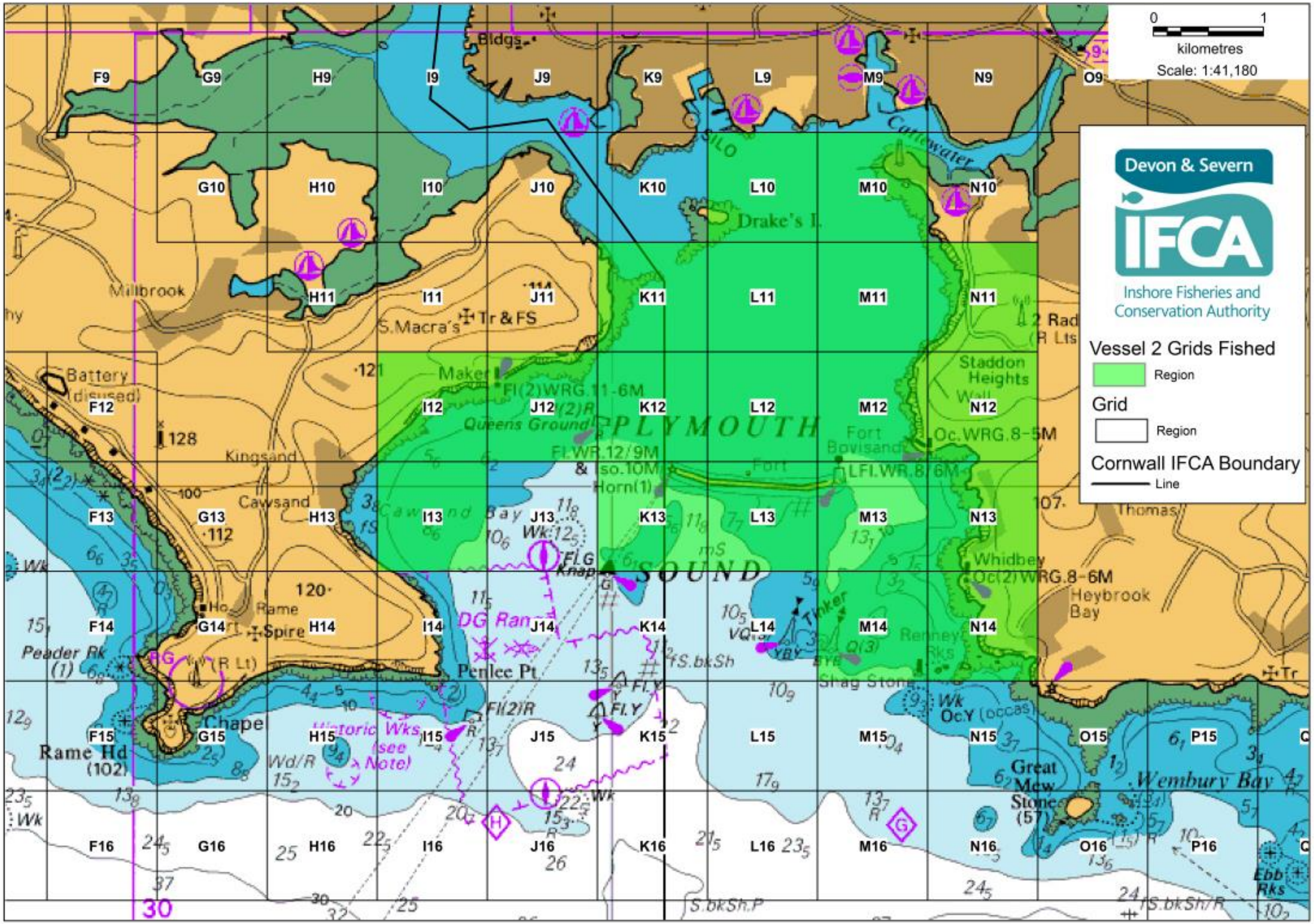


Figure 9 - Vessel 2 areas fished (May 2017 to August 2017)

