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)
HRA_UK0013111_W23	Fishtraps	Intertidal rock
HRA_UK0013111_Z23		Circalittoral rock
HRA_UK0013111_AC23		Infralittoral rock

(V.5 Updated June 2021)

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 additional management measures are required in order to ensure that fishing activity or activities will have no adverse effect on the integrity of the site.

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 rock’, ‘circalittoral rock’ and ‘infralittoral rock’ 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.

This HRA represents a review of one of five HRAs, on the interaction of fish traps on features of the Plymouth Sound and Estuaries SAC. These HRAs were initially completed in January 2018 and sent to NE for their formal advice. This was followed by a review in 2020; Natural England advised that the HRAs be reviewed again after a period of one year to take account of the most up to date evidence on the fishery. This represents the review advised by Natural England in 2020.

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)
- Previous fish trap vs rock HRA and Natural England’s advice on the HRA (Annex 2)
- Site map(s) – sub-feature/feature location and extent (Annex 3)
- Maps of fishing activity and voluntary closed areas (Annex 4)
- Mobile fishing permit byelaw map (Annex 5)
- Pressures Audit Trail (Annex 6)

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

- Review of the Live Wrasse Fishery in Devon and Severn IFCA's District 2017–2020 (Annex 7)
- Paper provided to D&S IFCA's Byelaw and Permitting Sub-Committee, addressing concerns raised in the 2021 consultation on Amendments to the Permit Conditions to Manage the Live Wrasse Pot Fishery (Annex 8).
- The South West Inshore Marine Plan.

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. A pot fishery for live wrasse has developed in the Plymouth Sound, the wrasse being trapped 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 up to four vessels each year that fish for wrasse in D&S IFCA's District. Whilst the fishery for wrasse could potentially take place year-round, fishers tend not to fish for wrasse in January and February each year, and the period May–mid-July is currently closed for fishing under D&S IFCA's Potting Permit Byelaw Conditions, amended in 2018 (see Section 4.2). Therefore the fishery typically operates between March–May and mid-July–December; this allows good time for a review of data and evidence collected on the wrasse fishery, with a window for adapting management via a review of Potting Permit Byelaw Conditions if required (as detailed in Section 4.1 – Section 4.3, below). The parlour pots used are specifically designed to catch wrasse (Figure 1). They are lightweight (3.7kg) and fitted with wrasse escape gaps. The traps measure 72Lx40Wx28H (cm).

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 ranged from 5 m to up to 8 m and work to depths of 12 m. They mostly worked within Plymouth Sound, south of the breakwater and along the shore from Mount Batten Breakwater down to the Mew Stone. Three of these vessels also fished within Cornwall IFCA's District from Fort Picklecombe

to Rame Head. Detailed information on the wrasse fishery can be seen in the PDFs attached at the end of Section 4 (Page 12).

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 potting activity occurring (Annex 4, Figure 1). A total of 24 buoys/bottles were unmarked and, of these, 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 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-based research on wrasse and live wrasse fisheries was undertaken in late 2016/early 2017 (see embedded document below) and the findings were reported to the D&S IFCA's Byelaw and Permitting Sub-committee. Management of the Live Wrasse Fishery then proceeded as detailed in Section 4.1 – Section 4.3.

A review of wrasse ecology and fisheries

4.1 Management of the Live Wrasse Pot Fishery

Five initial management measures were established in July 2017, following a period of public consultation and consideration by D&S IFCA's Byelaw and Permitting Sub-Committee (B&PSC) and the Full Authority. These management measures were:

1. **To establish a Fully Documented Fishery**
   Under Paragraph 17 of the Potting Permit Byelaw, those permit holders who wish to engage in the Live Wrasse Pot Fishery are required to provide relevant fishery information to the Authority. 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.

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

2. **Pot Limitations**
   The maximum number of pots per permit holder shall not exceed 120.

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 with "WRA" together with the vessel's 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 30th June was closed to the Live Wrasse Pot Fishery.

5. **Minimum and maximum conservation reference sizes**
   To introduce Minimum and Maximum Conservation Reference Sizes for five species of wrasse:
   a. Ballan and cuckoo wrasse less than 150mm or greater than 230mm
   b. Corkwing, rock cook and goldsinny wrasse less than 120mm or greater than 230mm

4.2 Initial Management Review Process (2017-2018)

- The Authority 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 decided that a review of the management of the Live Wrasse Fishery was to be undertaken in November 2017. Data collected from fishermen and on-board surveys informed the review of the permit conditions for the Live Wrasse Fishery, 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 D&S IFCA's B&PSC The B&PSC recommended proposed changes to management measures for the Live Wrasse Fishery, which were implemented in August 2018 following a period of public consultation and consideration by the Byelaw and Permitting Sub-Committee and the Full Authority. The implemented changes were:
  - **to amend the slot size for corkwing to 140mm to 180mm**
  - **to change the closed season to May 1st to 15th July.**

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 zones that are closed 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. Figures 2 and 3 (Annex 4) show the areas closed to the Live Wrasse Fishery, which were updated in 2018, in consultation with the fishers. There is also an eastern limit to the fishery to prevent its spread along the coast from Plymouth Sound, containing the effort and allowing for robust repeat monitoring.
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.

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.

4.3 Further Live Wrasse Pot Fishery Management Review Processes (2018 – 2021)

In November 2018, the D&S IFCA's B&PSC was presented with the Live Wrasse Data Analysis Nov 2018 report (embedded below), a report on the Formal Review of the Live Wrasse Pot Fishery (embedded below). Members recommended that (subject to the findings of further evidence presented by D&S IFCA Officers) there should be no changes to the current management of the Live Wrasse Pot Fishery. Management includes both the Potting Permit Conditions and separate Policy & Guidance. Subsequently, in February 2019, the B&PSC was presented with an addendum

to the Live Wrasse Data Analysis (Nov 18) report. Members endorsed the findings of this report and recommended that existing management measures for the Live Wrasse Pot Fishery be maintained, and that a Comprehensive Review of the Live Wrasse Pot Fishery be undertaken at the end of 2019, reflecting the three years of data collected by that point.

Data collection for the Live Wrasse Pot Fishery in 2019 ended in December 2019, allowing for production of the Three Year Comprehensive Review of the Live Wrasse Fishery in D&S IFCA's District (embedded below), which was presented to the B&PSC in February 2020. The Three Year Comprehensive Review showed that while Landings Per Unit Effort (LPUE) and Catch Per Unit Effort (CPUE) appeared to be stable or increasing for most species, these measures showed a decline in rock cook over the 2017–2019 period. On this basis D&S IFCA's B&PSC recommended the prohibition of removal of rock cook from a fishery by all Potting Permit holders, including those prosecuting the Live Wrasse fishery. This change to the Potting Permit Byelaw Conditions was confirmed at the Byelaw and Permitting Sub-Committee meeting on 18th June 2020.

Data collection continued in 2020 and despite the difficulties posed by the COVID-19 pandemic D&S IFCA's Environment Officers completed observer surveys on approximately 6.3% of total fishing trips in 2020. The data were analysed in early 2021 for the Annual Review of the Live Wrasse Fishery in D&S IFCA's District (2017–2020) (Annex 7). This review used updated methods, adapted from Henly *et al.* (2021), which standardised monitoring data from D&S IFCA's fishery observer surveys using fishing locations and environmental data obtained from external sources. In doing so, the Annual Review identified the main drivers of variation in CPUE and LPUE for the four target species of wrasse, and highlighted considerations for management of the fishery.

The main drivers of variation in CPUE and LPUE differed between species. There was evidence of a decline in ballan wrasse CPUE and LPUE during the 2017–2020 period, particularly on the landward side of the breakwater and between 2017–2018. This decline was likely driven by the relatively high retention rate of ballan wrasse in combination with specific life history and behavioural characteristics that leave the species vulnerable to overfishing. There was no evidence of a decline in rock cook CPUE or LPUE across the 2017–2020 period. However, the updated methods used in the most recent report showed that rock cook CPUE and LPUE varied significantly between broad-scale fishing areas (significantly lower in the more sheltered areas). The spatial distribution of fishing and survey effort has varied markedly over the 2017–2020 period, and in 2019 and 2020 the majority of the observer surveys were conducted in more sheltered locations. Previous reports by D&S IFCA were unable to account for this geographic variation in CPUE and LPUE, which was therefore interpreted in precautionary terms as a decline in rock cook over the 2017–2019 period. Goldsinny wrasse showed seasonal and geographical variation in CPUE and LPUE that supports previous observations of goldsinny, and there was no evidence that these measures declined during the 2017–2020 period. Finally, there was a significant increase in corkwing wrasse CPUE across the 2017–2020 period. The change in corkwing CRS limits in 2018 has likely benefitted the species as a lower proportion of caught corkwing are being landed (lower retention rate, higher rate of return to sea) and mature individuals of each sex are likely being protected. There was also evidence of seasonal variation in corkwing CPUE and LPUE which may reflect the species' spawning season and associated activity levels. The report also highlighted that robust monitoring of the fishery relies on high quality observer surveys, which provide information that cannot be gained from fishers' returns forms.