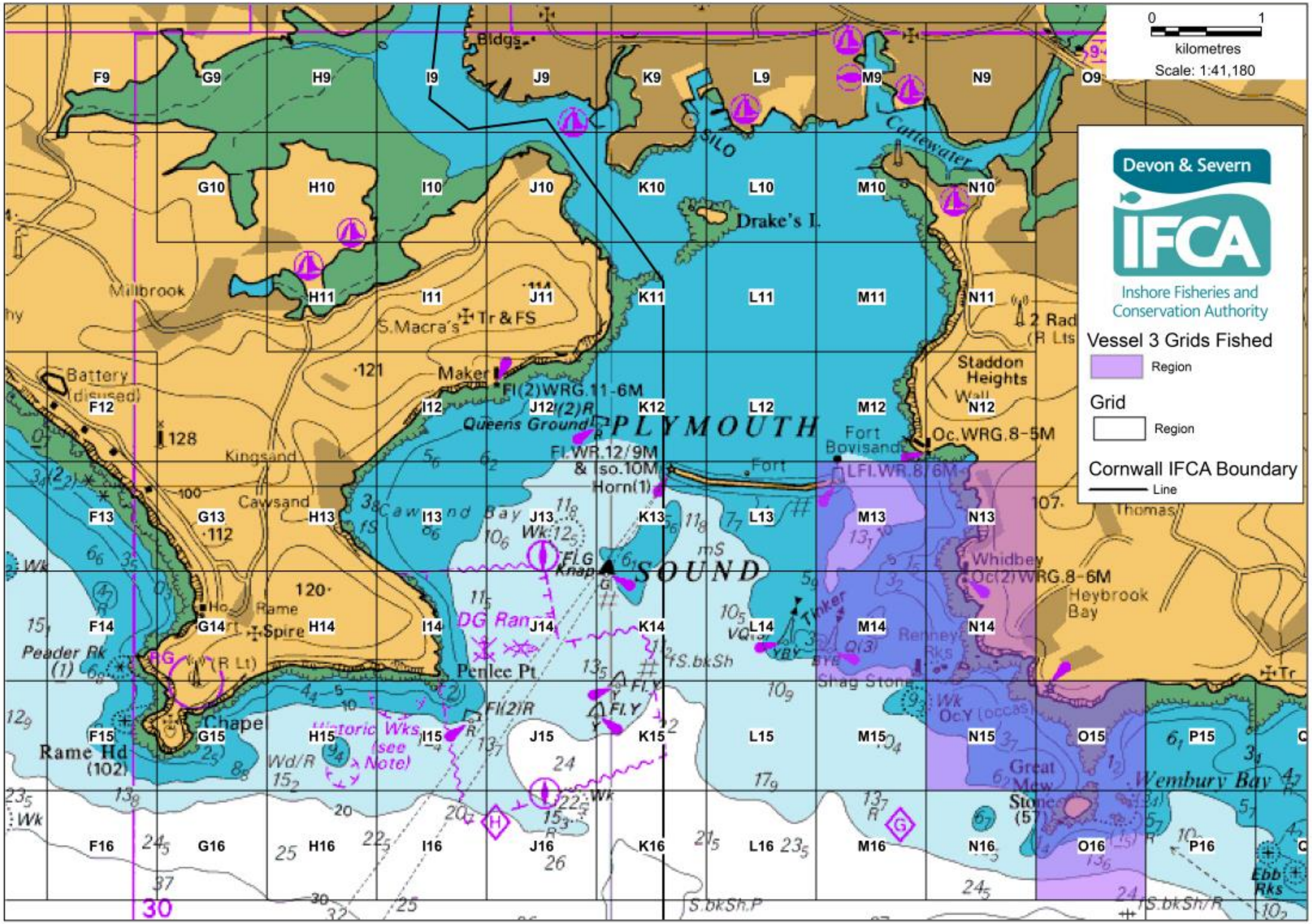


Figure 10 - Vessel 3 areas fished (April 2017 to August 2017)

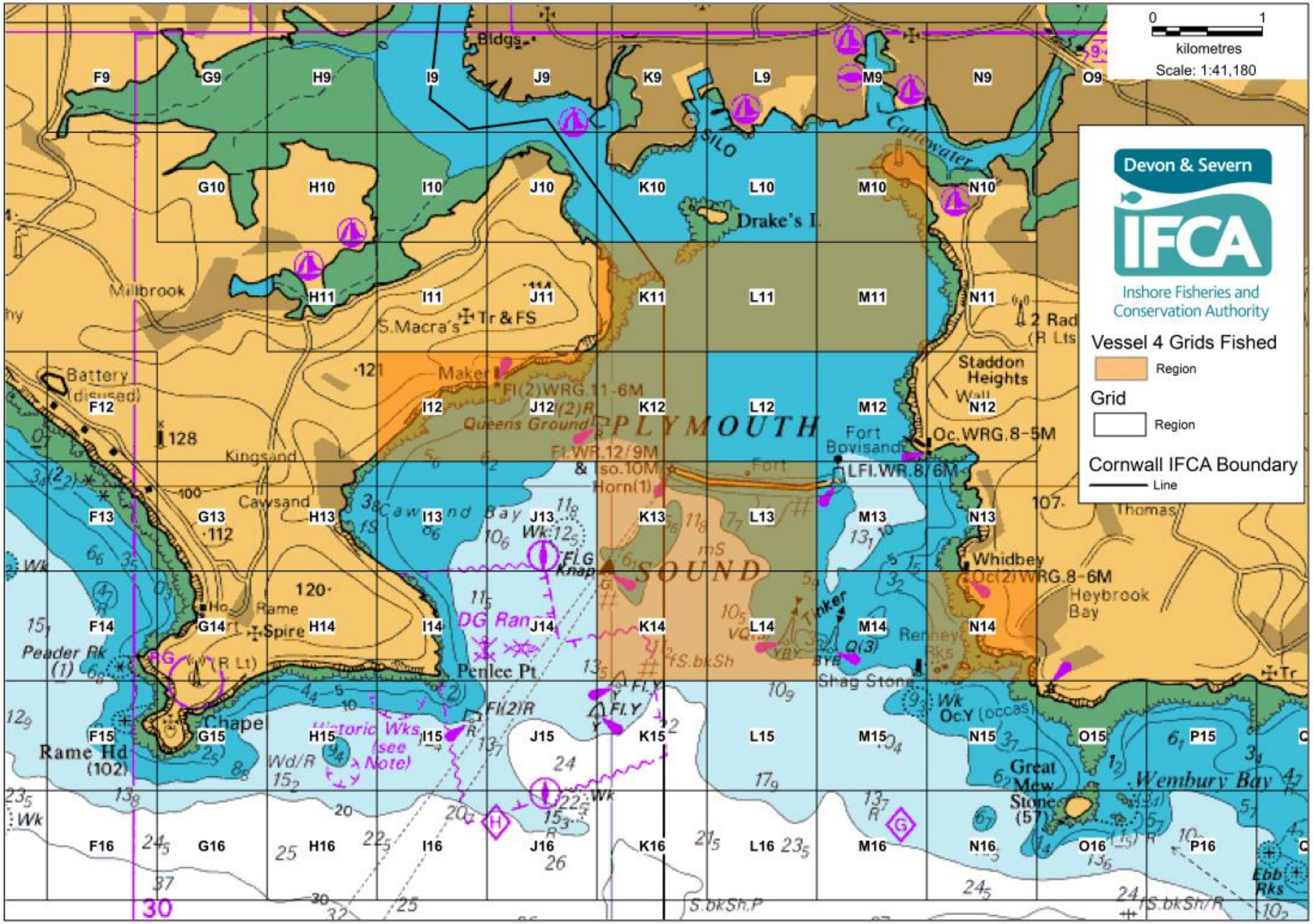


Figure 11 - Vessel 4 areas fished (June 2017 to August 2017)