The report was presented to the D&S IFCA's B&PSC with the following recommendations for management:

1. Continue to manage the fishery as outlined in the D&S IFCA's Policy Statement and Potting Permit Conditions for the Live Wrasse Fishery (24th June 2020), except in the case of rock

cook (2, below) and ballan wrasse (3, below), and except with regards to fishers returns forms (4, below).
2. Lift the prohibition on removal of rock cook from the fishery and reintroduce previous conservation reference size (CRS) limits of 12-23 cm.
3. Change the ballan wrasse CRS range from 15–23 cm to 18–26 cm.
4. Remove the requirement for wrasse fishers to submit returns forms.

The B&PSC reviewed the evidence and recommended the following proposed changes to management measures for the Live Wrasse Fishery:

That D&S IFCA will continue to manage the fishery for 12 months as outlined in the D&S IFCA's Policy Statement and Potting Permit Conditions for the Live Wrasse Fishery (24th June 2020), except:

- **To change the ballan wrasse CRS range from 15 – 23cm to 18 – 26cm.**
- **To remove the requirement for wrasse fishers to submit returns forms.**

The change to ballan wrasse CRS range was subject to public consultation for a period of four weeks (14th April – 12th May). Removal of a requirement to submit returns forms does not affect the Potting Permit Conditions so was not subject to consultation. In July 2021, the B&PSC reviewed the available evidence alongside the results of the consultation on the Potting Permit Conditions, and approved the proposed changes to ballan wrasse CRS range. The change to the ballan wrasse CRS range is a precautionary measure in case of future increases in fishing effort: the decline in ballan CPUE and LPUE identified in Henly *et al.* (2021) occurred between 2017 – 2018, following a period of high fishing pressure. As outlined elsewhere, including in Henly *et al.* (2021), the fishing effort in Plymouth Sound has declined substantially since then. D&S IFCA advocates that the proposed ballan CRS range would help to safeguard the ballan population should fishing effort increase (though there are currently only two permit holders for the 2021 season, compared to four in 2017).

To date, fishing has largely taken place outside of the voluntary closed areas which were implemented in April 2018 (Annex 4). However, over the course of 2019 and 2020 a total of six incursions into a closed area in the south of Jennycliff Bay are known to have occurred (cell M12). These incursions occurred on days that an observer was monitoring the vessel, though it was not possible to determine the location of fishing relative to the closed area until after the fact. The fisher involved typically used six strings of pots in areas along the eastern coast of Plymouth Sound, from Batten Bay to Renney Rocks, and regularly re-shot his gear in locations near to the site of hauling; it is therefore possible that the fisher was also fishing in the closed area on other days. The fisher was informed of their non-compliance and strings were then moved accordingly. Given the general compliance of the voluntary closed areas it would undermine the fishers to make the closed areas mandatory. Having voluntary closed areas allows D&S IFCA to involve the stakeholders resulting in a valued co-management approach that is thought to improve compliance over entirely top-down imposition of management measures.

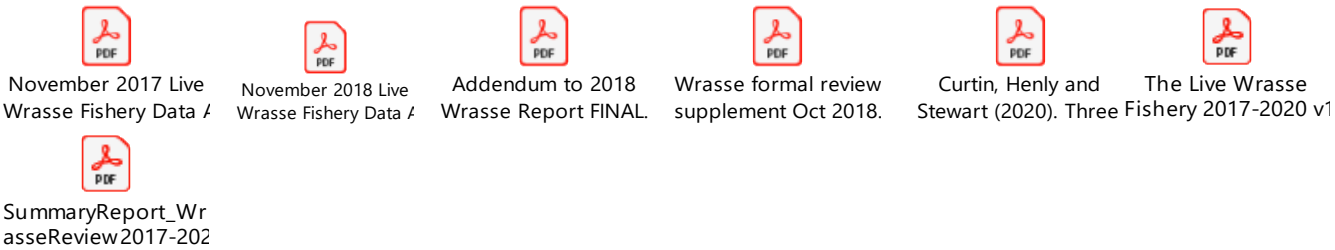
Conversely, compliance with the returns forms aspect of the Fully Documented Fishery is relatively low, which prevents thorough examination of the returns data. The main advantage to accurate returns data would be the availability of fine-scale information on wrasse landings over time. Fortunately, this information is available on transport documents provided by the salmon farm agent, though admittedly at a coarser temporal resolution (approximately every week or fortnight, sometimes monthly), rather than daily (though fishers do not always report daily totals). Given the issues of low compliance and inaccurate reporting, the primary value of these returns forms has been in aiding D&S IFCA's understanding of the spatial distribution of fishing effort in each year.

D&S IFCA's officers have reviewed the requirement to submit returns forms, and have identified two further constraints associated with these data, which apply even to fully-completed returns data: (i)

the spatial scale of reporting of wrasse catches means that it is not possible to estimate the numbers of wrasse caught in each grid cell (since total wrasse retained are reported for the trip, not for each string) and, critically, (ii) recent analyses have demonstrated that robust monitoring and management of this fishery requires species-specific data on catch and landings per unit effort, which are not available from these fishers' returns forms. Species-specific data are only available from the observer surveys carried out by D&S IFCA's officers, which have provided a four-year dataset collected with standardised methods that is therefore comparable with future data collected by observers.

In 2020 D&S IFCA developed a method of observing catch using D&S IFCA's enforcement vessel. This method proved more efficient than in previous years and allowed observer surveys to continue despite the complications caused by the Covid 19 pandemic. The requirement for fishers to submit returns forms has been removed, which will reduce the associated administrative and time cost of monitoring, and allow greater focus on monitoring via observer surveys. The observer surveys provide much richer and more reliable data, and are especially efficient when carried out from D&S IFCA's RIB; using the RIB as an observer platform reduces the time taken to conduct each survey, is seen as safer than surveys on board fishing vessels, and can be effectively combined with other patrol and enforcement work.

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

1. Is the activity 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 • Removal of target species • Removal of non-target species **See Annex 6 for pressures audit trail**	
3. Is the feature potentially exposed to the pressure(s)?	**Yes,** D&S IFCA has a potting permit byelaw and through this can gauge where future changes or developments in this activity occur within Plymouth Sound and Estuaries EMS. D&S IFCA has introduced management for the wrasse fishery (section 4). The Dockyard Port of Plymouth Order 1999 prohibits fishing in some areas of the SAC.	
4. What are the potential effects/impacts of the pressure(s) on the feature, taking into account the exposure level?	Up to four commercial vessels annually are known to pot for wrasse within the SAC. This year (2021-22) the fishery will comprise of 2–3 vessels. 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). Fish traps are not believed to be set on intertidal rock due to the level of access by boat. Effects of wrasse removal on the rock features with which they are associated is unclear as their ecological importance has not been quantified. D&S IFCA is liaising with a PhD student at the University of Exeter whose research seeks to fill some key knowledge gaps. Given these knowledge gaps, D&S IFCA is taking a precautionary approach to managing the wrasse fishery, by acknowledging that maintaining wrasse stocks within the SAC could be important to the ecological function of the rocky reef ecosystem, despite the current lack of an evidence base to confirm that this is the case.	
5. Is the potential scale or magnitude of any effect likely to be significant?	**Alone**	**Uncertain,** an interaction is present between fishtraps and the reef feature/sub-features of Plymouth Sound SAC. Fishtraps have the potential to impact infralittoral and circalittoral rock. It is unknown what impact the removal of wrasse will have on the reef habitat.
	In-combination	**See section 8 for more information**
6. Have NE been consulted on this LSE test? If yes, what was NE's advice?	D&S IFCA received formal advice from NE on a TLSE and HRA in 2016, then again in 2020 for a revised version. The formal advice supported the outcome of those assessments. NE's comments on the 2020 revised HRA are available in Annex 2. This iteration has not yet been consulted on.	

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 (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**
Reefs; Large shallow inlets and bays • Circalittoral rock • Infralittoral rock	**Target Attribute:** Maintain the total extent, spatial distribution and types of reef (and each of its sub-features) subject to natural variation in sediment veneer. **Conservation Objective:** Maintain or restore the extent and distribution of qualifying natural habitats and habitats of the qualifying species.	Abrasion/ disturbance of the substrate on the surface of the seabed.	The distribution of reef feature can be seen in Annex 3 (Figure 2). The use of fish traps would not have an effect on the extent or distribution of the circalittoral and infralittoral rock.	No exposure	No mitigation necessary