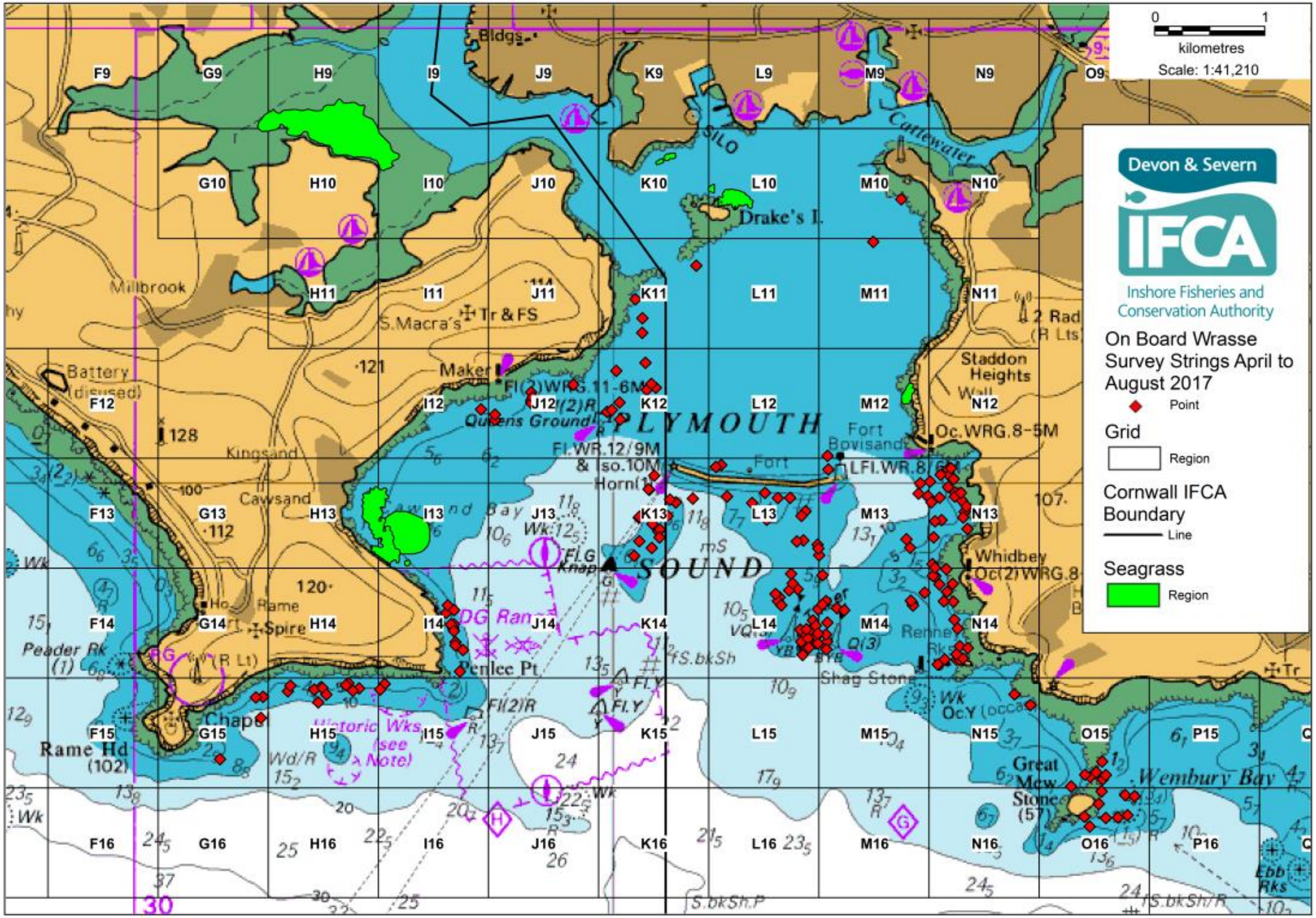
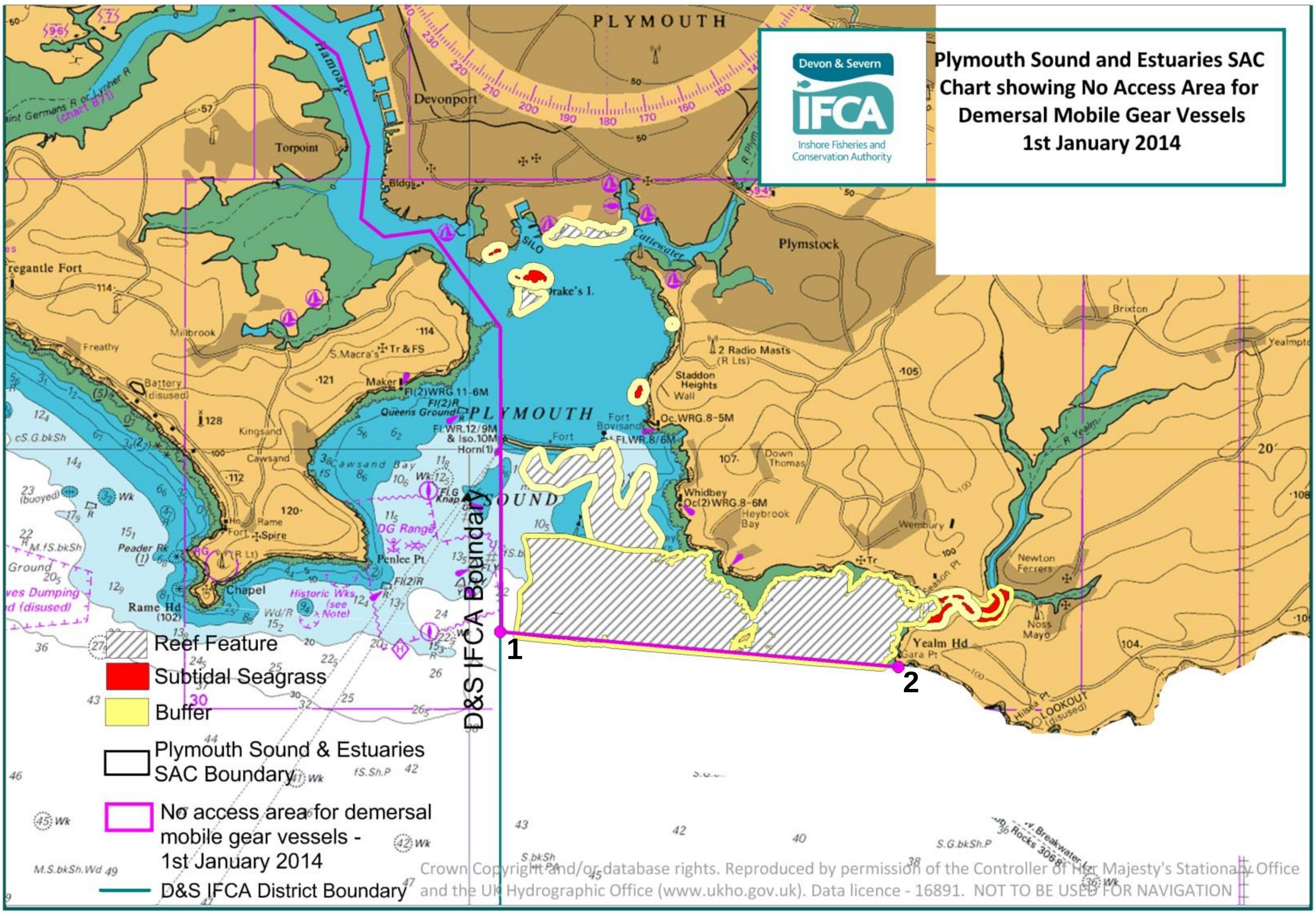