Reefs; Large shallow inlets and bays • Circalittoral rock • Infralittoral rock	**Target Attribute:** Maintain the presence and spatial distribution of reef (infralittoral & circalittoral rock) communities **Conservation Objective:** Maintain or restore the extent and distribution of qualifying natural habitats and habitats of the qualifying species. **Target Attribute:** Maintain the species composition of component communities. **Conservation Objective:** Maintain or Restore the structure and function (including typical species) of qualifying natural habitats.	Abrasion/ disturbance of the substrate on the surface of the seabed.	Disturbance and abrasion of the substrate could occur from gear landing on the seabed, the movement of the gear from tide, current and storm activity and the subsequent recovery of gear from the pots dragging along the sea floor when unable to lift vertically (Eno *et al.*, 2001; Coleman *et al.*, 2013). Long-lived, sessile fauna are the non-target organisms considered to be at most risk from potting. Vulnerable species include the pink sea fan (*Eunicella verrucosa*, dead man's fingers (*Alcyonium digitatum*) ross coral, (*Pentapora fascialis*) and various erect branching sponges (*e.g. Axinella* spp., *Raspalia* spp.) (Coleman *et al.*, 2013). The component communities of Plymouth Sound SAC are red algae communities for infralittoral rock, dominated by A3.214 *'Laminaria hyperborea* and foliose red seaweeds on moderately exposed infralittoral rock' (Natural England, 2015a). Faunal communities for circalittoral rock include; on the open coast a range of circalittoral biotopes within A4.13 'Mixed faunal turf communities' occur, often dominated by bryozoans, anemones or sponges. Typical communities characterising circalittoral rock within Plymouth Sound include the biotope A4.2511 'Cushion sponges, hydroids and ascidians on turbid tideswept sheltered circa-littoral rock', which is found at Firestone Bay and Devil's Point from 10m to below 20m below chart datum. The diversity of geology at outer sound sites is key to rich assemblages that can be characterised by dead man's fingers *Alcyonium digitatum* (Natural England, 2015a). Eno *et al.* (2001) studied the effects of lobster and crab pots in Lyme Bay and west Wales. The rocky habitats and communities appeared to have little or no immediate effect by the fishing activity (equivalent to around 1,000,000 pot hauls per km² per year). Immediate effects of hauling pots showed evidence of *E. verrucosa* bending under the weights of pots as and returned upright once passed, although some detachment of ascidians and sponges were noted and individual *P. fascialis* colonies were damaged (Eno *et al.*, 2001). However, long term damage from on-going activities was not accounted for in this study, in which potting occurred over one month. Other than the damage caused to individual ross corals this study concluded that short-	Up to four commercial vessels are known to pot for wrasse within the SAC in D&S IFCA District each year. Wrasse are generally targeted on the infralittoral rock sub-feature. The fishery usually operates between March and November (except in bad weather and during the closed season May 1st – July 15th inclusive, implemented to protect spawning individuals). Transport documents from each landing are received from the MMO/ salmon farm agent. The data from fishery observer surveys include catch composition by species and size distribution, and allow for catch per unit effort (CPUE) and landings per unit effort (LPUE) to be determined on a species-by-species basis. CPUE and LPUE	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 D&S IFCA deems it necessary. The permitting system allows for adaptive management. D&S IFCA has introduced permit conditions under the Potting Permit Byelaw for the management of the Live Wrasse Fishery (see section 4). This approach allows for flexible and relatively rapid review of the Potting Permit Conditions.

			term impacts of potting were insignificant and that habitats and their communities appear unaffected by potting, however it could not be determined as to how repeated “hits” would affect more resilient species and communities as a whole in the long term. Other limitations of the study include no control sites that had not previously been subject to fishing activities. A four year study by Coleman *et al.* (2013) in Lundy Island No Take Zone (NTZ) compared benthic assemblages inside the NTZ with areas nearby still subject to potting (equivalent to approximately 2,000 pots per km² per year) by scuba divers. Potting had no detectable effect on reef epifauna over the timescale of the experiment and can be considered to have limited impact (Coleman *et al.*, 2013). Limitations of this study include the experimental pots were set for five days in June and July every year for four years, which is not a good representation of fishermen’s effort intensity. There were natural environmental differences between the control (west of Lundy) and NTZ sites (east of Lundy) of depth, wave exposure and rock type. Additionally, the results were based on the hypothesis of detectable effect after four years and recovery could take a lot longer. D&S IFCA commissioned a PhD project, part of which looked at the impact of inkwells and parlour pots on reef features within the Start Point to Plymouth Sound and Eddystone SAC. The effects of pots landing, movement, rope scour and hauling were monitored using video cameras. Only the rims of the pot come into contact with the seabed (not the whole base) and took on average 3.5 seconds to settle (Gall, 2016). The study found that the pots are fairly stationary during the time they are on the seabed (for 25 minutes), with 86% of soaks showing no movement and 8% of soaks with some occasional movement which were very sporadic and small. Only one pot made large movements throughout the soak. When hauling, the pots do not drag for long distances on the seabed. Pots took 41 seconds to haul and the total time that the pots came into contact with the seabed was approximately half the time (20.7 seconds). Rope movement was minimal, only moving slightly by the tide and no	data will help inform assessment of stock abundance and highlight changes over time, as outlined in the most recent D&S IFCA’s report on this fishery (Annex 7), and in Henly *et al.* (2021). Wrasse are also assessed for spawning status when possible to monitor the effectiveness of the closed season. The Minimum and Maximum Conservation Reference Sizes introduced for all species allow for a degree of protection of both young and mature, reproducing individuals, thereby affording protection to the breeding stock. The closed season, timed to account for wrasse spawning seasons, will allow some spawning to occur before harvesting, and allow nests to be protected. Triggers that would initiate a review of management include:	

			scour or species impacts were observed for 46% of the time. In instances where movement and impact occurred abrasion was found on *A. digitatum* and *E. verrucosa*, although no individuals were removed. However, during hauling, five instances occurred where damage caused abrasion and removal of two *A. digitatum*. The assumed haul corridor (area that could be impacted during hauling) was 6.7m² and the length of the realised haul corridor (area actually impacted) was 3.2m² (Gall, 2016). Of the 22 taxa identified, 14 suffered damaged from pot impacts, including all five indicator taxa, and individuals of six were removed from the reef, including one indicator taxa. Pots for wrasse have to have limited/ to no movement on the seabed otherwise wrasse will not enter the pot (Cornwall IFCA 2016, pers. comms.). Walmsley *et al.* (2015) reviewed literature and the evidence indicated no significant impacts from potting have been found on benthic species and communities of reefs, although there are site-specific considerations. Wrasse are found among rocky and seaweed covered areas inshore and in seagrass beds, and therefore these are the habitats the fishermen target for wrasse. Algal communities associated with infralittoral rock should be less sensitive to disturbance from potting because of their annual life-cycles and relatively fast growth rates (Coleman *et al.*, 2013) when compared to circalittoral rock which can have more slow growing and fragile species. Walmsley *et al.* (2015) reviewed literature of potting impacts and found no primary literature on the impacts on potting on kelp communities. An unpublished master's thesis assessed the impact of potting on chalk reef communities in Flamborough Head EMS (Young, 2013: reviewed by Walmsley *et al.* 2015). A statistically significant difference in community assemblage was identified between NTZ and fished sites. A higher abundance of benthic taxa, namely Mollusca, Hydrozoa and Rhodophyta was identified inside the NTZ. A higher abundance of kelp	1) Any increase in effort (number of boats). 2) Failure to meet all permit 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 consistent decrease in CPUE or LPUE . 6) A shift in size distribution. Data collected from fishermen, on-board surveys and fishermen's conduct will inform the review of the permit conditions. Detailed information on the wrasse fishery can be seen in the PDFs attached at the end of Section 4 (Page 11). There is no literature on the impact of wrasse pots or fish traps on infralittoral or circalittoral rock. The traps used to catch wrasse are lightweight (3.7kg), specially-	

			Sacharinna latissimi was observed in the fished site compared to the NTZ. This was inconsistent with other taxonomic groups observed. However, there are limitations of the results due to adverse weather which scoured the seafloor in both sites and surveys were conducted at different states of tide which affected visibility in the fished site.	designed parlour pots (Figure 1). 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).	
Reefs; Large shallow inlets and bays • Circalittoral rock • Infralittoral rock	**Target Attribute:** Maintain the presence and spatial distribution of reef (infralittoral & circalittoral rock) communities **Conservation Objective:** Maintain or restore the extent and distribution of qualifying natural habitats and habitats of the qualifying species. **Target Attribute:**	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*) and corkwing (*Symphodus melops*). Rock cook (*Centrolabrus exoletus*) have previously been targeted in the D&S IFCA's District. However, in response to data gathering and reporting by D&S IFCA Officers, and following a period of public consultation, the B&PSC confirmed a change to the Potting Permit Conditions (on 18th June 2020), which now prohibit the removal of rock cook from the fishery. 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 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	See row above for more information.	See row above.

	Maintain the species composition of component communities. **Conservation Objective:** Maintain or Restore the structure and function (including typical species) of qualifying natural habitats.		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. The minimum size for wrasse used in salmon cages is 12cm. The removal of larger (>12cm) fish has the potential to alter population structures (Darwall *et al.*, 1992) in wild populations. Size at maturity is ~10cm in goldsinny and corkwing wrasse, which is smaller than the current minimum conservation reference size in D&S IFCA's District; this may encourage sustainable populations by allowing some individuals to mature and reproduce. Due to the mature individuals being targeted the average size and age at first maturity may 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 may be removed before having a chance to spawn. Cuckoo wrasse are not targeted by the fishery, and the change in the ballan wrasse CRS range to 18–26 cm is likely to overcome this issue: it will not only shift some of the fishing effort away from the smaller, recently mature females (giving this size class a chance to contribute to overall stock recruitment) but is also likely to continue to protect many of the larger, more fecund mature females (>26 cm). 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-Ríos *et al.*, 2013b), 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 (Villegas-Ríos *et al.*, 2013b; Almada *et al.*, 2016). 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.* (Halvorsen *et al.*, 2017) 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.*, 2017). ***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-Ríos		

			et al., 2013a). 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.*, 2016). 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). Assessment of spawning state of wrasse during D&S IFCA's survey work, including fishery-independent surveys, has informed the current closed season of 1st May – 15th July each year. This closed season has been implemented, under Potting Permit Conditions, to encourage protection of spawning individuals during this time. ***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-Ríos *et al.*, 2013a), territories of up to 2m² for goldsinny (Hilldén, 1981) and >15m² for corkwing (Costello *et al.*, 1997) 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 (Cowx *et al.*, 2003) 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.*, 2012). 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. A PhD student at the University of Exeter is investigating the population structure of wrasse along the south coast of England using genetic techniques. **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). Hildén (1983) observed ballan wrasse enter goldsinny territory and adopt an invitation posture, before		

			being cleaned by the resident goldsinny in Sweden. Hildén (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. Corkwing, 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 (Hilldén, 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). 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). Algae forms part of the diet of all five wrasse species, but corkwing wrasse also utilise multiple algae species to make complex nests (Potts, 1985). Corkwing wrasse are highly selective of which species are used in the formation of the nests. One of the research projects being undertaken by a PhD student at the University of Exeter seeks to determine the degree of dietary overlap between species of wrasse, in order to assess whether there is a degree of functional redundancy between these species. ***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, 2017). 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). **<u>Non-target species:</u>** 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 benthic sessile fauna, Eno *et al.* (2001) found some detachment of ascidians and sponges, and individual *P. fascialis* colonies were damaged by potting activity (Eno *et al.*, 2001). See row above for more information on changes to abundance and community assemblage from potting.		

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 if the gear is dragged laterally when retrieved. 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). Studies by Coleman *et al*. (2013) and Eno *et al.* (2001), both found epifaunal assemblages suffered little impact from pots and traps and could be considered generally insensitive to commercial potting. Walmsley *et al.* (2015) reviewed existing evidence and on-going studies to provide conclusions of whether potting could compromise the achievement of conservation objectives. The review concluded there was low to no sensitivity/impact on reef features from potting, and the wrasse pots used are lightweight, much lighter that pots used to target crustacea, and therefore may have less of an impact. 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. A final summary of the evidence supporting this conclusion is detailed below, and an outline of the data collection and adaptive management commitments that will continue to support this conclusion is provided.

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 may 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 wrasse fishery in Plymouth is largely unknown except through IFCA monitoring and subsequent publications (e.g. (Henly *et al.*, 2021), and the need to collect data on the effort and the potential impacts is recognised. D&S IFCA has introduced management through permit conditions (see section 4) for the Live Wrasse Fishery. Data collection for 2021 onwards will be improved by increased coverage of observer surveys, while the data analysis has been improved by the use of advanced, peer-reviewed statistical methods as presented in Henly *et al.* (2021) and in Annex 7. The requirement for fishers to submit returns forms has been removed for 2021, which will reduce the associated administrative and time cost of monitoring, and allow greater focus on monitoring via observer surveys. The observer surveys provide much richer and more reliable data (which form the basis for all relevant analyses, Annex 7), and are especially efficient when carried out from D&S IFCA's RIB; using the RIB as an observer platform reduces the time taken to conduct each survey, is seen as safer than surveys on board fishing vessels, and can be effectively combined with other patrol and enforcement work.

The fishery is highly restricted, being one of the most regulated and managed fisheries in the country. D&S IFCA has been carrying out observer surveys to collect information about the fishery since 2017. The data collected were reviewed in annual reports produced in November 2017, November 2018, February 2020 and February 2021. The Executive Summary from the most recent report (Review of the Live Wrasse Fishery in Devon and Severn IFCA's District 2017–2020) report summarises the findings:

"A fishery for the live capture of wrasse for use as cleaner fish in Scottish salmon farms developed in the Devon and Severn Inshore Fisheries and Conservation Authority's (D&S IFCA's) District in 2015. Management was introduced in 2017 via the D&S IFCA's Potting Permit Byelaw. These management measures have been adapted since their introduction based on evidence from the analysis of data collected during observer surveys in the D&S IFCA District. These previous analyses however, were unable to consider changes in catch per unit effort (CPUE) and landings per unit effort (LPUE) whilst controlling for variation that comes about as a result of geographical

location an environmental variables. This report standardises monitoring data from the fishery observer surveys conducted by D&S IFCA's Environment Officers with fishing locations and environmental data obtained from external sources and identifies the main drivers of variation in CPUE and LPUE. Implications of the results for future management and sustainability of the fishery are discussed.

[…] "

The main drivers of variation in CPUE and LPUE varied between species. There was evidence of a decline in ballan wrasse CPUE and LPUE, particularly on the landward side of the breakwater. This decline is likely driven by the relatively high retention rate of ballan wrasse in combination with specific life history and behavioural characteristics that leave the species vulnerable to overfishing. No negative year effects were seen for the other wrasse species. There was no evidence of a decline in rock cook CPUE or LPUE across the 2017–2020 period, despite evidence of a decline highlighted in last year's report (Curtin *et al.*, 2020) that led to a prohibition on the removal of rock cook wrasse from the fishery. Rock cook CPUE and LPUE showed significant variation across broad-scale fishing areas (significantly lower in the more sheltered areas, which are protected from wind and wave exposure by the breakwater). As the majority of the observer surveys have been conducted in more sheltered locations in the last two years, it is unsurprising that the Three Year Comprehensive Review, which was not able to control for geographical variation in CPUE and LPUE, highlighted a decline in these measures over the 2017–2019 period. Goldsinny wrasse showed seasonal variation in CPUE and LPUE across the survey season (decreasing from July to October) and lower catches were observed in locations closest to the freshwater outputs of the River Tamar. These observations agree with previously reported trends in the literature that suggest goldsinny wrasse are found in their highest densities in the summer months and away from locations that are influenced by freshwater runoff. Finally, there was a significant increase in corkwing wrasse CPUE across the 2017–2020 period, along with evidence of seasonal variation in CPUE and LPUE (increasing throughout the July – October season). The change in CRS limits in 2018 has likely benefitted the species as a lower proportion of corkwing are being landed and mature individuals of each sex are likely being protected. The seasonal variation may reflect the species' spawning season and concurrent activity levels […]"

The report was presented to the D&S IFCA's B&PSC and recommendations for management changes were proposed as outlined on page 11 of this assessment. D&S IFCA has consulted on changes to the permit conditions to change the Conservation Reference Size limits for ballan wrasse from 15–23 cm to 18–26 cm. This change to the conditions was approved by the B&PSC at a meeting on 22nd July 2021. Through the 2021 consultation, concerns were raised regarding the sustainability and impacts of the fishery. D&S IFCA's Officers have addressed these concerns in a paper submitted to the Byelaw and Permitting Sub-Committee; in the interests of transparency, this paper is included here as Annex 8. Triggers that would initiate a further review of management include: any increase in effort (number of boats above four), failure to meet 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 or LPUE, and a shift in size distribution. Data from each year of the fishery (including 2021 and onwards) will continue to be reviewed at the end of each season, in order to inform management in a timely fashion.

D&S IFCA has been able to rapidly respond to evidence gathered from literature reviews, consultation and data from the Live Wrasse Fishery to apply adaptive management to prevent adverse effects of potting for Live Wrasse on attributes of EMS features. Specifically, the D&S IFCA's B&PSC recommended the change in CRS limits for ballan wrasse to 18–26 cm and the removal of the requirement for fishers to submit returns forms; these measures are in addition to the initial management measures (2017), the changes to management put in place in 2018 regarding the conservation reference sizes for corkwing and changes to the closed season, and the prohibition

on the removal of rock cook from the fishery by all permit holders put in place in 2020, as outlined on pages 9-11 of this assessment.

D&S IFCA is liaising with a PhD student at the University of Exeter who is studying the wrasse fishery. This assessment will also be reviewed should the PhD research present evidence that the fishery and its current management may be unsustainable.

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, and has been assessed by D&S IFCA. Crab tiling is not thought to occur on rock features, so no in-combination effect thought to be possible.

Digging with forks - Activity is occurring within Plymouth Sound and Estuaries EMS, though this activity is not thought to occur on rock features. Therefore, 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 low-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 wrasse pots within D&S IFCA's 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 Plymouth-based 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.

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. Static nets are rarely set directly on reef, 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.

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.

Therefore, in light of the above considerations, D&S IFCA concludes 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.

Currently there are proposed plans or projects in Plymouth Sound and Estuaries EMS which could theoretically interact with the sub-features addressed. These activities have been included following the informal advice from Natural England.

Description: Maintenance dredging within Western Mill Lake and North Yard at HMNB Devonport which is carried out twice yearly; the current marine license extends to 2028. Includes trailer suction hopper dredging carrying out the majority of maintenance and additional small-scale dredging techniques: plough, grab and submersible pump dredging. A maximum amount of 500,000m³ of silt and 50,000m³ of sand will be removed during the 10 year license period.

Pressures:

- Abrasion/disturbance of the substrate on the surface of the seabed
- Changes in suspended solids (water clarity)
- Habitat structure changes – removal of substratum (extraction)
- Litter
- Organic enrichment
- Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion
- Removal of target species
- Removal of non-target species
- Siltation rate changes, including smothering
- Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.
- Introduction of other substances (solid, liquid or gas)
- Introduction or spread of non-indigenous species
- Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.
- Transition elements & organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.

In-combination assessment: At the current 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.

Description: Previously, D&S IFCA have granted dispensation for annual Marine Biological Association (MBA) scientific survey work on research vessel Sepia within the EMS to fish for

scientific purposes. Activity involving 4m beam trawl in West Mud (Tamar) and Yealm Mouth, demersal otter trawl in Bigbury Bay, and rectangle dredge in New Ground (Plymouth Sound), Mewstone and Stoke Point. Following further review of this dispensation for interactions with all sensitive features, the only activity now allowed for the MBA under exemption from D&S IFCA Byelaws is demersal otter trawl in Bigbury Bay.

Pressures:

- Abrasion/disturbance of the substrate on the surface of the seabed
- Changes in suspended solids (water clarity)
- Litter
- Organic enrichment
- Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion
- Removal of target species
- Removal of non-target species
- Siltation rate changes, including smothering
- Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.
- Introduction of other substances (solid, liquid or gas)
- Introduction or spread of non-indigenous species
- Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.
- Transition elements & organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.

In-combination assessment: Following a separate HRA and MCZ assessment for this activity, D&S IFCA concludes that it is unlikely that in-combination effects will lead to the conservation objectives not being met for the features assessed.

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 concludes 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. A reassessment for fishtraps was sent for informal advice to Natural England in April 2017 (version 2) after new information revealed an emergent Live Wrasse Pot Fishery. Version 3 contained amendments from the informal advice received from Natural England, and updated management measures. Version 4 (August 2020) accounted for the changes that occurred in the two years since version 3 (2018-2020), including the completion of the Comprehensive Review of the Live Wrasse Fishery and changes in management of the fishery implemented over time. This version (version 5; 2021) accounts for recent assessments of the fishery (Henly and Stewart, 2021a, 2021b; Henly *et al.*, 2021), in addition to changes to relevant management measures. Cuttlepots have been assessed in a separate HRA.

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 assessed sub-features 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's Potting Permit Byelaw the number of potters in the District can be monitored. The permitting system allows for adaptive management and changes have been made to the permit conditions, via a consultation.

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Annex 2: Previous HRA version and Natural England's Advice


Plym SAC Rock vs fishtraps v4 final.pdf


320633_NE advice to DS IFCA_FishTraps 202

Annex 3: Site Map

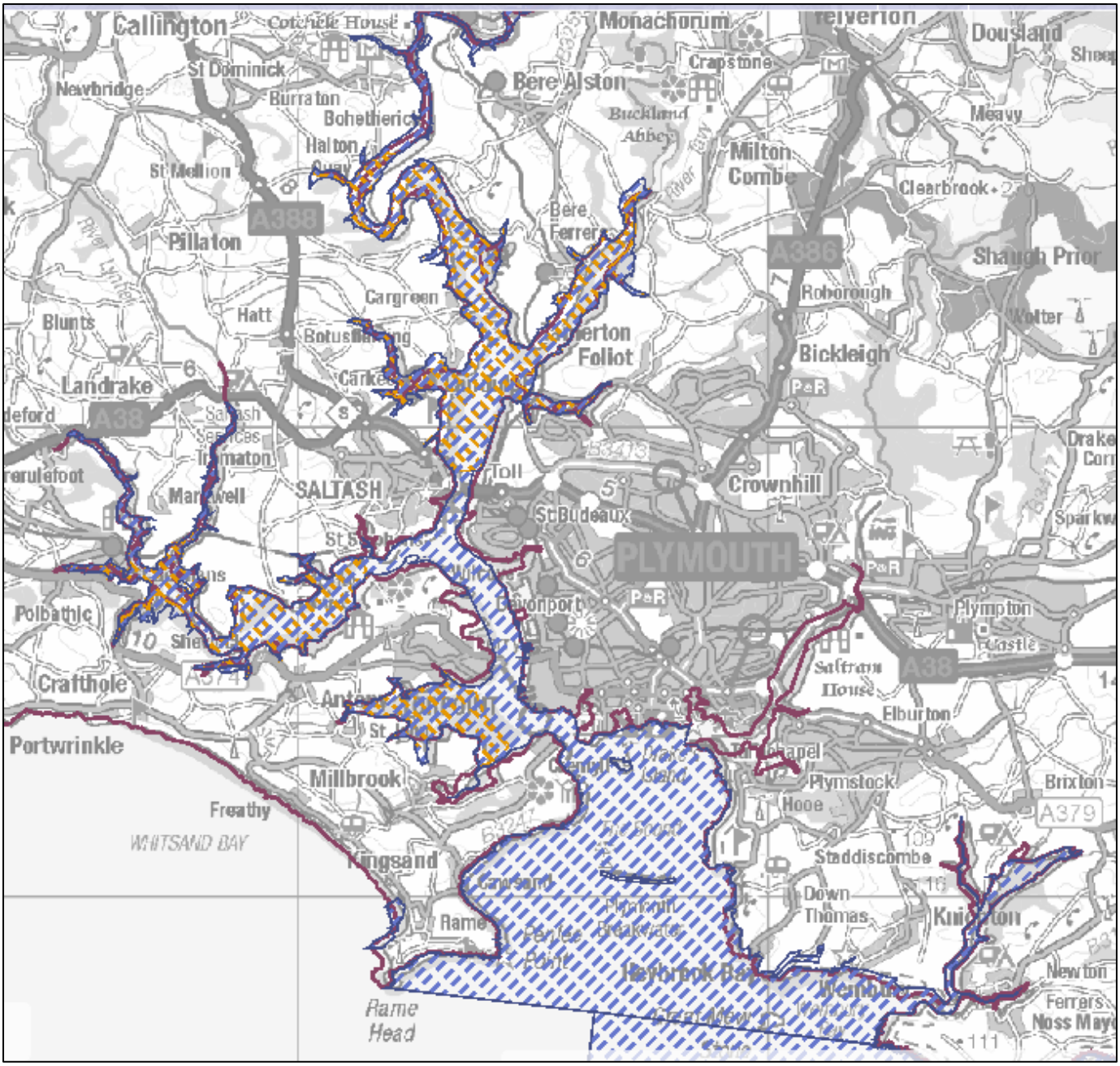

Figure 1 - Area of SAC (blue hatched) and SPA (Orange hatched) (MAGIC, 2015)

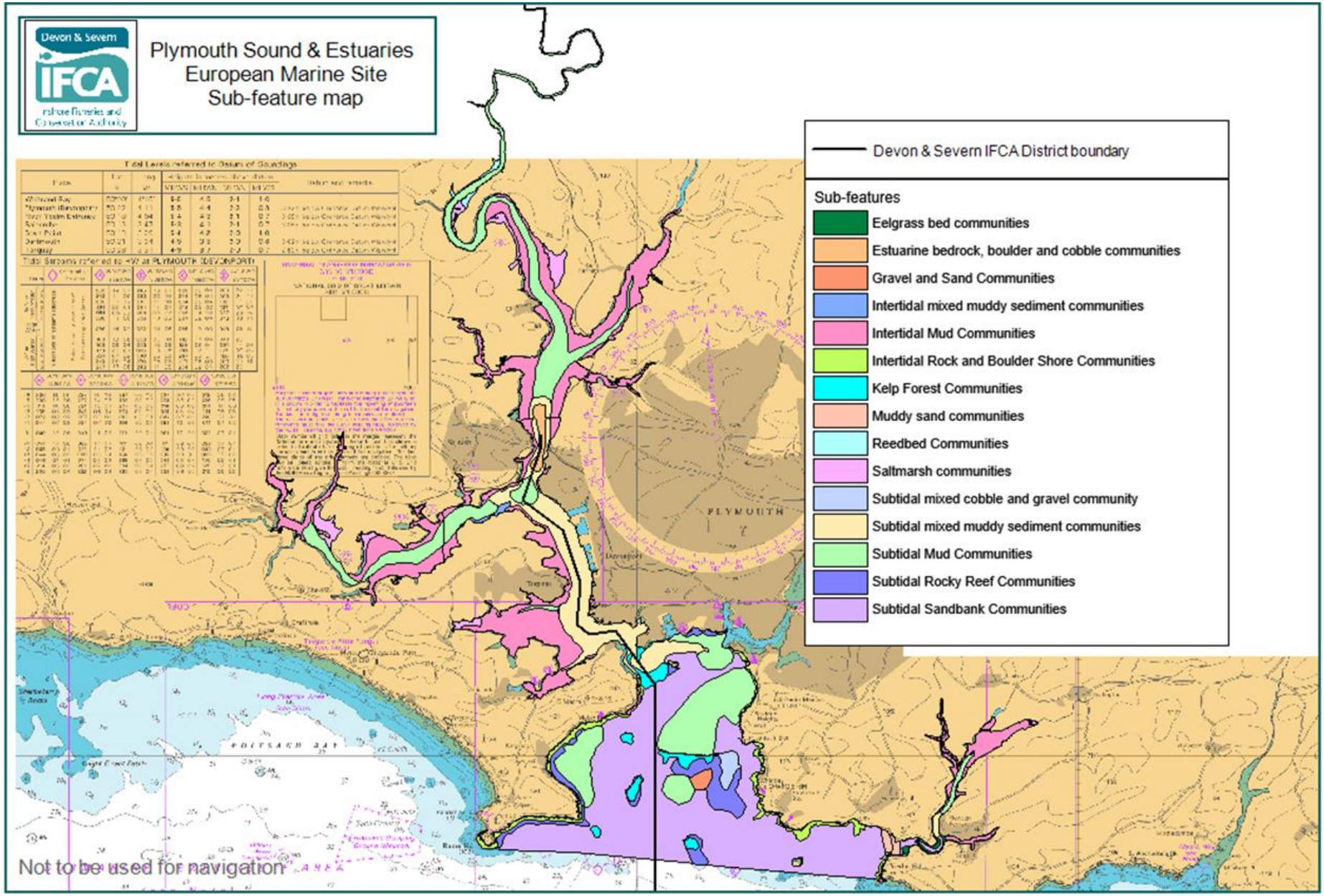

Figure 2 - Plymouth Sound & Estuaries EMS sub-features

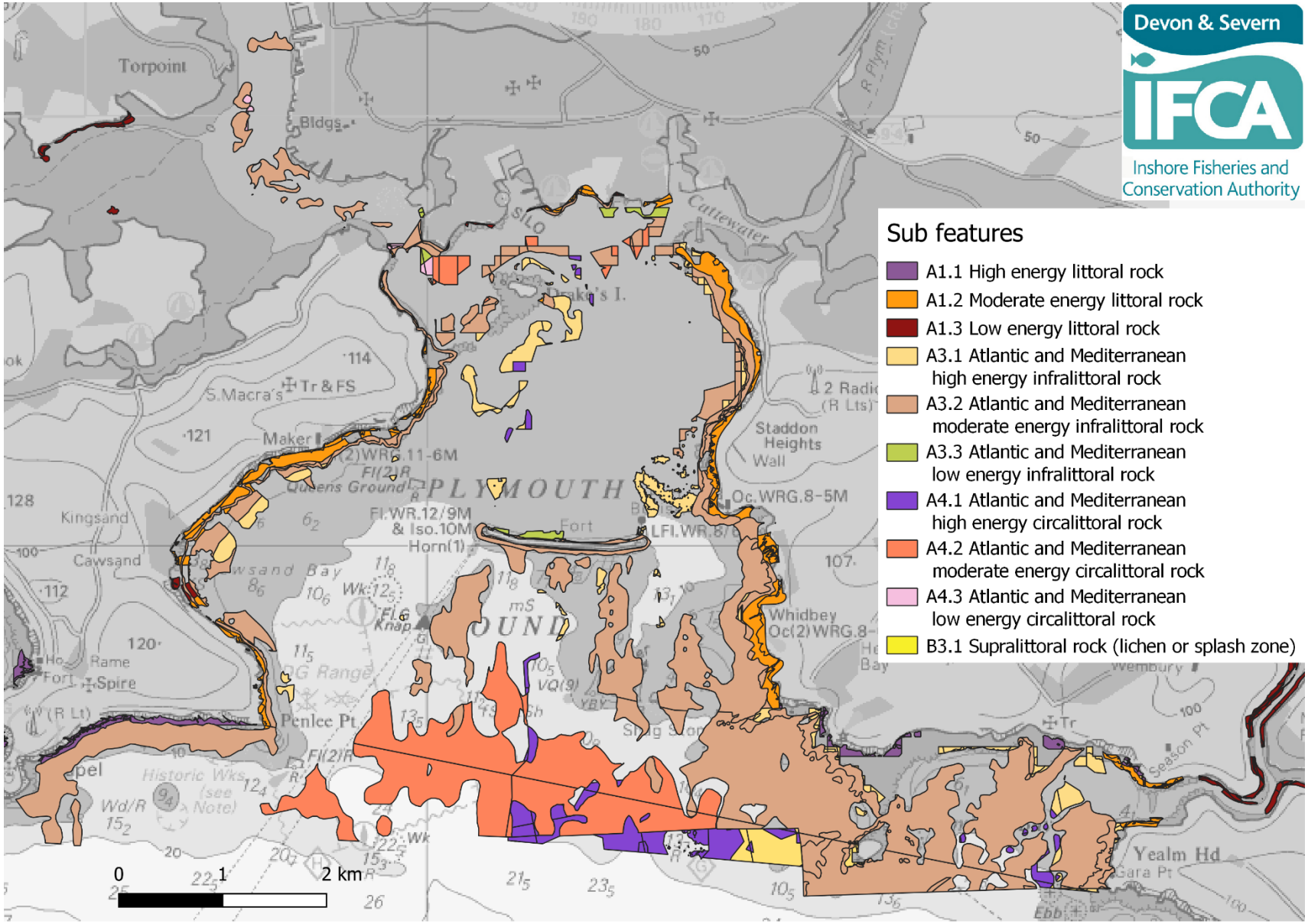

Figure 3: Plymouth Sound and Estuaries rock sub features

Annex 4: Fishing activity maps

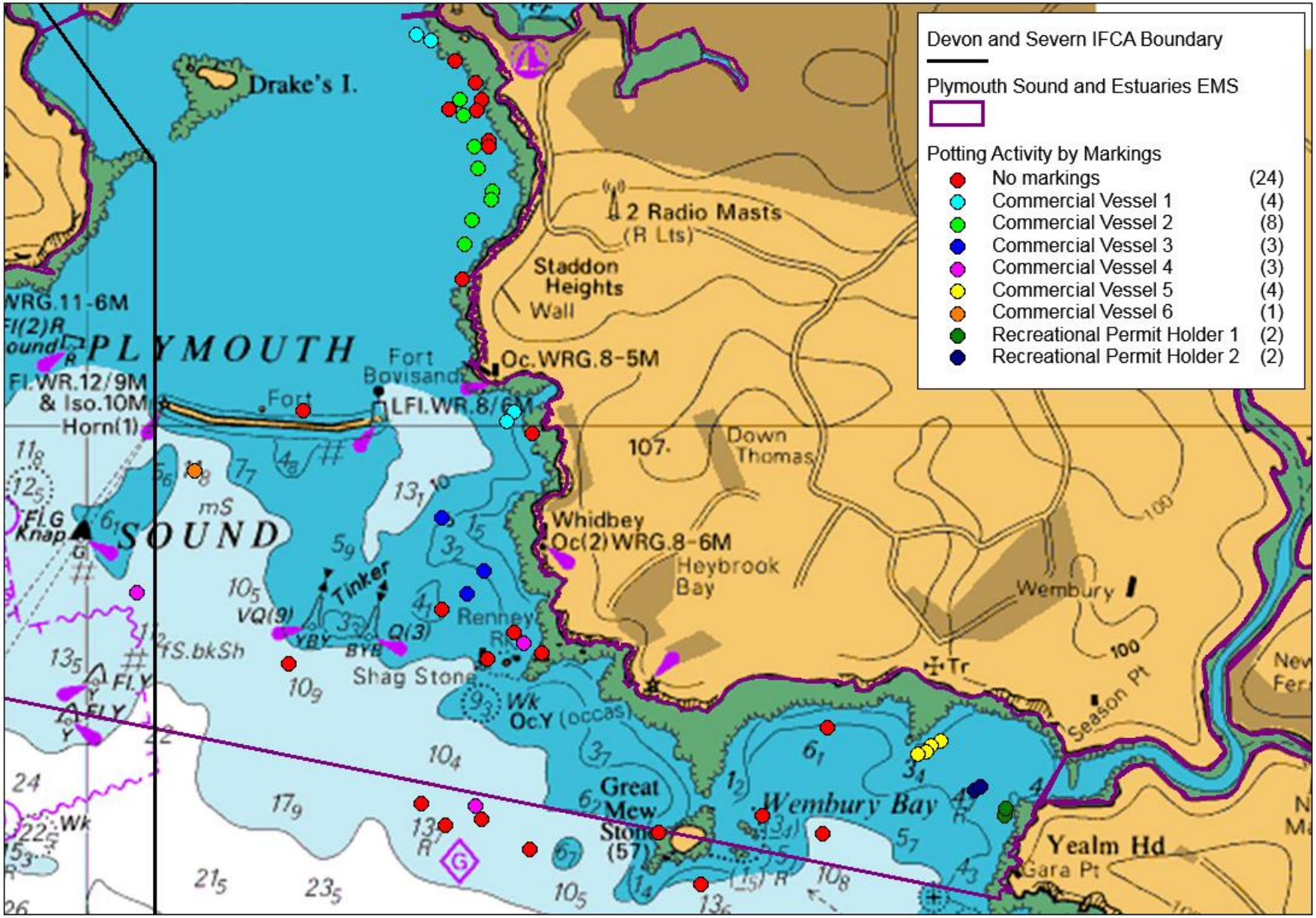

Figure 1 - Potting activity (markings on buoys) recorded within and near Plymouth Sound and Estuaries EMS in May 2016.

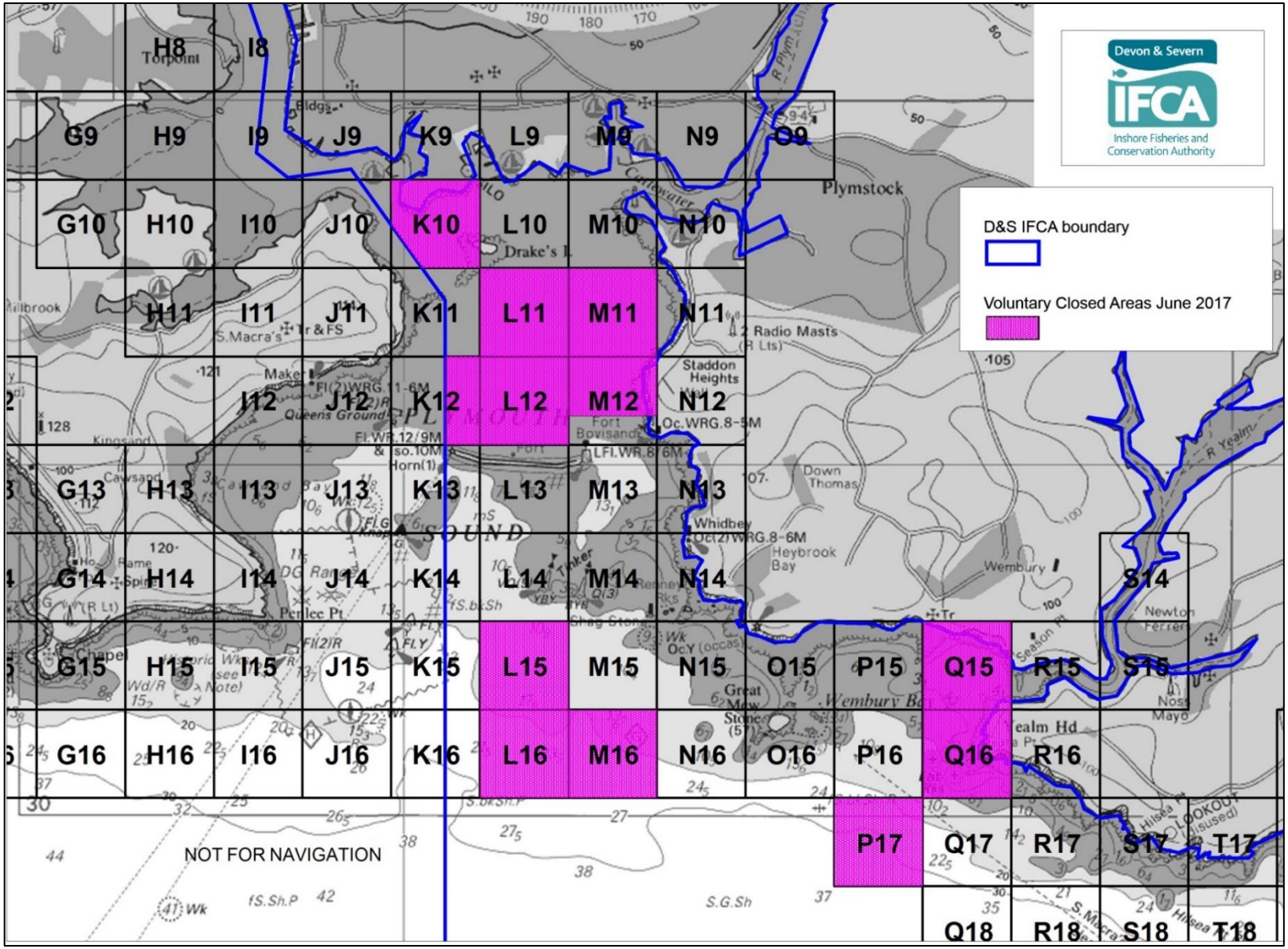

Figure 2 - Voluntary closed areas to the Live Wrasse Fishery (implemented end of June 2017). The eastern extent of the fishery is the same as that presented in Figure 3, below.

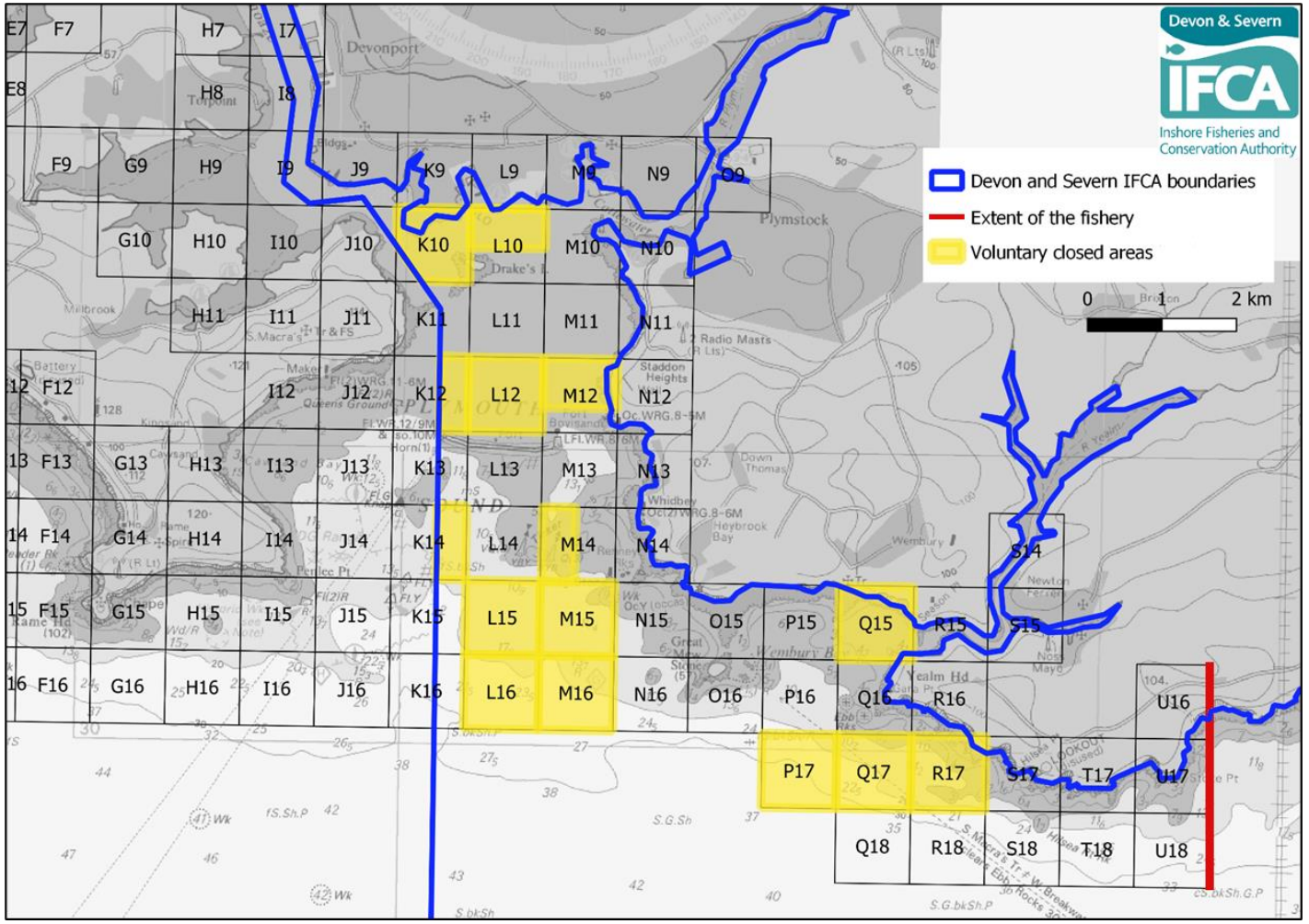

Figure 3 - Voluntary closed areas to the Live Wrasse Fishery (implemented 2018, superseding previous closed areas)

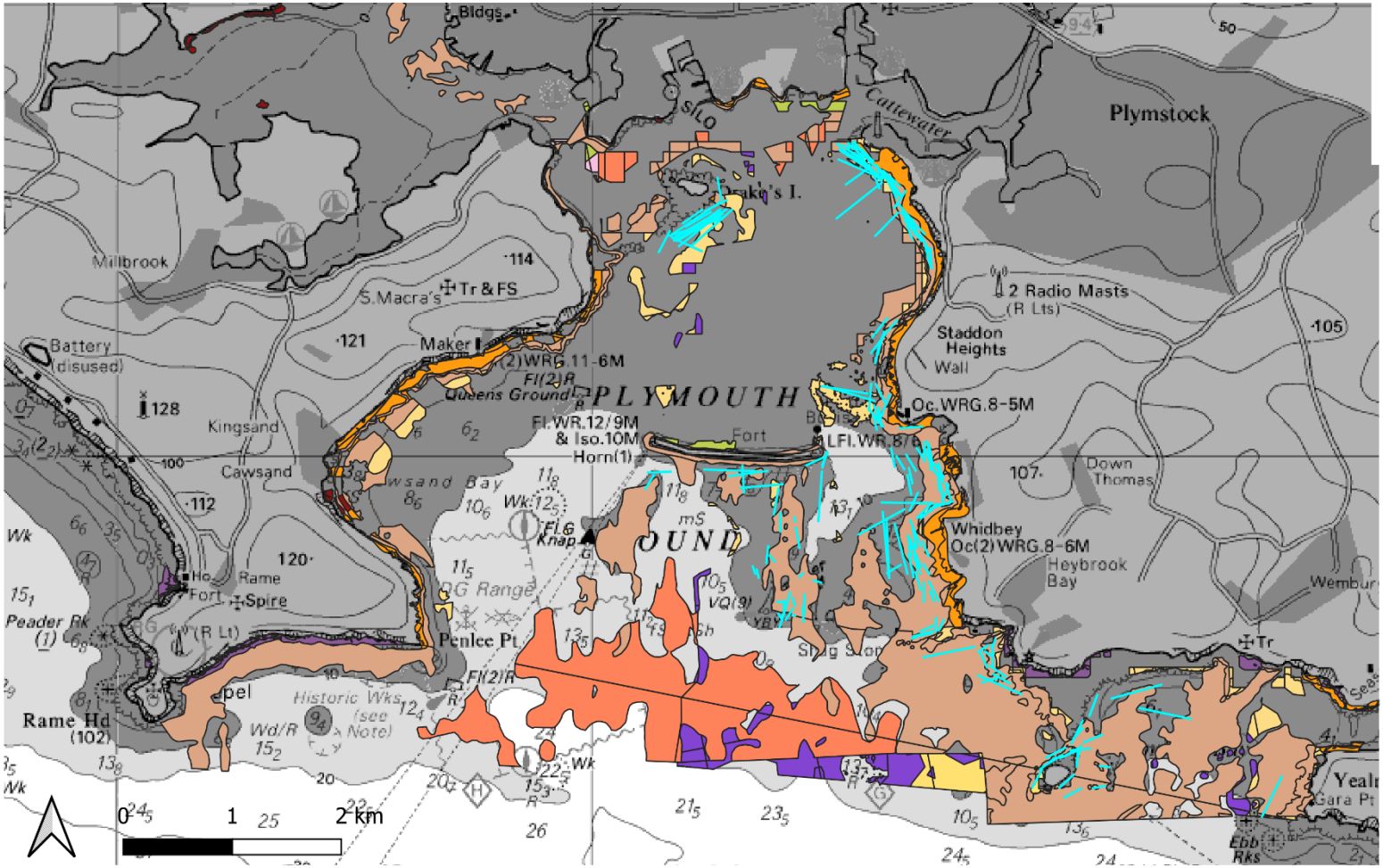

Figure 4 – Strings of wrasse pots surveyed during on board wrasse surveys during 2017–2019, superimposed on rock sub-features of Plymouth Sound and Estuaries SAC.

Annex 5: Mobile Fishing Permit Byelaw map

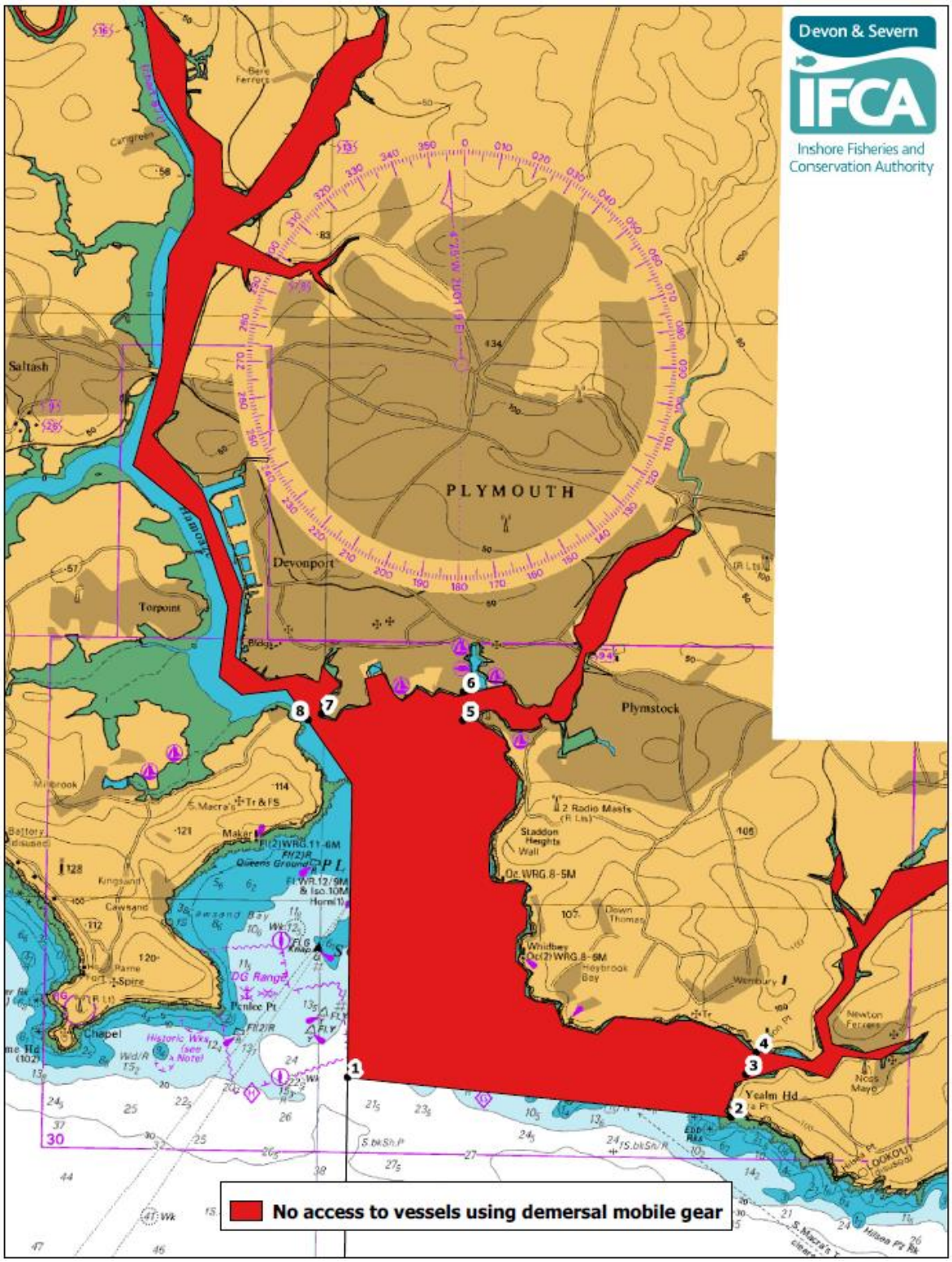

Figure 1. There is no access to demersal mobile gear within the areas of Plymouth Sound and Estuaries shown by the red bounding polygon. Coordinates of this area, marked by numbers in white circles, are given below.

Latitude and Longitude positions marked on Figure 1 (Annex 5) above:

Point Number	Latitude			Longitude		
1	50°	18.484’	N	004°	09.600’	W
2	50°	18.192’	N	004°	04.458’	W

Landward boundary follows mean high water to Yealm Estuary Closing Line

Point number	Latitude			Longitude		
3	50°	18.560’	N	004°	4.268’	W
4	50°	18.749’	N	004°	4.133’	W

Landward boundary follows mean high water to Plym Estuary Closing Line

Point number	Latitude			Longitude		
5	50°	21.556’	N	004°	8.130’	W
6	50°	21.801’	N	004°	8.130’	W

Landward boundary follows mean high water to Tamar Estuary Closing Line

Point number	Latitude			Longitude		
7	50°	21.592’	N	004°	10.026’	W
8	50°	21.540’	N	004°	10.206’	W

Point 8 returning to point 1 is the Western District boundary.

Annex 6: Pressures Audit Trail

Traps Pressure(s)	Sub-feature		Screening Justification
	Infralittoral rock	Circalittoral rock	
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	**IE**	**IE**	**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**	**IE**	**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 significant risk 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 target species	**Revised pressure – no sensitivity currently available**		**IN** – Need to consider spatial scale/intensity of activity to determine likely magnitude of pressure
Removal of non-target species	**S**	**S**	**IN** – Mortality from very low incidental by-catch
Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.	**NS**	**IE**	**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**	**IE**	**OUT** - Insufficient activity levels to pose risk of large scale pollution event

Annex 7: Review of the Live Wrasse Fishery in Devon and Severn IFCA's District 2017–2020

The Live Wrasse Fishery 2017-2020 v1

SummaryReport_WrasseReview2017-202

Annex 8: Paper provided to D&S IFCA's Byelaw and Permitting Sub-Committee, addressing concerns raised in the 2021 consultation on Amendments to the Permit Conditions to Manage the Live Wrasse Pot Fishery

B&PSC Wrasse & Potting Formal Cons