Figure 12 - Strings surveyed during on board wrasse surveys April to August 2017

Annex 5: Mobile Fishing Permit Byelaw map

No demersal mobile gear is permitted landward (up to High Water Mark) of a line following the western extent of the Devon and Severn IFCA district boundary and drawn between points 1 and 2 across Plymouth Sound.

Point Number	Latitude			Longitude		
1	50^0	18.484'	N	004^0	09.600'	W
2	50^0	18.192'	N	004^0	04.458'	W



Annex 6: Pressures Audit Trail

Traps Pressure(s)	SAC Sub-feature(s)		Screening Justification
	Intertidal seagrass	Subtidal seagrass	
Abrasion/disturbance of the substrate on the surface of the seabed	S	S	**IN** – Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Genetic modification & translocation of indigenous species	S	S	**OUT** – the fleet operates in local area only so risk considered extremely low
Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	NS	NS	**OUT** - Insufficient activity levels to pose risk of large scale pollution event
Introduction of other substances (solid, liquid or gas)	IE	IE	**OUT** - Insufficient activity levels to pose risk of large scale pollution event
Introduction or spread of non-indigenous species	S	S	**OUT** - Fleet operates in local area only so risk considered extremely low
Litter	IE	IE	**OUT** - Insufficient activity levels to pose risk at level of concern
Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	S	S	**OUT** – Penetration of the substrate from anchoring when potting, occurs on such an infrequent basis that the impact would be minimal.
Removal of non-target species	S	S	**IN** – Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Removal of target species	NS	NS	**IN** – Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.	NS	NS	**OUT** - Insufficient activity levels to pose risk of large scale pollution event
Transition elements & organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	NS	NS	**OUT** - Insufficient activity levels to pose risk of large scale pollution event

Pressure(s): No advice on operations for traps so anchored nets/lines used instead.	Bird features & Screening Justification		SPA Supporting habitat(s) & Screening Justification
	Avocet	Little egret	Intertidal seagrass
Above water noise	**Sensitivity: S**	**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
Barrier to species movement	**Sensitivity: S**	**Sensitivity: S**	
	OUT – Insufficient activity levels to pose risk at level of concern		
Collision ABOVE water with static or moving objects not naturally found in the marine environment	**Sensitivity: S**	**Sensitivity: S**	
	OUT – Insufficient activity levels to pose risk of large scale pollution event		
Genetic modification & translocation of indigenous species			**Sensitivity: S** **OUT** – the fleet operates in local area only so risk considered extremely low
Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	**Sensitivity: IE**	**Sensitivity: IE**	**Sensitivity: NS** **OUT** - Insufficient activity levels to pose risk of large scale pollution event
	OUT – Insufficient activity levels to pose risk of large scale pollution event		
Introduction of other substances (solid, liquid or gas)	**Sensitivity: IE**	**Sensitivity: IE**	**Sensitivity: IE** **OUT** - Insufficient activity levels to pose risk of large scale pollution event
	OUT – Insufficient activity levels to pose risk of large scale pollution event		
Introduction or spread of non-indigenous species	**Sensitivity: NS**	**Sensitivity: NS**	**Sensitivity: S** **OUT** - Fleet operates in local area only so risk considered extremely low
	OUT – Fleet operates in local area only so risk considered extremely low		
Litter	**Sensitivity: IE**	**Sensitivity: IE**	**Sensitivity: IE** **OUT** - Insufficient activity levels to pose risk at level of concern
	OUT – Insufficient activity levels to pose risk at level of concern		
Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion			**Sensitivity: S** **OUT** – Penetration of the substrate from anchoring when potting, occurs on such an infrequent basis that the impact would be minimal.
Removal of non-target species	**Sensitivity: S**	**Sensitivity: S**	**Sensitivity: S** **IN** – Pot selectivity results in very low incidental by-catch and mortality
	OUT – Pot selectivity results in very low incidental by-catch		
Removal of target species			**Sensitivity: NS** **IN** – Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure

Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.	**Sensitivity: IE**	**Sensitivity: IE**	**Sensitivity: NS** **OUT** - Insufficient activity levels to pose risk of large scale pollution event
	OUT - Insufficient activity levels to pose risk of large scale pollution event		
Transition elements & organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	**Sensitivity: S**	**Sensitivity: S**	**Sensitivity: NS** **OUT** - Insufficient activity levels to pose risk of large scale pollution event
	OUT - Insufficient activity levels to pose risk of large scale pollution event		
Visual disturbance	**Sensitivity: S**	**Sensitivity: S**	
	IN - Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure		