



Isles of Scilly Marine Biodiversity Project

Isles of Scilly Fish and Fisheries



Photo © Angie Gall/ Isles of Scilly Marine Biodiversity Project

December 2010

Douglas Herdson

Marine Fish Information Services
94 Dunstone View
Plymstock
Plymouth. PL9 8QW
Douglas.Herdson@btinternet.com
+44(0)1752 405155

Isles of Scilly Marine Biodiversity Project is funded by Natural England and the Crown Estate.

Contents

1) <u>Introduction</u>	6
2) <u>Work done</u>	6
2.1) Interviews	6
2.2) Publicity	7
2.3) Recording Scheme	7
2.4) Study of the fishing fleet	8
2.5) Study of shore fish	9
2.6) Review of literature and records	9
3) <u>Overview</u>	9
4) <u>Areas and habitats</u>	11
4.1) Intertidal	11
4.1.1) Boulder shores	11
4.1.2) Intertidal sandflats	11
4.2) Inshore	11
4.2.1) Eastern sector	11
4.2.2) North	11
4.2.3) North west	11
4.2.4) West	
4.2.5) Mud patch	12
4.2.6) Poll Bank	12
4.2.7) South	12
4.2.8) Crow Sound	12
4.2.9) The Flats	12
4.2.10) Tide-swept Channels	12
4.3) Offshore	12
4.3.1) North and north west	13
4.3.2) South and south west	13
5) <u>Fisheries and Fishing methods</u>	13
5.1) Trawling	14
5.1.1) Otter trawling	14
5.1.2) Beam trawling	14
5.2) Scallop dredging	14
5.3) Netting	14
5.3.1) Pollack nets	15
5.3.2) Ray or tangle nets	15
5.3.3) Trammel nets	15

5.3.4) Mullet nets	15
5.4) Potting	16
5.4.1) Inkwell pots	16
5.4.2) Parlour pots	16
5.4.3) Soft-eye pots	17
5.5) Bait	17
5.6) Shrimping	17
5.7) Mariculture	18
5.8) Angling	18
5.8.1) Shore angling.	18
5.8.2) Boat angling.	18
5.9) Spearfishing	19
6) <u>Fish processing and supply to the islands</u>	19
7) <u>Research Surveys</u>	19
8) <u>Communities</u>	20
8.1) Boulder coasts	20
8.1.1) Intertidal. (BAP habitat)	20
8.1.2) Subtidal.	21
8.2) Rocky coasts	21
8.2.1) Coastal	21
8.2.2) Fragile sponge and coral communities subtidal rock. (BAP habitat)	21
8.2.3) Offshore rocky reefs.	22
8.3) Tide-swept channels. (BAP habitat)	22
8.4). Stone and sand	22
8.5) Sand	23
8.5.1) Intertidal sandflats.	23
8.5.2) Sandy Bays	23
8.5.3) Subtidal Sands (BAP habitat)	23
8.6) Seagrass beds (BAP habitat)	24
8.7) Subtidal Mud	24
8.8) Offshore grounds	25
8.9) Open water	26
8.10) Mooring and pot ropes	26
9) <u>Species and Group accounts</u>	28
9.1) European Spiny Lobster <i>Palinurus elephas</i> (BAP species)	28
9.2) Slipper Lobster <i>Scyllarus arctus</i>	28
9.3) Kuruma Prawn <i>Marsupenaeus japonicus</i>	29
9.4) Curled Octopus <i>Eledone cirrhosa</i>	29

9.5) Sharks	30
9.5.1) Basking Shark <i>Cetorhinus maximus</i> (BAP species)	30
9.5.2) Porbeagle <i>Lamna nasus</i> (BAP species)	30
9.5.3) Blue Shark <i>Prionace glauca</i> (BAP species)	30
9.5.3) Small Sharks	30
9.5.4) Angel Shark <i>Squatina squatina</i> (BAP species)	30
9.6) Rays	31
9.6.1) Common Skate <i>Dipturus batis</i> complex (BAP species)	31
9.6.2) Other rays, Rajidae	31
9.7) European Sturgeon <i>Acipenser sturio</i> (BAP species)	31
9.8) European Eel <i>Anguilla anguilla</i> (BAP species)	32
9.9) Conger Eel <i>Conger conger</i>	32
9.10) Allis Shad <i>Alosa alosa</i> (BAP species)	32
9.11) Atlantic Salmon and Sea Trout <i>Salmo salar</i> and <i>Salmo trutta</i> (BAP species)	33
9.12) Grey Mullet, Mugilidae	33
9.13) Small pelagic fish (BAP species)	33
9.14) Round Fish	34
9.15) Flatfish, Pleuronectiformes	35
9.16) Seahorses, <i>Hippocampus guttulatus</i> and <i>Hippocampus hippocampus</i> (BAP species)	36
9.17) Sandeels, Ammodytidae	36
9.18) Gobies, Gobiidae	37
9.19) Grey Triggerfish <i>Balistes capriscus</i>	40
9.20) Pearlside <i>Maurolicus muelleri</i>	40
10) <u>Spawning and Nursery areas</u>	41
10.1) Grey Mullet, Mugilidae	41
10.2) Plaice, <i>P. platessa</i>	41
10.3) Brill, <i>Scophthalmus rhombus</i>	41
11) <u>Sustainability</u>	42
11.1) What makes fishing “sustainable”?	42
11.1.1) Impact on the fished stock	42
11.1.2) By-catch	42
11.1.3) Environmental impact	42
11.2) Crustacean fisheries	43
11.2.1) Crab and Lobster	43
11.2.2) Crawfish	43
11.3) Fish	43
12) <u>Acknowledgements</u>	45

APPENDICES	46
A) <u>Fish and shellfish of the Isles of Scilly</u>	46
B) <u>Bibliography on the Fish and Fisheries of the Isles of Scilly</u>	49
C) <u>Fishing vessels of Isles of Scilly (2010)</u>	54
D) <u>Recording Forms</u>	57
D.1) Fish and Shellfish Landings	57
D.2) Fish Report Form	58

1) Introduction

The Fish and Fisheries study has been carried out as part of the Isles of Scilly Marine Biodiversity Project, over the period from April 2009 to October 2010.

The objectives of the study were –

- To gather an overview of the abundance, distribution and ecology of the marine fish fauna of the islands with particular reference to Biodiversity Action Plan (BAP) species and those fish occurring in BAP habitats.
- To investigate the fishing fleet of the Isles of Scilly, the fishing methods and their catches.
- To promote the study, and consequently the fish and fishing around the islands, and involve the local people; through media contacts.
- To set a baseline for ongoing monitoring and future studies, and to identify threats, challenges and opportunities for marine biodiversity in the islands.
- To set up a recording system to assist with these objectives.
- To collect information to assist with the establishment of a well managed Marine Conservation Zones in the Isles of Scilly.

2) Work done

During the 25 days of the contract (spread over 18 months) three visits (totalling 17 days) were made to the Isles of Scilly.

2.1) Interviews

A large numbers of informal interviews were carried out with stakeholders in the marine environment, mainly in person, but also over the telephone and through colleagues. These were with

- Personnel of the Marine Management Organisation (MMO) (Newlyn Office) (originally the Marine and Fisheries Agency), the Isles of Scilly Sea Fisheries Committee, Environment Agency and Finding Sanctuary.
- Fishermen and fish retailers.
- Anglers, charter boat skippers and the tackle shop owner.
- Dive companies and divers.
- Marine biologists and naturalists.
- General public

From this a directory of contacts was constructed.

2.2) Publicity

In order to promote the Isles of Scilly Marine Biodiversity Project

- Two posters were prepared for display at Land's End Airport, Penzance Heliport, on the Scillonian III, outside the Trust's office and information centre on St Mary's Quay; and probably also in the TIC and most landing places around the islands. One of these (*Report that fish*) had information about the study and requested participation, and the other (*What's that Fish?*) offered help with identification and said where to send records of unusual marine life.
- Information about the survey requesting reports and comments was posted on the *Glaucus - Marine Wildlife of the NE Atlantic*; *CornishWildlife*; and the *World Sea Fishing* e-forums.
- An illustrated talk for a general audience *Treasure beneath the waves - Fishes of the Isles of Scilly*, was prepared and delivered.
- Four or more interviews were recorded or broadcast live on Radio Scilly.
- Three articles were published in *Scilly – Now and then*.
- Around 500 words in the *Western Morning News*.
- Full page spread with photos in *Fishing News*.
- Article submitted to, but apparently not used in, *Sea Angler*.
- Paper on Pearlsides published in *Isles of Scilly Birds and Natural History Review 2008* (joint with Ren Hathway).
- Joint papers on Slipper Lobsters *Scyllarus arctus*; and another on Jumbo shrimps *Marsupenaeus japonicus*; these include all data to date from the Isles of Scilly, in press for publication in the *Irish Naturalists' Journal*.

2.3) Recording Scheme

Because the amount of information a single observer on shore can collect is very limited, even with a few trips to sea, it was essential to involve those people who knew the seas intimately. Hence a scheme was set up in the hope of getting fishermen, anglers and divers to record the fish they came across and report these to the Isles of Scilly Wildlife Trust. This consisted of a pack of materials to aid the identification and recording of fish and a few selected invertebrates at sea. The identification sheets were laminated and the pack contained in a plastic wallet to protect it from sea spray and moisture.

Each pack consisted of

- An introductory letter
- 5 Fish Sighting Sheets
- 5 Fish Report Forms
- Isles of Scilly Fish Identification Sheet – 5 laminated sheets
- Shark Trust guide to British Skates and Rays
- Shark Trust guide to British Sharks
- A plastic wallet or folder

The identification guide and recording sheets were also made available online at the Isles of Scilly Wildlife Trust's website http://www.ios-wildlifetrust.org.uk/livingseas/Fish_and_fishing_study.

Twenty five packs were produced and 22 distributed to people who said they were willing to participate, but unfortunately only three returned completed forms. There was a general ready acceptance and goodwill towards the project but this did not convert to actual participation. Those forms returned were very useful.

2.4) Study of the fishing fleet

The Maritime Officer was very helpful and provided some details of the vessels and facilities in the islands along with the relevant regulations and a list of mainland vessels holding "historic rights" to fish in the waters around Scilly.

Further details of the vessels registered in Scilly and of other fishing vessels working outside the six-mile limit were obtained by conversations with fishermen, direct observation, and from the Defra (MMO) website. Those fishing vessels seen moored, fishing, or transferring their catches around the islands were recorded, so that it was known which of the registered vessels were active in the fisheries. Where possible a note was also made of their gears and associated equipment.

A recording form was prepared and used to register the fish landed from those boats operating around the islands.

Unfortunately, it was only possible to get to sea once, and that on a non-commercial boat working a few pots and fishing with rod and line.

2.5) Study of shore fish

The intertidal boulder beaches are a BAP habitat and so when possible a search was carried out and records made of fish on these shores. Fish were recorded from rockpool rambles, but especially during the Porcupine Marine Natural History Society field meeting. This latter study included a number of boulder shores by hand searching and the use of baited bottle traps in rockpools, and also some intertidal sandflats by hand and push net. An effort was made to train Isles of Scilly Wildlife Trust staff and volunteers in fish identification and some study methods. Further data was forthcoming from the Isles of Scilly Wildlife Trust Shoresearch surveys, and a study of rockpool fish undertaken by a student volunteer.

2.6) Review of literature and records

A search was carried out through contacts, on the Internet, and principally through the resources of the National Marine Biological Library (Plymouth) for published material on the fish and fisheries of the islands and a bibliography has been compiled. Records of the occurrence and distribution of fish from the area were also collected from the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS), the United Kingdom Marine Fish Recording Scheme (UKMFRS), Centre for Environment, Fisheries and Aquaculture Science Trawl Surveys and the records of Seasearch surveys.

3) Overview

The Isles of Scilly lie around 28 miles west of the Cornish mainland in the Western Approaches and consist of over 30 small islands, of which five are inhabited. The resident population of around 2000 is greatly increased from April to October by visitors. The majority of these will partake of activities in the marine environment, - boating, angling, diving or simply enjoying the shore, often rockpooling or exploring the strandline. It is this maritime experience that makes the Isles of Scilly such a special place.

The shores and clear water of the sea area around the islands create a suitable environment for a variety of fish. The distance from the mainland and currents sweeping through the islands maintain a relatively low level of pollution in the region. The isolation from the Cornish coast and differences in environmental conditions

produce a fish community which is different from most mainland areas. Several southern (Lusitanian) species occur because of the archipelago's geographical position, and yet the cooler the waters around Scilly also form the southern limit of some boreal (northern) fish. Further the more open aspect means that oceanic animals are more frequent here. The first British record of a Blue Marlin (*Makaira nigricans*) is of remains of a specimen found on a beach on St Agnes in the early spring of 1982.

The islands lie within International Council for the Exploration of the Sea (ICES) Fishing Area VIIe (and just south of VIIf). VIIf and the British sector of VIIe are administered by the Marine Management Organisation (MMO) of the Department of Environment, Food and Rural Affairs. However, the inshore waters (out to 6 nautical miles), are regulated and controlled by the Isles of Scilly Sea Fisheries Committee, which on 1st April 2011 will become the Isles of Scilly Inshore Fisheries and Conservation Authority (IFCA). Salmonid fish come under the jurisdiction of the Environment Agency (EA). There are about 20 active registered fishing vessels forming the small resident fishing fleet. Most of these are potters and netters. There are also a number of unlicensed non-commercial "hobby" fishermen, mainly working a few pots and handlines.

The Fish and Fishing Study of the Isles of Scilly Marine Biodiversity Project set out to gather an overview of the abundance, distribution and ecology of the fish of the area. The specific remit of the study covered the fish associated with Biodiversity Action Plan (BAP) Habitats (seagrass beds; fragile sponge and coral communities on rocky reefs; intertidal boulder communities, tide swept channels; and sands and gravels) and BAP Species of fish within the Isles of Scilly Complex Special Area of Conservation (SAC). The priority species of marine fish which have, or are likely to, occur in this area include sturgeon, shads, eels, a sandeel, salmon, sea trout, seahorses, basking sharks, blue sharks, angel shark, a number of deepwater sharks, skate and, through the grouped species action plans, a number of species of commercial and deepwater fish. Crawfish are similarly a BAP species.

The SAC covers the islands and surrounding waters, extending approximately from 49° 51' to 50° 00' N and 006° 14' to 006° 28' W, but this study is taking in the wider area around the islands, basically the sector of British waters west and south of the Seven Stones reef (and lightship).

4) Areas and habitats

These are generalised fishing areas or specific habitats.

4.1) Intertidal

4.1.1) Boulder shores

These were present on most islands and were studied at sites on St Mary's, St Agnes and St Martin's. These shores are very varied some relatively flat and weed covered, while others were steep with little vegetation on the exposed boulders. On one the boulders were piled on top of others to such an extent as to make it difficult to access the bedrock. Most had rockpools, generally the larger ones being on the upper shore.

4.1.2) Intertidal sandflats

These consisted of shallow banks and channels; and were examined on Tresco and St Martin's. Most are devoid of algae but where any hard substrate occurs there can be a profusion of *Fucus* and other weed providing shelter for a number of animals more usually found on rocky shores.

4.2) Inshore

4.2.1) Eastern sector – from Tresco and St Mary's east to the Seven Stone reefs, including the areas around St. Martin's and the Eastern Isles. The bottom can be rocky but is generally hard (stony or shale) and mixed with areas of sand east of the Eastern Isles. Depths range from 20 down to 75 metres.

4.2.2) North – from the Eastern Isles round to the north of St Martin's, Round Island and Tresco, out to six miles, in depths of 20 to 77 metres. The ground is mostly hard but suitable for trawling. There are rocky reefs to the north of St Martin's. The hard ground further north is a preferred area for crawfish.

4.2.3) North west – Bryher round to Steeple Rock. Mainly sandy ground in depths of 50 to 70 metres, but going down to 85 metres in places.

4.2.4) West – south of St Agnes out to the Western Rocks, Bishop Rock (The Bishop), Broad Sound and north to the Crim Rocks and Nundeeps. This area consists

of rock and weed in the shallower parts where wrasse are common, rock, stony ground, rock and sand, and patches of sand. Much of this area is less than 50 metres deep, but to the south it goes down to 78 metres.

4.2.5) Mud patch – About 12 miles off the Bishop in about 100 to 120 metres is a deep area of mud formerly fished by Newlyn fishing vessels using longlines and nets for skates and rays.

4.2.6) Poll Bank – three miles south west of the Bishop Rock. This bank of rocky ground rises steeply from approaching ninety metres to within twenty five metres of the surface. It is the habitat of many rock-dwelling fish including ling and conger; and also produces upwellings with a consequent richness of plankton and plankton feeders.

4.2.7) South – from Menawethan, south of St Mary's and St Agnes to the Bishop. This is largely sand; but there is a ridge known as "the Banks" which provides good angling in depths of 60 to 67 metres.

4.2.8) Crow Sound – between the Eastern Isles and St Mary's has areas of mud and clay which can make trawling difficult. When combined with weed they can clog and fill the net.

4.2.9) The Flats – much of the shallow area (0 to 10 metres) between St Mary's, St Martin's and Tresco consists of *Zostera* beds and sandflats.

4.2.10) Tide-swept Channels - passages between rocks and islands where the tidal flow is constricted producing a powerful current. These are a [BAP habitat](#) and are found in Tean Sound, Tresco Channel, around English Island, Smith Sound and between some of the Western Rocks.

4.3) Offshore

The waters of the British sector of the Western Approaches stretch out over the continental shelf at depths of 50 to 200 metres, though at the south western extreme they reach the continental slope and plunge down to more than 2000 metres.

Beyond the six mile limit these waters can be fished by larger fishing vessels and any vessel with quota from the European Union to fish in ICES areas VIIe, VIIh, or VIIg.

4.3.1) North and north west – out towards the Labadie Bank with areas of mud and ooze.

4.3.2) South and south west – west from Scilly to the Jones Bank, south towards Parsons Bank and south west to the Little Sole Bank. This area is widely fished by beam trawlers.

5) Fisheries and Fishing methods

Around 54 fishing vessels are currently registered as based in the Isles of Scilly, but less than half appear to be actively fishing on a regular basis. At the start of this study there were two trawlers operating out of St Mary's but by November 2010 both had been sold away. Most of the other boats are multi-purpose, but mainly pot for crustaceans. The majority are also suitable for netting, and nearly all carry handlines or rods for additional fishing.

Since 1970 there has been a prohibition on vessels over 11 metres and over 10 tonnes fishing within 3 miles of the islands, except when using longlines or handlines. In 1994 this was extended to 6 miles with an exemption for those boats with "Historic rights" (those having a long term proven history of fishing in the area).

Eighteen vessels have "Historic rights" to fish from 3 to 6 miles from the shoreline, but some are no longer registered, and again less than half do so.

At least fifteen British vessels and an unknown number of foreign boats are regularly fishing outside of the six-mile limit, to the limit of British waters and beyond.

There are several accounts of the fishing in Scilly in the nineteenth century including North (1850), Smart (1886) and most detailed by Woodley (1822). The modern fishing industry largely developed with the innovations of the twentieth century. Gray (1995), Robson (1996a) and Pawson *et al.* (2002) give accounts of some of the changes in the local fishing fleet in the last twenty years.

5.1) Trawling

5.1.1) Otter trawling

A conical net with a weighted footrope and buoyed headline is towed along the bottom, being kept open by the pressure of the water on two offset otter boards or doors. The local trawlers used relatively small nets with rubber discs on the footrope to bounce over small obstructions and small rectangular metal doors. The height opening of the net was 1.5 to 2 metres; and in a normal day the boat would do three three-hour tows, but two five-hour ones on cleaner ground. This set-up would be mainly targeted at flatfish but will catch round fish as well.

5.1.2) Beam trawling

This is similar to otter trawling but the gear is heavier with a chain footrope and lower mesh, and held open by a strong metal beam. These need more powerful vessels due to the weight of the gear and the way it drags through the sea bed; the boats operate beam trawls in pairs with one each side for stability. The nets have a low opening, usually less than one metre and are aimed at sole and other flatfish. No beam trawlers operate in the islands, but they are the mainstay of the south west of England fishing fleets and many fish the surrounding waters.

5.2) Scallop dredging

The gear consists of a beam on each side of the vessel, but instead of a single net each beam has attached to it a number of toothed metal dredges each about 60 centimetres wide with their netting consisting of iron rings. These can be operated by a variety of vessels from beam trawlers to small inshore boats, the number of dredges per side can vary from two to twenty-four. In order to protect sensitive habitats within the SAC, the Isles of Scilly SFC passed a byelaw in 2002 restricting vessels to no more than two dredges per side within 4 miles of the islands. Effectively this means that there is no dredging for scallops within this area.

5.3) Netting

Most set nets consist of a lightly buoyed headline, from which a barely-visible nylon monofilament net hangs down to a weighted footrope. The maximum vertical distance between the knots of the net, when under tension, is the mesh size and this varies

according to the animals targeted. Light ropes from the head rope to the footrope determine how loose or tight the mesh hangs. These nets either work by catching the fish by the operculum or gill cover, or being loose so that they become entangled. A line of nets will usually be set with a rope up to a marker buoy at the surface at the end of a section of nets.

5.3.1) Pollack nets.

These are general nets set fairly upright with a light footrope on or close to the sea bed, around rocks and wrecks. They capture fish by their opercula. The mesh makes them size selective, catching most round fish of an appropriate size, especially Pollack (*Pollachius pollachius*). Similar nets are used to catch Red Mullet (*Mullus surmuletus*)

5.3.2.) Ray or tangle nets.

These nets are similar to pollack nets but hung more loosely and with a heavier footrope to hold them on the bottom. They mainly catch rays, Anglerfish (*Lophius piscatorius*), and Turbot (*Psetta maxima*); they will also take a variety of other bottom fish as well as crabs and crawfish.

5.3.3) Trammel nets.

These consist of three layers of netting, a large mesh one on each side and a smaller mesh one between. A fish passing through the outer net is held by the middle net and passes through the further large mesh net and is held in a pouch of netting. They may be used for catching fish to use as bait in the pots or in a similar way to tangle nets.

5.3.4) Mullet nets.

Grey mullet may be caught in pollack nets, but they may also be specifically targeted. This can be done in bays using a small boat or skiff. A net 2 fathom (3.6 m) deep and 20 fathoms long (36 m) is paid out over about 20 minutes, it is then left about 5 minutes, before being hauled in over the next 40 minutes; so the total soak time is around one hour.

5.4) Potting

Traps or pots are the most widely used fishing method in the islands. It is estimated that between 3500 and 5000 traps are in use during the season. Commercial boats may fish 150 to over 800, lifting them every couple of days, while non-commercial fishermen can be working up to 30 pots. Most boats set around 300 pots and haul 150 each day, giving a normal soak time of two days.

There are several varieties of traps all consisting of a metal frame covered with plastic netting, often bound together with rubber strips. These are baited with fish or other carrion and usually weighted so that they rest on the sea bed and are not moved by waves or currents. Traps are increasingly having escape panels fitted. These are rectangular plastic panels with a hole too small for a marketable crab to escape but large enough to allow undersized animals out. It is not known how widely these have been adopted in Scilly. There are three main types of trap used in the islands.

5.4.1) Inkwell pots.

These are based on the traditional wicker lobster pots; with a metal mesh base and a frame giving it a typical beehive shape with a single entrance at the top. This entrance is an inward-curving sleeve of rubber or plastic, commonly six inches wide.

5.4.2) Parlour pots.

These are more like a creel in form, with a flat base and a D-shape frame. They have two compartments with a similar entrance to an inkwell in the top of one and the bait in the other. An animal entering through the top then has to push through a soft tapering netting sleeve into the "parlour" to reach the bait. Having done so, it would then have to push out the "wrong way" through the small entrance and then up and out of the top opening to get free. These are lighter and have a better catch rate than the inkwells and have largely replaced them. However, few creatures escape from these traps, and if they cannot be attended for a while due to bad weather or are lost most of the catch will die and rot in the trap.

5.4.3) Soft-eye pots.

These are similar in shape to parlour pots but consist of a single compartment with two side entrances. These are both tapered netting sleeves, offset, one on each side of the trap.

All types of pot catch both crab and lobster; the Edible or Brown Crab (*Cancer pagurus*) is the main catch, but Velvet Crabs (*Necora puber*) and Atlantic Lobsters (*Homarus gammarus*) are also taken. Lobsters are more frequent further offshore, on hard bottom and in tide-swept channels.

Most fishermen work more than one type of pot; one uses a heavier inkwell pot at either end of a string of pots with lighter soft-eyes in between.

5.5) Bait.

The islands' fisheries are so dependent on trapping that the availability of bait for the pots is of major importance. Most mainland pot fisheries primarily use unsaleable bycatch from other fisheries especially trawlers. This bycatch was used in St Mary's, but was limited due to the small amount of trawling. Next season the only bait from this source will be that which can be bought from visiting trawlers.

Some local boats use set nets, trammel nets, and mullet nets to catch fish, especially wrasse and mullet, to be used as bait.

However, the majority of vessels have to buy fish from Newlyn to use as trap bait. This is mainly bycatch in the form of gurnards and Horse Mackerel (*Trachurus trachurus*), but can also be mackerel (*Scomber scombrus*). The fishermen also purchase the "frames" of mackerel and bass from fish processors. These "frames" are the heads and skeletons left after the fish has been filleted.

5.6) Shrimping

The local "shrimping" season is from July to September, and takes place during low water spring tides. Shrimping in the islands is carried out in shallow water with a push net and is targeted at prawns (family Palaemonidae). True Brown Shrimps *Crangon crangon* do get caught and sometimes eaten, but most are discarded, and some people were not even aware that they were edible.

5.7) Mariculture

There was no evidence of aquaculture at present on the islands. Robson (1996b) states “The cultivation of Pacific oysters used to occur on St. Mary’s Island and between Bryher and Tresco. However, mariculture is not currently regarded as a viable proposition in the Isles of Scilly, owing to the impact of severe weather conditions due to the lack of suitably sheltered sites (Atlantic Consultants 1995; Council of the Isles of Scilly 1995).”

5.8) Angling

Sports fishing, in the form of recreational sea angling, is a popular pastime in the islands, but also brings over numbers of tourists. Other tourists who are not normally anglers may be tempted by the evening fishing trips, to try it for the first time. Angling takes place from the coastal rocks and from local boats. “The Isles of Scilly yield big catches of cod, ling, conger and pollack, but bass are rare.” (Robson, 1996a)

5.8.1) Shore angling.

The rocks of the outer shores of the islands frequently lead to relatively deep water where *P. pollachius* can be caught and areas with greater algal cover are inhabited by Ballan Wrasse (*Labrus bergylta*) and Cuckoo Wrasse (*Labrus mixtus*). Sandy flats are fished for more mixed fish including flatfish and dogfish, while large grey mullet are sought in suitable areas around the islands.

5.8.2) Boat angling.

Some trips fish around the islands for Pollack and Mackerel, while others head for reefs where a more mixed catch including Cod (*Gadus morhua*) and Conger eels (*Conger conger*) are more likely. Longer excursions take anglers out to the Bishop Rock and Poll Bank where larger Pollack, Cod, Conger and Ling (*Molva molva*) may be caught.

During the period July to September the area from 5 to 8 miles south of St Mary’s can yield catches of Blue Sharks (*Prionace glauca*), which are tagged and released as part of the UK Shark Tagging programme (www.ukshark.co.uk) run by Dr. Ken Collins of the National Oceanographic Centre at Southampton University (Whittaker, 2001). Porbeagle sharks (*Lamna nasus*) are occasionally caught and Basking Sharks

(*Cetorhinus maximus*) frequently seen. Porbeagles can be found throughout the year, and the larger ones are thought to appear around the islands in the winter when few people are out fishing for them.

5.9) Spearfishing

Since the non-statutory Marine Park was set up any spearfishing within the Isles of Scilly SAC has been actively discouraged. There is no evidence that it does occur in the area.

6) Fish processing and supply to the islands

There is a chill store and ice-making plant on Rat Island along St Mary's Quay, but few other fish handling facilities. Apart from the preparation of crab there is no fish processing in the islands. Locally-caught crab is available on the islands but most goes to merchants and processors in Hayle and Newlyn. In the mid 1990s most of this was exported to France and Spain.

The two trawlers supplied fish direct to associated outlets on St Mary's with surplus going on the ferries to Newlyn. Other vessels fishing around the area, if not returning to the mainland, will also trans-ship fish and shellfish via the Scillonian III or the Gry Maritha.

Locally-sourced white fish is scarce and could be found at Adam's Fish and Chips on St Martin's; The Galley, fresh fish, chip shop and restaurant, on St Mary's; and, in 2009, from the Fish Stall, Porth Mellon, St Mary's. Griffins butchers and fishmonger obtain their supplies from Newlyn Fisheries, Newlyn and it is most likely that The Co-op also uses a mainland supplier.

Restaurants and pubs give the impression that they use local fish, but since many menus include sea bass, and sometimes sea bream, both of which are very rare in local catches this is unlikely.

7) Research Surveys

The Centre for Environment, Fisheries and Aquaculture Science (CEFAS), and its predecessors, have carried out groundfish surveys for a number of years in an area to the south of the islands around 49° 30'N and 006° 30'W in depths of around 110

metres. There were five trawls in 2003 and 2004 for the Western Channel survey using two 4 metre beam trawls; and 31 between 1982 and 2007 as part of the Celtic Sea survey using a variety of bottom trawls including the standardised GOV high opening trawl. In recent years these surveys have been undertaken on the R.V. CEFAS Endeavour.

8) Communities

8.1) Boulder coasts

The granite of the islands weathers into large boulders.

8.1.1) Intertidal. (BAP habitat)

Boulder beaches make up much of the islands coastline, on exposed and more sheltered coasts. The boulders vary considerably in size. Most rockpools are found on the upper shore, being largely replaced on the lower shore by gullies. Lower shore boulder beaches are a BAP habitat.

A variety of fish are found below these boulders or under weed on the more sheltered ones. The commonest is the Shanny (*Lipophrys pholis*), other common species are the Long-spined Sea Scorpion (*Taurulus bulbalis*), the Worm Pipefish (*Nerophis lumbriciformis*) and Butterfish (*Pholis gunnellus*); the Shore Rockling (*Gaidropsarus mediterraneus*) and Five-bearded Rockling (*Ciliata mustela*) are regular on more sheltered shores. Interestingly a Three-bearded Rockling (*Gaidropsarus vulgaris*) was found on the lower shore at Appletree Bay on Tresco, this is normally a sublittoral species but Harvey (1969) and others have commented on the occurrence of otherwise subtidal species on the lower shore on Scilly. Other fish of this community include the European Eel (*Anguilla anguilla*), Corkwing Wrasse (*Crenilabrus melops*), 2-spotted Goby (*Gobiusculus flavescens*), Shore Clingfish (*Lepadogaster purpurea*), Connemara Clingfish (*Lepadogaster candolii*) (only recorded from St Martin's), Small-headed Clingfish (*Apletodon dentatus*), and Two-spotted Clingfish (*Diplecogaster bimaculata*), with the occasional 15-spined Stickleback (*Spinachia spinachia*), Greater Pipefish (*Syngnathus acus*) and Montagu's Sea Snail (*Liparis montagui*) (Parslow, 2000).

The upper shore rock pools are the habitat of *L. pholis*, Rock Gobies (*Gobius paganellus*), Montagu's Blennies (*Coryphoblennius galerita*) and juvenile grey mullet.

The Giant Goby (*Gobius cobitis*) has also been recorded from these pools (Potts and Swaby, 1992; Wheeler, 1993; Parslow, 2000), and a number of large gobies (ca 14 cm in length) were found here but rock gobies can also reach this size. It was found virtually impossible to distinguish these gobies from *G. paganellus* in hand or from photographs; these two species can be separated by a lateral line scale count and microscopic examination of the pores of the head.

8.1.2) Subtidal.

Underwater the boulders are generally covered in algae or sessile invertebrates. In these areas the most abundant fish are Ballan Wrasse (*Labrus bergylta*), Cuckoo Wrasse (*Labrus mixtus*), Goldsinny (*Ctenolabrus rupestris*), *G. flavescens*, and Leopard-spotted Gobies (*Thorogobius ephippiatus*); others include Lesser Spotted Dogfish (*Scyliorhinus canicula*), Pollack (*Pollachius pollachius*), Bib (*Trisopterus luscus*), Poor Cod (*Trisopterus minutus*), *T. bulbalis*, *C. melops*, Rock Cook (*Centrolabrus exoletus*), dragonets (*Callionymus* sp.), Topknot (*Zeugopterus punctatus*), Norwegian Topknot (*Phrynorhombus norvegicus*), sandeels (*Ammodytes* sp. or *Hyperoplus* sp.), Boarfish (*Capros aper*); and infrequent *S. acus*, Saithe (*Pollachius virens*), and Nursehound (*Scyliorhinus stellaris*).

8.2) Rocky coasts

8.2.1) Coastal

The shallower areas are home to *C. melops*, *C. rupestris*, *G. flavescens*; while the kelp forests harbour *L. bergylta*, *L. mixtus* and *P. pollachius*. Tompot blennies (*Parablennius gattorugine*) and *Z. punctatus* can be found in holes and niches. The recently discovered Red Blenny (*Parablennius ruber*) lives in crevices in more exposed areas with greater water movement (Goodwin and Picton, 2007). A variety of fish including *G. morhua*, *T. luscus*, *T. minutus*, Whiting (*Merlangius merlangus*), *S. scombrus* (Lewis *et al.*, 2008) and *T. trachurus* utilize the area around the rocks; and less frequently Lump sucker (*Cyclopterus lumpus*) and Comber (*Serranus cabrilla*) may be found here.

8.2.2) Fragile sponge and coral communities on subtidal rock. (BAP habitat)

This is a BAP habitat and while the sessile invertebrates form a distinctive assemblage the fish are generally similar to those found in boulder areas with *L. bergylta*, *L. mixtus*,

C. rupestris, and *S. canicula* commonest, and *G. flavescens*, *C. exoletus*, *C. melops*, *T. minutus*, *T. ehippiatus*, *T. bulbalis*, *P. norvegicus* and *Z. punctatus* also occurring.

8.2.3) Offshore rocky reefs.

These are in deeper water are characterised by larger caves and refuges and are consequently favoured by larger *C. conger*, *M. molva*, *G. morhua* and *P. pollachius*. In the nineteenth century very large Skate (*Dipturus batis* complex) and *L. piscatorius* were caught at, or more probably around, Poll Bank (Smart, 1886).

8.3) Tide-swept channels. (BAP habitat)

These channels with strong tidal flows are favoured by *H. gammarus*. Their fish community is similar to the general rock community with elements of the sand fauna on the clean sand bottoms. It includes *L. bergylta*, *T. bulbalis*, *P. pollachius*, *T. minutus*, *G. flavescens*, *S. spinachia*, *Callionymus* sp., gobies (*Pomatoschistus* sp.), Painted Goby (*Pomatoschistus pictus*) and *D. bimaculata*. *L. mixtus*, *C. melops*, *C. exoletus*, *C. rupestris*, *G. paganellus* and *T. ehippiatus* may be found at the margins of the channels.

8.4). Stone and sand

This is one of the commonest substrates around the islands and generally lies in depths of 5 to 40 metres. It is the main habitat of the European Spiny Lobster, Crawfish or Crayfish (*Palinurus elephas*). Curled or Lesser Octopuses (*Eledone cirrhosa*), which mainly prey on crabs and prawns, are also caught here. (These would probably be found more commonly in other areas, if suitable methods for collecting were used.) The larger fish of the area are Thornback ray (*Raja clavata*), *P. maxima*, Brill (*Scophthalmus rhombus*), *L. piscatorius*, *C. conger*, *S. stellaris*, *S. canicula*, *P. pollachius* and *G. morhua*. The smaller fish in the community are sandeels, Lemon Sole (*Microstomus kitt*), *G. vulgaris*, *T. luscus*, Tadpole fish (*Raniceps raninus*), small *M. molva*, *M. surmuletus*, Red Gurnard (*Aspitrigla cuculus*), Grey Gurnard (*Eutrigla gurnardus*) and *T. bulbalis*. Less frequently found are Cuckoo Ray (*Leucoraja naevus*) and *P. virens*.

8.5) Sand

8.5.1) Intertidal sandflats.

The shallow sandbanks and channels are only exposed at low water on extreme spring tides and are a rich habitat. “O” group (2 cm young of the year) Plaice (*Pleuronectes platessa*) are very common with a few year 1 fish. The Lancelet (*Branchiostoma lanceolatum*) and Lesser Sandeel (*Ammodytes tobianus*) are common, lying buried in the sand at low water, while *Callionymus* sp. and *Pomatoschistus* sp. may also be found.

The channels through the sandflats have a population of abundant *Pomatoschistus* sp., *G. flavescens*, *S. spinachia*, juvenile grey mullet and a few *A. anguilla*.

The occasional rock or other patch of hard substrate (often man-made) is rapidly colonised by algae and the subsequent cover is used by a variety of fish including *G. flavescens*, *T. bulbalis*, *N. lumbriciformis*, *S. spinachia* and *C. melops*.

8.5.2) Sandy Bays

Sheltered sandy bays are a limited but interesting habitat. Both Thick-lipped Grey Mullet (*Chelon labrosus*) and Golden Grey Mullet (*Liza aurata*) are thought to spawn in suitable bays. Other fish regularly seen are *L. bergylta*, *P. pollachius*, *P. platessa*, sandeels (*Ammodytes* sp.), Common Dragonet (*Callionymus lyra*), Common Goby (*Pomatoschistus microps*) and Sand Goby (*Pomatoschistus minutus*) (De. Thompson and K. Legg, *pers. comm.* 2009, Parslow, 2000)

8.5.3) Subtidal Sands (BAP habitat)

Subtidal sands are probably the most widespread habitat around the Isles of Scilly and the main area for bottom trawling.

Some shallow inshore areas teem with large shoals of Sand Smelt (*Atherina boyeri*). The surrounding waters are the principle habitat for the majority of the flatfish; *P. platessa*, Megrim (*Lepidorhombus whiffiagonis*), Common Sole (*Solea solea*), and *S. rhombus*, as well as smaller numbers of *P. maxima*, and Sand Sole (*Pegusa lascaris*) (D. Thompson, *pers. comm.*, 2010). *M. kitt* is reasonably common but usually patchy in its distribution. The dominant rays are *R. clavata* and *L. naevus*, Blonde Rays (*Raja*

brachyura) are scarce and Common Stingrays (*Dasyatis pastinaca*) are rare. Much of the catches are of Haddock (*Melanogrammus aeglefinus*), *M. merlangus*, *G. morhua*, and medium to small *L. piscatorius*; with *M. surmuletus*, Tub Gurnard (*Chelidonichthys lucernus*), *E. gurnardus*, Hake (*Merluccius merluccius*), and John Dory (*Zeus faber*). Varying amounts of the small red Boarfish (*Capros aper*) are to be found here.

“The Banks” sandbank to the south of St Mary’s is an area that attracts anglers in the summer months for *M. merlangus*, *G. morhua*, *M. surmuletus*, *A. cuculus* as well as the *S. scombrus* and *T. trachurus* that can be caught over the bank (D. Townend, *pers. comm.*, 2010).

8.6) Seagrass beds (BAP habitat)

The extensive beds of eel grass *Zostera marina* are a major feature of the Isles of Scilly complex SAC. The fish community within these beds is similar to that of the sandflats and the fish recorded from the Isles of Scilly *Zostera* beds are *P. pollachius*, *L. bergylta*, *C. melops*, *T. bulbalis*, *C. lyra*, *G. flavescens* and *P. microps* (ERCCIS, 2010 and Parslow, 2000). The *Zostera* beds were much more extensive, dense and luxuriant before the global outbreak of wasting disease in the 1930s and at that time it is said that large *C. conger* lived in tunnels under the rhizome masses (S. Walder, *pers. comm.*, 2009).

It has been widely assumed that seagrass beds form the principal habitat of seahorses *Hippocampus* spp. but recent work (Garrick-Maidment, 2007) has shown that whilst this is a major habitat, both British species can be found in a wider variety of biotopes. ERCCIS only holds two records of *Hippocampus* in Scilly and neither of these gives the habitat, however the location of one of a Short-snouted Seahorse *Hippocampus hippocampus* from 1982 is “probably Tresco” and could be from an area of *Zostera*.

8.7) Subtidal Mud

While there are patches of mud in Crow Sound (D. Thompson, *pers. comm.*, 2010) nothing is known about their fauna. An area about 12 nautical miles west of the Bishop Rock is a more significant mud habitat. Before the 2008 amendment to the Wildlife and Countryside Act of 1981 (WCA) and the subsequent fisheries regulations that prohibited the landing of skates and certain rays, this area was fished with longlines and nets for *D. batis* and large *Raja* spp., including *R. clavata*.

8.8) Offshore grounds

The grounds to the south, west and north west of the Isles of Scilly (ICES areas VIIh, VIIg and parts of VIIj) from 50 metres down to about 200 metres, are a major fishing area for the beam trawlers of south west England but also for vessels from all parts of the United Kingdom and the Republic of Ireland, as well as a large fleet of foreign vessels holding quota from the European Union. The main target species are *S. solea* and *M. merluccius*; the first caught mainly in beam trawls; the latter primarily by with bottom set nets.

The benthic fish community is rich in flatfish; the commonest of which are Thickback Sole (*Microchirus variegatus*), *L. whiffiagonis*, Imperial Scaldfish (*Arnoglossus imperialis*), and Scaldfish (*Arnoglossus laterna*), followed by *S. solea*. Witch (*Glyptocephalus cynoglossus*) and Dabs (*Limanda limanda*) are also found here. Data from the CEFAS Trawl surveys (1982 to 2007) and UKMFRS show that of the other bony fish *T. minutus* is the commonest along with Blue Whiting (*Micromesistius poutassou*), *C. lyra*, Spotted Dragonet (*Callionymus maculatus*); other relatively common fish of the area are Norway Pout (*Trisopterus esmarkii*), *M. aeglefinus*, *M. merluccius*, *M. merlangus*, *L. piscatorius*, the gurnards *Chelidonichthys lucernus*, *Eutrigla gurnardus* and *Aspitrigla cuculus*; other fish found in this sector include *G. morhua*, *Z. faber* and the Black-bellied Angler (*Lophius budegassa*).

The only elasmobranch that is commonly found in samples is *S. canicula*, but the Spurdog (*Squalus acanthias*) and smooth hounds (*Mustelus* spp.) are also caught. Shagreen Rays (*Leucoraja fullonica*), Spotted Rays (*Raja montagui*) and *L. naevus* occur, and the Sandy Ray (*Leucoraja circularis*), *R. clavata* and Undulate Ray (*Raja undulata*) are relatively rare.

Quite a variety of rarer fish have been found in these deeper areas reaching out to oceanic waters have over the years. These include the only specimen of an Imperial Blackfish (*Schedophilus ovalis*) found in UK waters. Two deepwater Sharpnose Sevengill Shark (*Heptanchias perlo*), and several Bluntnose Sixgill Shark (*Hexanchus griseus*), which can grow to over five metres, have been caught here. Other uncommon or seldom seen fish that have been caught in this area are Moray Eel (*Muraena helena*), Sailfin Dory (*Zenopsis conchifer*), Wreckfish (*Polyprion americanus*), Remora (*Remora remora*), Yarrell's Blenny (*Chirolophis ascanii*), Blackfish (*Centrolophus niger*) and Four-spot Megrim (*Lepidorhombus bosci*).

Shoals of the anadromous clupeid the Allis Shad (*Alosa alosa*) have been caught in the waters to the west of Scilly by vessels netting for *M. merluccius*.

8.9) Open water

The primary food source in open water is plankton, hence all fish in this habitat feed on various types plankton, or the planktivorous fish and other predators that feed on it. Most are small pelagic fish such as *S. scombrus*, *T. trachurus*, Herring (*Clupea harengus*), Pilchard (*Sardina pilchardus*) or Sprat (*Sprattus sprattus*), or even the occasional Atlantic Chub Mackerel (*Scomber colias*). Although only one single fish was found by the CEFAS surveys, it is highly probable that shoals the small mesopelagic Pearlside (*Maurolicus muelleri*) occur in the mid and upper waters and are fed upon by *S. scombrus* in the early months of the year (Tait and Dipper, 1998).

The pelagic shoals are the prey of cetaceans and seabirds, as well as Garfish (*Belone belone*) and pelagic sharks. They would also be preyed upon by billfish and tunas, but there is no evidence of these regularly feeding in this area though they probably did in the past. Blue Sharks (*Prionace glauca*) are present, especially to the south and west of St Mary's, from July to September. Small Porbeagles (*Lamna nasus*) have been caught in August and early September, but it is probable that, as in other parts of the south west, larger individuals are present in the winter months (De Thompson, *pers. comm.*, 2009).

The large planktivorous fish of these waters are the Basking Shark (*Cetorhinus maximus*) and Ocean Sunfish (*Mola mola*); and the jellyfish hunting Leathery Turtle (*Dermochelys coriacea*) may also be seen.

8.10) Mooring and pot ropes

Buoyed ropes which are in the water most of the time, such as mooring ropes and some pot ropes quickly develop a coating of algae and sessile invertebrates. Small fish find this cover attractive and numbers of *N. lumbriciformis*, small *R. raninus*, and, in autumn, the spiky young of *C. lumpus* (Fig.1) may be found here (K. Legg and K. Lowe, *pers. comm.*, 2010)



Fig.1 Juvenile Lumpsucker *Cyclopterus lumpus* (ca 3 cm).

© Douglas Herdson, 2007

9) Species and Group accounts.

9.1) European Spiny Lobster *Palinurus elephas*. (BAP species)

The spiny lobster, which is more generally known as Crayfish or Crawfish, is a BAP Species. Unlike *H. gammarus*, *P. elephas* is a migratory species of the more open firm bottom areas. It is less common and more offshore than *H. gammarus* (Pawson and Robson, 1996a)

They may be trapped in baited pots, but are normally caught by bottom set trammel or tangle nets. This was a major fishery of the islands but has now declined considerably, though several boats do still set nets for them, over rocky ground in August and September.

After the Second World War they were abundant, with up to 170 being caught in one mile of net, and some boats fishing 30 miles of net. By the late 1950s they were still common with 80 *P. elephas* being taken from 60 pots: it is now unusual to find one in a pot.

Further evidence of the decline of this species as a result of fishing pressure is shown in the decrease in male carapace length of animals landed in Cornwall from around 160 mm in the 1960s to 120 mm in the early 1990s. It is suggested that this species would benefit from no take zones (UK BAP, 2009).

During the 2009 and 2010 the fishermen considered the catch of *P. elephas* to be average for these days, that for 2010 down a bit on 2009. However, they were finding significant numbers of young undersized crawfish which were returned (I. Mitchell and K. Legg *pers. comm.*, 2010). This shows that the stocks could have the potential for recovery, particularly if suitable no take zones can be agreed and instituted.

9.2) Slipper Lobster *Scyllarus arctus*

This small clawless lobster is a southern (Lusitanian and Mediterranean) species, from 9 to 14 cm in length and living among rocks, at depths of 12 to 145 metres most occurring around 50 m. In recent years they appear to have extended their range northwards with 59 records from British and Irish waters since 1750, the majority (38) after 1998 (Quigley *et al.*, in press, a). There are eleven records of thirteen individuals

in and around the Isles of Scilly since 1996. Two of the females were ovigerous (berried or egg-bearing).

9.3) Kuruma Prawn *Marsupenaeus japonicus*

Since 1989 there have been 14 reports (12 after 2000) of jumbo shrimps from the south west (Dorset to South Wales) and southern Ireland. All those that have been critically examined have been of the Indo-West Pacific species *Marsupenaeus japonicus* (Quigley *et al.*, in press, b). In September 2007 a few jumbo shrimps were caught in shrimp pots around St Martin's (K. Lowe, *pers. comm.* 2009); these may have been of this species.

M. japonicus is used in aquaculture, being farmed semi-extensively in coastal lagoons, in the Atlantic Maritime region of France, and it is assumed that these shrimps had escaped from French facilities, possibly as post-larvae. Specimens have also been found in the Bay of Biscay. Although all of the specimens appear to have been adults and there is currently no evidence to suggest that *M. japonicus* supports a self-sustaining breeding population in UK or Irish waters (Quigley *et al.*, in press, b). Similarly there is as yet no evidence of any adverse effects on the local ecosystems from this non-native species; but it should be noted that in the Eastern Mediterranean where it is believed to have arrived in the 1920s as a Lessepsian migrant (from the Red Sea through the Suez Canal) it has almost evicted the previously commercially important native penaeid prawn *Melicertus kerathurus* (d'Udekem, 1999).

9.4) Curled Octopus *Eledone cirrhosa*

Although the Common Octopus *Octopus vulgaris* probably occurs in the Isles of Scilly, all recent confirmed reports refer to *Eledone cirrhosa*, the Lesser or Curled Octopus. There are occasional records of them throughout the fishing season, but in particular in October 2009; and in September/October 2010 there were reports of a lot of octopuses, ranging in size from large adults to smaller juveniles. These appeared to be entering the pots to feed on the crustaceans within.

E. cirrhosa is a northerly species, which might be expected to decline in southern areas as a result of climate change, but appears to be doing well in the Isles of Scilly at present.

9.5) Sharks

9.5.1) Basking Shark *Cetorhinus maximus* (BAP species)

The Isles of Scilly are not a major area for *C. maximus*, whilst some are seen most years, there are only any numbers when the plankton density is high, usually due to water “fronts” developing in the vicinity of the islands. 2010 was a good years for *C. maximus* numbers. *C. maximus* is the second largest fish in the world.

9.5.2) Porbeagle *Lamna nasus* (BAP species)

L. nasus is not seen in the Isles of Scilly in any numbers and the area is probably not important for the species.

9.5.3) Blue Shark *Prionace glauca* (BAP species)

P. glauca is a largely a summer visitor to the islands: as part of a migration pattern that takes the females and some juveniles from the Atlantic coast of North America to British and Irish coasts, down to Biscay, the Gulf of Cadiz and North west Africa, on to north east South America, and back to the United States. Numbers vary from year to year, but they may be found to the south of St Mary’s or to the west of the islands in the period July to September. This seems to be a summer feeding ground during the migration of a population largely composed of females with some juvenile males. Pregnant females are occasionally seen, and in August 2003 two small pups (one 50 cm and the other 2.3 kg) were caught and released (P. Whittaker, *pers. comm.*, 2010). These could have been born here, or have wandered up from their nursery grounds in the Gulf of Cadiz or the Bay of Biscay (D. Sims and J.D. Stevens, *pers. comm.*, 2010).

9.5.3) Small Sharks

S. canicula is abundant in the area and *S. stellaris* is frequent, *Mustelus* spp. also occur. Small shoals of *S. acanthias* (a BAP species) do occur but are not common.

9.5.4) Angel Shark *Squatina squatina* (BAP species)

S. squatina was a widespread and fairly common shark, but is now endangered and since 2008 protected under the WCA. Sometime ago a large *S. squatina* (c. 27 kg) was caught in a trammel net set for bait, but none have been seen in recent years.

9.6) Rays

9.6.1) Common Skate *Dipturus batis* complex (BAP species)

D. batis is largely extirpated in much of its range but still exists in limited numbers in the south west of Britain. In the 1880s skate of 53 kg were caught at Poll Bank (Smart, 1886); and until they were protected under the WCA skate were still being caught in small numbers in the area and particularly at the mud patch to the west of Bishop Rock. This appears to be an important area for skates and rays and its potential for designation as a Marine Protected Area (MPA) should be investigated.

Recent work has shown that the fish previously recorded as Common Skate (*i.e.* *D. batis*) are actually specimens of two species, the Blue Skate *Dipturus cf. flossada* and the Flapper Skate *Dipturus cf. intermedia* (Iglésias *et al.*, 2009). In a recent study (Griffiths *et al.*, 2010) all the specimens examined genetically from the Western Approaches and Celtic Sea were of their “southern clade”. This appears to equate with *Dipturus cf. flossada*, hence it is probable that at least the majority of skate from around the Isles of Scilly are of this species.

9.6.2) Other rays, Rajidae

The dominant ray in local catches is *R. clavata*, with *L. naevus*; in deeper areas *L. fullonica* and *R. montagui* are commoner. The BAP species *L. circularis* and *R. undulata* are rare around Scilly. Blonde rays (*Raja brachyura*) are now relatively uncommon, but in 1971 they were recorded as common (Isles of Scilly Museum, 1971). The landings of all rays have been down for the last couple of years (D. Thompson, *pers. comm.*, 2010)

9.7) European Sturgeon *Acipenser sturio* (BAP species)

A single *A. sturio* was caught in hake nets in the 1980s. Since the world population of this species depends on a single small breeding stock in the Gironde, in France, little can be done to conserve the species in Scilly, though any that do occur should be treated with the utmost care and reported to the Environment Agency and MMO (and probably the IFCA as well).

9.8) European Eel *Anguilla anguilla* (BAP species)

A. anguilla is a catadromous species breeding in the open Atlantic and settling on the coasts before travelling up rivers in north west Europe. Some can be seen in the islands throughout the year, but each year from January to mid-April there is a passage of *A. anguilla* through the islands. In 2010 they were also frequent in August and September. Most of these fish are 22 to 38 cm long, and can be found in numbers under stones on the shore. They are also found in streams and the marshes of Lower Moors Nature reserve, and probably also in the pools at Porth Hellick, Bryher, Big Pool on St Agnes, and Great Pool on Tresco.

Years ago most eel found around the islands were around 75 cm in length (K. Lowe, *pers. comm.*, 2009).

9.9) Conger Eel *Conger conger*

It has been suggested that the islands gained their name from the misapplication of the Cornish name Silly, Silli or Lilli for an eel, to the congers that were abundant in the islands (Worth, 1850). Worth further notes that prior to his time (*i.e.* in the first half of the nineteenth century) the fishery for *C. conger* was important in Scilly with a stone trough in Old Town being used for salting the fish before it was dried in the sun, to be kept for the winter or exported.

C. conger is still caught from the reefs but seemingly not as large or abundant as previously.

9.10) Allis Shad *Alosa alosa* (BAP species)

The largest European member of the herring family, *A. alosa* is an anadromous species breeding in the freshwater rivers. It is known to breed in the Gironde, Tamar, and probably a few other Westcountry rivers and the Thames complex. It is rare and protected under the WCA.

Generally thought of as an estuarine and coastal species, numbers of large shad have been captured to the north west, west and south west of Scilly by beam trawlers and in hake nets. On one trip one and a half tonnes of shad were caught in hake nets.

9.11) Atlantic Salmon and Sea trout *Salmo salar* and *Salmo trutta* (BAP species)

There is a passage of *S. salar* and *S. trutta* through the islands from January to mid-April. The numbers are probably less today than formerly when some would occasionally get caught in mullet nets.

9.12) Grey Mullet, Mugilidae

There are three species of grey mullet regularly in British waters, but in the Isles of Scilly the only evidence of the Thin-lipped Grey Mullet is a small juvenile found in the mouth of a sea anemone on St Martin's Flats in September 2010, and tentatively identified as *Liza ramada*.

Up until about 20 years ago the only grey mullet caught was *C. labrosus*, but since that time the proportion of *L. aurata* has increased and shoals of up to 200 fish of this species have been caught (B. Jenkins and T. Richards, *pers. comm.*, 2009).

9.13) Small pelagic fish (BAP species)

T. trachurus, *S. scombrus* and *C. harengus* are all BAP species and are the target of pelagic trawlers in the area around the Isles of Scilly.

T. trachurus is fairly numerous and spawns along the continental shelf edge in July (Pawson and Robson, 1996b). In the nineteenth century this fish was taken in great numbers, split, salted and sun-dried to provide a supply of food for the winter

The distribution of feeding shoals of *S. scombrus* is variable, but they spawn around the islands in May and June and can be found in coastal waters through the summer and autumn (Pawson and Robson, 1996b).

C. harengus is common but not as abundant as the other two; they spawn in Cornish estuaries in spring.

S. pilchardus spawn in spring all around the islands, but especially to the south and east. This is the principal spawning grounds for *S. pilchardus* in British waters and follows on from dense wintering concentrations in vicinity of Wolf Rock (Pawson and Robson, 1996b). The distribution of adult shoals of *S. pilchardus* varies from year to year with changing conditions.

9.14) Round Fish

The term “round fish” is used for all demersal bony white fish except the Pleuronectiformes (flatfish).

G. morhua, *M. poutassou*, *M. merlangus*, *M. merluccius*, *M. molva* and *L. piscatorius* are all members of the grouped “commercial marine fish” BAP.

G. morhua are not particularly common around Scilly, however from June to October 2010 there were large numbers of “codling” around. These are small cod of 28 – 38 cm total length. The Minimum Landing Size (MLS) for *G. morhua* is 35 cm, so most had to be returned, but as the season progressed decent sized ones were being caught (D. Thompson, *pers. comm.*, 2010).

M. poutassou is an oceanic fish that while common in deeper waters is rarely seen around the islands (Isles of Scilly Museum, 1971).

M. merlangus are common around the islands; they spawn from January to July on the spawning grounds to the north of Trevoze Head, North Cornwall.

M. merluccius are typically a deeper water fish of the Celtic Sea that spawns over the continental slope (Pawson and Robson, 1996b). They are fished to the north and west of Scilly, but surprisingly are also found in inshore waters.

Stony ground, reefs and wrecks are the habitat of *M. molva*, which spawn mainly along the continental shelf edge. This was a valuable fish in the Victorian era as it was common and good for drying and storing for the winter.

The Reverend R. W. J. Smart in the 1880s caught a *L. piscatorius* of around 55 kg at Poll Bank (Smart, 1886), but most caught recently are relatively small (D. Thompson, *pers. comm.*, 2010). These fish spawn in deep water along the shelf edge mainly between March and June, but juveniles and non-spawning adults can be found throughout area, even in shallow nearshore waters (Pawson and Robson, 1996b).

Common non-BAP species of round fish are *L. bergylta*, *P. pollachius*, *M. aeglefinus*, *A. cuculus*, *C. lucernus*, *E. gurnardus* and *M. surmuletus*.

M. aeglefinus is a northern fish and not normally a major fishery in the south west; however many more have been caught in the region in the last two or three years. This was reflected in Isles of Scilly where small and medium sized *M. aeglefinus* were abundant in inshore waters in 2010 (D. Thompson, *pers. comm.*, 2010).

M. surmuletus may be found on areas sand or sand and stone to east of the islands in February and March and off Peninnis May and June (D. Thompson, *pers. comm.*, 2010).

9.15) Flatfish, Pleuronectiformes

P. platessa and *S. solea* are grouped “commercial marine fish” BAP species; while *M. kitt*, *L. whiffiagonis*, *S. rhombus* and to a lesser extent *L. limanda*, *P. maxima* and *P. lascaris* are common non-BAP species.

P. platessa are one of the commonest flatfish of the area. They spawn off the north coast of Cornwall in spring (Pawson and Robson, 1996b) and the shallow banks in and around the islands provide a nursery ground. They settle on the nursery at 2 to 4 cm after metamorphosis and may remain there for two years (Pawson, 1995).

The area around the Isles of Scilly is a major spawning area for *S. solea* and their principal nursery area is the estuaries and shallow bays of the Bristol Channel and Severn Estuary (Pawson and Robson, 1996b). The adults winter in deeper waters coming into the warmer shallower breeding grounds to spawn from late February to late June with a peak in April and May, returning to their wintering areas in autumn (Pawson, 1995). On the wintering grounds they are object of a considerable beam trawl fishery.

L. whiffiagonis is a species which tends to be found only in deeper water, but like several others in Scilly, it is part of the shallow water community here.

M. kitt may live down to 200 m but inshore around the Isles of Scilly their distribution is very patchy in areas of stone and sand. They do not migrate and stay around one area where their peak spawning is April to June, but the nursery grounds have not been identified and may be in areas of rocks and boulders (Pawson, 1995)

In 1886 Smart commented “... flat-fish are becoming yearly more scarce, from the innumerable number of shags and cormorants fishing over the flats and destroying

young fish.” It is a similar tale today; and it seems inevitable that the flocks of Shags (*Phalacrocorax aristotelis*) gathering over the major flatfish nursery grounds of St Martin’s Flats will have an impact on stocks. However, it is feasible that the natural mortality of the “O” group fish is so high that the effect is insignificant. The colony of *P. aristotelis* on the Western Rocks is one of the largest in the south west and of considerable conservation importance (Tasker, 1996).

9.16) Seahorses, *Hippocampus guttulatus* and *Hippocampus hippocampus* (BAP species)

Seahorses are found in a variety of habitats, but are best known for living in seagrass meadows. However, despite the extensive eel grass beds, there are few records of seahorses in and around the Isles of Scilly. Fishermen say they are very unusual but are occasionally found by shrimp collectors, who would be fishing over the sandflats. ERCCIS only holds two records of these fish – a Short-snouted Seahorse (*Hippocampus hippocampus*) found in 1982, ‘probably Tresco’; and a Spiny or Maned Seahorse (*Hippocampus guttulatus*) from Toll Island, St Mary’s in October 2003. The habitat around Toll Island is boulders with a hydroid turf and algae that can suit *Hippocampus* sp. The “probably Tresco” fish could have come from the sandflats or more likely the *Zostera* beds. There is one specimen of *Hippocampus hippocampus* in the Isles of Scilly Museum, but without date or location, this may be the Tresco fish.

It is understood that the British Seahorse Survey, run by the Seahorse Trust, does hold some records from the Isles of Scilly, all of which are of *H. hippocampus*.

9.17) Sandeels, Ammodytidae

It is probable that several species of sandeel are found in the area and the Isles of Scilly Museum (1971) recorded both the Greater Sandeel *Hyperoplus lanceolatus* and the Lesser Sandeel *Ammodytes tobianus*. The Porcupine Marine Natural History Society intertidal study found a number of *A. tobianus* in the sand on St Martin’s Flats.

One sandeel found dead on St Martin’s Flats was identified as Raitt’s Sandeel *Ammodytes marinus*, a BAP species. Generally this species is considered to occur in deeper water than *A. tobianus*. However, since it was found dead it is impossible to draw any conclusions from this. A variety of frozen sandeels are imported to Scilly for sale as anglers’ bait, and that is a possible origin of this specimen. On the other hand, *A. marinus* are frequently caught along with other species, in depths of 5 to 12 metres

off the Cornish coast (M. Gilbert, *pers. comm.*, 2010), and so naturally occurring *A. marinus* is a possibility in the coastal waters of Scilly.

9.18) Gobies, Gobiidae

Eight species of goby have been recorded from the Isles of Scilly (Isles of Scilly Museum, 1971; Hussain and Knight-Jones, 1995; Parslow, 2000; and ERCCIS, 2010), out of nineteen or twenty one species found in the British Isles and surrounding waters. In part this apparent paucity of species is probably an artefact of the lack of collecting and recording of these small fish. Many of the records are of *Gobius* sp. or *Pomatoschistus* sp., and have not been determined to species level.

T. ephippiatus was first discovered in British seas in the 1950s with the advent of scientific diving and is now known to be relatively common in suitable habitats.

The other large gobies recorded are *G. paganellus*, *G. cobitis* and the Black Goby *G. niger*. The only record found of *G. niger* in the islands is in the museum list (Isles of Scilly Museum, 1971), where it is noted along with *G. paganellus* as “Both found in rock pools.” This is strange because while *G. niger* might be found on the lower shore, it is more commonly a sublittoral species (living at depths of 2 to 70 m) on muddy and sandy bottoms, especially in estuaries and lagoons (Maitland and Herdson, 2009). This species may occur in the area, as they are frequently associated with *Zostera* beds, but none have been reported from that habitat in Scilly. However, the museum list does not mention *G. cobitis*, which is a similar size and colouration to *G. niger* and is almost exclusively found in upper shore rock pools. *G. cobitis* was only fully accepted as a British species in 1960 (Wheeler, 1960) and did not appear in most fish identification guides until the 1970s. Hence it is feasible that the species referred to is not *G. niger* but *G. cobitis*.

G. cobitis is a subtidal species in the Mediterranean but in the United Kingdom is confined to large upper shore rockpools in south west Devon, Cornwall and the Isles of Scilly (Fig. 2). The second largest European goby, it is rare and vulnerable to disturbance with a significant population in Scilly (Potts and Swaby, 1995). *G. cobitis* is listed on Schedule V of the Wildlife and Countryside Act 1981, which protects them from intentional killing, injuring or taking (Lewis *et al.* 2008). This species has been regularly recorded in Scilly (Potts and Swaby, 1992; Wheeler, 1993; Hussain and Knight-Jones, 1995; Parslow, 2000). However, as mentioned previously, during the Porcupine Marine Natural History Society field meeting several large gobies (11-14 cm

in total length) were found in upper shore rockpools on St Mary's and St Agnes, and also on Gugh and St Martin's (B. Cowburn *pers. comm.*, 2010), some were readily identified as *G. paganellus* by a pale or bright orange band along the upper edge of the first dorsal fin, but other apparently similar specimens lacked this (Fig. 3). These fish lacked the "pepper and salt" colouration of a typical British *G. cobitis*. They were closely and carefully examined in the hand and photographed, but it was found virtually impossible to distinguish these gobies from *G. paganellus*. The tentacles of the anterior nostrils, the free rays of the pectoral fin and the membrane of the pelvic disc are similar in these two species; and they are even reported to hybridise in the Black Sea. Until an observer is familiar with both species it seems they are best separated by minor differences of the lateral line system of the head, and the number of scales in the lateral series 59–67 in *G. cobitis* and 46-59 in *G. paganellus*. While *G. cobitis* can grow to 270 mm, size is not a good indicator as *G. paganellus* can reach 120 to 140 mm, and most of the *G. cobitis* found by Wheeler (1993) were small (13-80 mm) and only a few larger ones of 120-180 mm. A detailed study of the distribution and status of this enigmatic species in the islands is highly recommended, however it would require a licence from Natural England. Such a project would unfortunately not be directly comparable with previous studies as these largely involved emptying the rockpools, or the addition of anaesthetic or toxic substances to the pools, neither of which would be acceptable with a protected species today.



Figure 2. *Gobius cobitis*, Marazion, January 2010.

© David Fenwick snr



Figure 3. *Gobius* sp. St Agnes, September 2010. © Matt Davison

G. paganellus is one of the commonest shore fish, found under stones and in pools the lower parts of most hard substrate shores. In contrast with its normal distribution, on Scilly it is also found in upper shore rockpools, apparently another example of a species on the islands being found at a higher tidal level than in its general distribution.

Of the smaller gobies, *G. flavescens* is the most widespread and readily identifiable being found around weed and in a variety of habitats.

Gobies of the *Pomatoschistus* genus are abundant, particularly in sandy areas but difficult to identify, especially by sight. *P. pictus* is fairly distinctive and is most likely to occur on gravels and coarse sand, hence it has been found in tide-swept channels, but should also be looked for on sands adjacent to rocks and in areas of *Zostera*. *P. microps* and *P. minutus* are abundant in sandy bays, over sandflats, and in the channels. *P. microps* and *P. minutus* also occur in the Great Pool, on Bryher (Parslow, 2000; Bamber *et al.*, 2001). Lozano's Goby *Pomatoschistus lozanoi* is an inshore species that has never been recorded in Isles of Scilly but may well occur; it is very similar to *P. minutus* from which it can only safely be separated by the pattern of the cheek papillae.

9.19) Grey Triggerfish *Balistes capricus*

This is southern species, which is extending its range ever northward, is now being reported from the north of Scotland and the North Sea. It was first recorded from Cornwall in 1865; and the first sighting in the Isles of Scilly is disputed with claims of 1971 (K. Lowe, *pers. comm.*, 2009); August 1970 "the 'third ever' British triggerfish

found in the shallow river (*sic*) on St Martin's by schoolboy John Dallimore" (Fishing News, August 2010); and "One caught in wrasse pot in 1962" (Isles of Scilly Museum, 1971).

Whilst in parts of the mainland fair numbers of *B. capriscus* can be encountered each summer; they are not infrequent, but never common in Scilly. They have been trapped in pots, caught by anglers, seen from boats, observed by divers, and discovered dead on the shore. In 2010 none were caught by anglers nor reported by fishermen, but one was seen south of St Mary's in July and a dead one was picked up from the rocks on the north of St Martin's in August (A. Hicks and T. Wolfe *pers. comm.* 2010). Most commonly *B. capriscus* is found stranded on beaches from November to January, but the strandings in Scilly have been in February, April and August.

9.20) Pearlside *Maurolicus muelleri*

These tiny (3 to 5 cm) mesopelagic fish are probably abundant in the mid-depths over the continental shelf but because they are too small to be held in most nets are seldom seen. Two individuals were washed up dead on beaches on St Mary's and Bryher early 2008. However, from December 2008 to February 2009 81 of these fish were found on beaches around St Mary's (Hathway and Herdson, 2009). None were reported the following winter.

10) Spawning and Nursery areas

10.1) Grey Mullet, Mugilidae

The shallow sandy bay of Porth Hellick, St Mary's, is a known spawning ground for *C. labrosus*, and possibly *L. aurata* as well (De Thompson. *pers. comm.*, 2009).

10.2) Plaice, *P. platessa*

The intertidal survey in September 2010 found small *P. platessa* in Bryher Channel; and large numbers of "O" group fish (2 to 5 cm) over much of St Martin's Flats and in Old Town Bay, St Mary's. A few year 1 (*ca* 12 cm) *P. platessa* were also collected on St Martin's Flats. The abundance of these young fish points to the shallow waters around and especially within the islands being an important nursery ground for the species.

10.3) Brill, *Scophthalmus rhombus*

Surprisingly, no juvenile *P. maxima* or *S. rhombus* were found when push netting during the intertidal survey in September; but lots of juvenile *S. rhombus* were seen in the shallows in Higher Town Bay, St Martin's, in August (S. Walder, *pers. comm.*, 2010)

11) Sustainability

The fisheries of the Isles of Scilly are generally small-scale and localized. They are of social and economic importance to the islands and appear to have low environmental impact. However is this the case? – are they “sustainable”?

11.1) What makes fishing “sustainable”?

There are three principal criteria by which a fishery can be judged in terms of its environmental sustainability.

11.1.1) Impact on the fished stock

Does the targeted stock have the ability to maintain or increase its breeding biomass? What is the size of the fished stock? How does this compare with the unexploited stock size and productivity? What size are the fish caught? How capable is the stock of replacing the catch? What about discards?

11.1.2) By-catch

Is the unintended by-catch threatening the sustainability of populations of non-target species? What is the by-catch of creatures other than those targeted? Is any of the by-catch putting pressure on those populations? Is the by-catch acceptable? What is an acceptable by-catch? Does it include any protected or endangered or BAP species?

11.1.3) Environmental impact

Is the fishery damaging the biodiversity of the habitats where fishing is taking place? What are the environmental impacts of the fishing methods utilized? – damage to sea bed habitats; ecosystem structure etc. What about the “carbon footprint”/ fuel usage? What about “ghost fishing” (the continued catching and killing of animals by lost fishing gear, until the virtually indestructible materials of the net or pot breakdown)?

11.2) Crustacean fisheries

11.2.1) Crab and Lobster

Robson (1996a) wrote “To keep this fishery economically viable, fishermen have steadily increased the number of pots set per boat, as catch rates and market prices have fallen.” There is some hearsay that this still the case; it cannot be known without a full directed study of this fishery with detailed statistical analysis of data that may not be available.

The measures adopted for the management of the lobster stocks include the increase of the Minimum Landing Size (MLS) from 87 mm carapace length to 90 mm, and a voluntary V-notching scheme. In a V-notching scheme, the fisherman who catches a lobster just under the MLS or an ovigerous (berried) female will cut a V in its “tail” (Uropods or telson). This will remain until the lobster grows and moults. A V-notched lobster should not be landed and will not be accepted by the Cornish wholesalers. These actions may help the lobster population.

11.2.2) Crawfish

There is a lot of anecdotal evidence that the population of *P. elephas* has declined dramatically. Indeed Pawson and Robson (1996a) commented “It is thought that overfishing has had a serious impact on stocks of migratory species, such as crawfish. Some fishermen also attribute the decline of crawfish stocks to the over-use of tangle nets.” However, it is known that the recruitment of young crawfish can be extremely variable and dependent on environmental conditions, and the effects of these cannot be completely ruled out. It is hopeful that in 2010 higher than usual numbers of young crawfish have been seen.

11.3 Fish

At present there are no obvious signs of problems, but tales of smaller fish and lower catch rates – “Never the same after the “Mackerel Bonanza” of the late 1970s and early 1980s”, suggest there could be a problem.

An interesting comparison can be made of the angling catches of the Reverend Smart in the 1880s, and the largest fish reported by anglers in 2008, as recorded by David Townend in the 2009 Isles of Scilly Tide Tables (Table 1).

Table 1. Records of “good” fish taken by anglers in 1885 and 2008

Year	1885	2008
Source	Smart, 1886	Townend, 2008 (tide tables)
Ling	27 lb	13½ lb
Cod	Average – 20 lb	8 lb
Pollack		7 lb

These show a decline of 50% or more in the weight of “good” fish over the last 120 years.

There could be number of explanations including food supply, predation or climate change, but overfishing seems the most likely.

This is “Growth overfishing” where the fish are harvested a size smaller than that which would produce the best yield. There could also be “Recruitment overfishing” where the mature adult population – the spawning biomass – is reduced to a size where it can no longer maintain the optimum stock level. This was described by Jones *et al.* (2004) who found that the spawning biomass of mackerel in the south west had fallen since the mid 1980s.

The management of the fisheries at present consists of limitations on the vessels and their sizes that can fish within 6 miles of the islands, MLSs and the minimum mesh size (currently 80 mm). Outside of 6 miles most management comes under the Common Fisheries Policy of the European Union. The exposed nature of the area means that there is effectively a closed season for the relatively small inshore vessels that fish here from November to March due to bad weather.

Measures to aid the recovery of local stocks could include increases in mesh size, the introduction of square mesh panels into trawl nets and the establishment of Marine Protected Areas. The incoming IFCA will have responsibility to manage any Marine Conservation Zones, but it is not yet known what management the MMO will decide on for these. It would appear highly desirable, that some areas at least, should be designated highly-protected MPAs; effectively “No-Take-Zones” where towed gears (trawls and dredges), fixed engines (traps, pots and set nets), collection by divers and

angling would be excluded. If carefully selected such zones could indicate whether these measures can help stocks to build up in quantity and mean size of the fish.

Areas suggested for consideration to become MPAs include the Flats, the “Mud patch”, the Nundeeps, and an area from the Eastern Isles and along to the south of St Mary’s.

12) Acknowledgements

Thanks are due to Alec Hicks, Joe Pender (charter boat skippers); David Townend, Del Thompson, John Mallatratt, Paul Whittaker (anglers); Kit and Harry Legg, David Thompson, Ian Mitchell, Brian Jenkins, Tim Richards, Martin Bond, Keith Lowe and Steve Walder (fishermen); Ren Hathway, Ian Wrigley; Seasearch and other divers; participants in the Porcupine Marine Natural History Society Field meeting; Dr Peter Miller for advice on identification; Dr Stephen D. Simpson, University of Bristol, for the CEFAS trawl data; Beccy Oliver (Shoresearch), Ben Cowburn (IoSWT volunteer), staff and volunteers at Isles of Scilly Wildlife Trust; and, especially for her help and forbearance, Angie Gall (the Isles of Scilly Marine Biodiversity Project Officer).

APPENDICES

A) Fish and shellfish of the Isles of Scilly

Species	English Name	Scilly and other Names
<i>Cancer pagurus</i>	Edible Crab	Edible or Brown Crab
<i>Crangon crangon</i>	Brown Shrimp	
<i>Homarus gammarus</i>	Atlantic Lobster	
<i>Marsupenaeus japonicus</i>	Kuruma Prawn	Jumbo Shrimp
<i>Necora puber</i>	Velvet Swimming Crab	Velvet Crab
Palaemonidae	Prawns	Shrimps
<i>Palinurus elephas</i>	European Spiny Lobster	Crayfish, Crawfish
<i>Scyllarus arctus</i>	Little Slipper Lobster	Slipper Lobster
<i>Eledone cirrhosa</i>	Curled or Lesser Octopus	Octopus
<i>Branchiostoma lanceolatum</i>	Lancelet or Amphioxus	
<i>Cetorhinus maximus</i>	Basking Shark	
<i>Dasyatis pastinaca</i>	Common Stingray	
<i>Dipturus batis complex*</i>	Common Skate	
<i>Heptranchias perlo</i>	Sharpnose Sevengill Shark	
<i>Hexanchus griseus</i>	Bluntnose Sixgill Shark	
<i>Lamna nasus</i>	Porbeagle	Porgie
<i>Leucoraja circularis</i>	Sandy Ray	
<i>Leucoraja fullonica</i>	Shagreen Ray	
<i>Leucoraja naevus</i>	Cuckoo Ray	Starry Ray
<i>Mustela spp.</i>	Smooth Hounds	
<i>Prionace glauca</i>	Blue Shark	
<i>Raja brachyura</i>	Blonde Ray	
<i>Raja clavata</i>	Thornback Ray	
<i>Raja montagui</i>	Spotted Ray	
<i>Raja undulata</i>	Undulate Ray	
<i>Scyliorhinus canicula</i>	Lesser Spotted Dogfish (Small Spotted Catshark)	Sand Dog, Mergie Dog
<i>Scyliorhinus stellaris</i>	Nursehound	Bull Huss
<i>Squalus acanthias</i>	Spurdog	
<i>Squatina squatina</i>	Angel Shark or Monkfish	Buffon
<i>Acipenser sturio</i>	European Sturgeon	
<i>Alosa alosa</i>	Allis Shad	
<i>Ammodytes marinus</i>	Raitt's Sandeel	
<i>Ammodytes tobianus</i>	Lesser Sandeel	
Ammodytidae	Sandeels	
<i>Anguilla anguilla</i>	European Eel	Lilly, Silli, Silya, Broad-nosed Eel
<i>Apletodon dentatus</i>	Small-headed Clingfish	
<i>Arnoglossus imperialis</i>	Imperial Scaldfish	
<i>Arnoglossus laterna</i>	Scaldfish	
<i>Aspitrigla cuculus</i>	Red Gurnard	
<i>Atherina boyeri</i>	Sand Smelt	
<i>Balistes capriscus</i>	Grey Triggerfish	Filefish

<i>Belone belone</i>	Garfish	
<i>Callionymus lyra</i>	Common Dragonet	
<i>Callionymus maculatus</i>	Spotted Dragonet	
<i>Callionymus sp.</i>	Dragonets	
<i>Capros aper</i>	Boarfish	Zulu
<i>Centrolabrus exoletus</i>	Rock Cook	
<i>Centrolophus niger</i>	Blackfish	
<i>Chelidonichthys lucernus</i>	Tub Gurnard	
<i>Chelon labrosus</i>	Thick-lipped Grey Mullet	
<i>Chirolophis ascanii</i>	Yarrell's Blenny	
<i>Ciliata mustela</i>	Five-bearded Rockling	Whistler ?
<i>Clupea harengus</i>	Herring	
<i>Conger conger</i>	Conger Eel	Sleane, Silya
<i>Coryphoblennius galerita</i>	Montagu's Blenny	
<i>Crenilabrus melops</i>	Corkwing Wrasse	
<i>Ctenolabrus rupestris</i>	Goldsinny	
<i>Cyclopterus lumpus</i>	Lumpsucker	
<i>Diplecogaster bimaculatus</i>	Two-spotted Clingfish	Two-spot Sucker
<i>Eutrigla gurnardus</i>	Grey Gurnard	
<i>Gadus morhua</i>	Cod	Codling (small)
<i>Gaidropsarus mediterraneus</i>	Shore Rockling	Whistler
<i>Gaidropsarus vulgaris</i>	Three-bearded Rockling	Pettifox
<i>Glyptocephalus cynoglossus</i>	Witch	
<i>Gobius cobitis</i>	Giant Goby	
<i>Gobius paganellus</i>	Rock Goby	
<i>Gobiusculus flavescens</i>	Two-spotted Goby	
<i>Hippocampus guttulatus</i>	Spiny or Maned Seahorse	
<i>Hippocampus hippocampus</i>	Short-snouted Seahorse	
<i>Labrus bergylta</i>	Ballan Wrasse	
<i>Labrus mixtus</i>	Cuckoo Wrasse	
<i>Lepadogaster candolii</i>	Connemara Clingfish	
<i>Lepadogaster purpurea</i>	Shore Clingfish	Cornish Sucker
<i>Lepidorhombus boscii</i>	Four-spot Megrin	
<i>Lepidorhombus whiffiagonis</i>	Megrin	
<i>Limanda limanda</i>	Dab	
<i>Liparis montagui</i>	Montagu's Sea Snail	
<i>Lipophrys pholis</i>	Shanny	Shan, Garlup, Common Blenny
<i>Liza aurata</i>	Golden Grey Mullet	Goldeneye
<i>Lophius budegassa</i>	Black-bellied Angler	
<i>Lophius piscatorius</i>	Anglerfish	Monk, Sea-Devil
<i>Makaira nigricans</i>	Blue Marlin	
<i>Maurolicus muelleri</i>	Pearlside	
<i>Melanogrammus aeglefinus</i>	Haddock	
<i>Merlangius merlangus</i>	Whiting	
<i>Merluccius merluccius</i>	Hake	
<i>Microchirus variegatus</i>	Thickback Sole	
<i>Micromesistius poutassou</i>	Blue Whiting	Poutassou
<i>Microstomus kitt</i>	Lemon Sole	
<i>Mola mola</i>	Oceanic Sunfish	Sunfish
<i>Molva molva</i>	Ling	
<i>Muraena helena</i>	Mediterranean Moray	Moray Eel
Mugilidae	Grey Mullet	Mullet
<i>Mullus surmuletus</i>	Red Mullet	

<i>Nerophis lumbriciformis</i>	Worm Pipefish	
<i>Parablennius gattorugine</i>	Tompot Blenny	
<i>Parablennius ruber</i>	Red Blenny	
<i>Pegusa lascaris</i>	Sand Sole	
<i>Pholis gunnellus</i>	Butterfish or Gunnel	Gundells, Nine Eyes
<i>Phrynorhombus norvegicus</i>	Norwegian Topknot	
<i>Pleuronectes platessa</i>	Plaice	
<i>Pollachius pollachius</i>	Pollack	
<i>Pollachius virens</i>	Saithe	Coalfish, Coley
<i>Polyprion americanus</i>	Wreckfish	Stone Bass
<i>Pomatoschistus microps</i>	Common Goby	
<i>Pomatoschistus minutus</i>	Sand Goby	
<i>Pomatoschistus pictus</i>	Painted Goby	Painty Goby
<i>Psetta maxima</i>	Turbot	
<i>Raniceps raninus</i>	Tadpole Fish	Lesser Forkbeard
<i>Remora remora</i>	Remora	
<i>Salmo salar</i>	Atlantic Salmon	
<i>Salmo trutta</i>	Sea Trout	
<i>Sardina pilchardus</i>	Pilchard	
<i>Schedophilus ovalis</i>	Imperial Blackfish	
<i>Scomber colias</i>	Atlantic Chub Mackerel	
<i>Scomber scombrus</i>	Mackerel	
<i>Scophthalmus rhombus</i>	Brill	
<i>Serranus cabrilla</i>	Comber	
<i>Solea solea</i>	Common Sole	Dover Sole
<i>Spinachia spinachia</i>	15-spined Stickleback	Sea Stickleback
<i>Sprattus sprattus</i>	Sprat	
<i>Syngnathus acus</i>	Greater pipefish	
<i>Taurulus bulbalis</i>	Long-Spined Sea Scorpion	Long-spined Bullhead
<i>Thorogobius ephippiatus</i>	Leopard-spotted Goby	
<i>Trachurus trachurus</i>	Horse Mackerel	Scad
<i>Trisopterus esmarkii</i>	Norway Pout	
<i>Trisopterus luscus</i>	Bib	Whiting-pout, Pout
<i>Trisopterus minutus</i>	Poor Cod	
<i>Zenopsis conchifer</i>	Sailfin Dory	
<i>Zeugopterus punctatus</i>	Topknot	
<i>Zeus faber</i>	John Dory	

* *Dipturus batis* complex – recent work has shown that the fish recorded as Common Skate are actually specimens of both the Blue Skate *Dipturus* cf. *flossada*, and the Flapper Skate *Dipturus* cf. *intermedia*.

B) Bibliography on the Fish and Fisheries of the Isles of Scilly

Allsop, T. and Cawthray, A. (2009) *Underwater Scilly*. Marshfield Underwater Publications, 116pp.

Aprahamian M and Robson CF (1996) Chapter 5.8 Fish: Salmon, sea trout and eels. In: Barne JH, Robson CF, Kaznowska SS, Davidson NC, Doody JP and Buck AL (Ed.) (1996) *Coasts and Seas of the United Kingdom, Region 11. The Western Approaches (Falmouth Bay to Kenfig)*. Peterborough, Joint Nature Conservation Committee.

Atlantic Consultants (1995) *Sustainable economic development strategy: research report for the Council of the Isles of Scilly*. Truro, Atlantic Consultants.

Bamber, R N, Evans, N J, Chimonides, P J, and Williams, B A P (2001) *Investigations into the hydrology, flora and fauna of the pool of Bryher, Isles of Scilly*. Natural History Museum Consulting, Report No. ECM 759101

Browne, E. T. and Vallentin, R. (1903–1905) On the marine fauna of the Isles of Scilly. I The pelagic fauna. *Journal of the Institute of Cornwall*, **16**; 120-132.

Council of the Isles of Scilly. (1995) *Sustainable economic development strategy: 1995 and beyond*. St. Mary's, Council of the Isles of Scilly.

Duck, C.D. (1996) Chapter 5.14 Seals. In: Barne JH, Robson CF, Kaznowska SS, Davidson NC, Doody JP and Buck AL (Ed.) (1996) *Coasts and Seas of the United Kingdom, Region 11. The Western Approaches (Falmouth Bay to Kenfig)*. Peterborough, Joint Nature Conservation Committee.

d'Udekem d'Acoz, C. (1999) Inventaire et distribution des crustacés décapodes de l'Atlantique nord-oriental, de la Méditerranée et des eaux continentales adjacentes au nord de 25°N. *Muséum National d'Histoire Naturelle. Patrimoines naturels*, **40**: 1-383.

Gainey, P.A. (2009) *Marine and Estuarine Fish*. In: CISFBR, *Red Data Book for Cornwall and the Isles of Scilly. (2nd Edition)* Croceago Press, Praze-an-Beeble.

Garrick-Maidment, N. (2007) *British Seahorse Survey 2007*. The Seahorse Trust.

Gilbert, D., Hals, W., Tonkin, T., Boase, H.S. (1838) [The Parochial History of Cornwall, Volume IV.](#)

Goodwin C.E. and Picton B.E. (2007) The red blenny *Parablennius ruber* in the British Isles, with notes on field identification characteristics and ecology. *Journal of the Marine Biological Association of the U.K.* **87**(5): 1309-1313

Gray, M. J. (1995) The coastal fisheries of England and Wales, Part III: a review of their status 1992-1994. *MAFF Fisheries Research Technical Report*, Lowestoft, **100**.

Griffiths, A.M., Sims, D.W., Cotterell, S.P., El Nagar, A., Ellis, J.R., Lynghammar, A., McHugh, M., Neat, F.C., Pade, N.G., Queiroz, N., Barbara Serra-Pereira, B., Rapp, T., Wearmouth, V.J., and Martin J. Genner, M.J. (2010) Molecular markers reveal spatially segregated cryptic species in a critically endangered fish, the common skate (*Dipturus batis*). *Proceedings of the Royal Society, B* (2010) **277**, 1497–1503

Harvey LA (1969) The marine flora and fauna of the Isles of Scilly: the islands and their ecology. *Journal of Natural History* **3**: 3-18

Hathway, R. and Herdson, D. (2009) The unusual occurrence of Pearlsides in Scilly. *Isles of Scilly Bird and Natural History Review* **2008**, 132-133.

Herdson, D. (2001) Slipper Lobster *Scyllarus arctus*. *Isles of Scilly Bird and Natural History Review* **2001**, 180-182.

Hussain, N.A. and Knight-Jones, E.W. (1995) Fish and fish-lice on rocky shores around Britain. *Journal of the Marine Biological Association of the U.K.* **75**: 311-322.

Iglésias, S. P., Toulhoat, L. and Sellos, D.Y. (2010) Taxonomic confusion and market mislabelling of threatened skates: important consequences for their conservation status. *Aquatic Conservation: Marine and Freshwater Ecosystems*. **20**(3), 319-333

Isles of Scilly Museum Association (1971) Fish around the Isles of Scilly (revised). *Isles of Scilly Museum publication No. 1*

Jones L.A., Irving R., Cork M., Coyle M.D., Evans D., Gilliland P.M. and Murray A.R. (2004) *South Western Peninsula Marine Natural Area Profile: A contribution to regional planning and management of the seas around England*. Peterborough: English Nature.

Lewis, G., Parslow, R., Gall, A. and McCartney, P. (2008) The Isles of Scilly Biodiversity Audit 2008. *Environmental Records Centre for Cornwall and the Isles of Scilly*, 124 pages

Maitland, P.S. and Herdson, D. (2009) *Key to the Marine and Freshwater Fishes of Britain and Ireland. A guide to the identification of more than 370 species.* Environment Agency, Bristol. 476p.

Mammal Society (2010) The Grey Seal *Halichoerus grypus*. *The Mammal Society Factsheet*. http://www.mammal.org.uk/index.php?option=com_content&id=238

North, I.W. (1850) *A Week in Isles of Scilly*. London, Longman and Co.

Parslow, R. (c. 2000) List of shore fishes of the Isles of Scilly. Unpublished manuscript.

Pawson, M. G. (1995) Biogeographical identification of English Channel fish and shellfish stocks. *MAFF Fisheries Research Technical Report*, Lowestoft, **99**, 72 pages

Pawson, M.G. and Robson, C.F. (1996a) Chapter 5.5 Exploited sea bed species. In: Barne JH, Robson CF, Kaznowska SS, Davidson NC, Doody JP and Buck AL (Eds) (1996) *Coasts and Seas of the United Kingdom, Region 11. The Western Approaches (Falmouth Bay to Kenfig)*. Peterborough, Joint Nature Conservation Committee.

Pawson, M.G. and Robson, C.F. (1996b) Chapter 5.7 Fish: Exploited sea fish. In: Barne JH, Robson CF, Kaznowska SS, Davidson NC, Doody JP and Buck AL (Eds) (1996) *Coasts and Seas of the United Kingdom, Region 11. The Western Approaches (Falmouth Bay to Kenfig)*. Peterborough, Joint Nature Conservation Committee.

Pawson, M. G., Pickett, G. D. and Walker, P. (2002) The coastal fisheries of England and Wales, Part IV: a review of their status 1999-2001. *CEFAS Science Series Technical Report*, Lowestoft, **116**, 83 pages

Potts G and Swaby S (1992), *The current status of the Giant Goby Gobius cobitis Pallas, in the British Isles*. Report to Joint Nature Conservation Committee, contract No. 99. Marine Biological Association Plymouth

Potts G and Swaby S (1995) *Species Recovery Project - The Giant Goby in the South West of England*. Report to English Nature, Marine Biological Association Plymouth

Potts G and Swaby S (1996) Chapter 5.9 Fish: other species. In: Barne JH, Robson CF, Kaznowska SS, Davidson NC, Doody JP and Buck AL (Ed.) (1996) *Coasts and Seas of the United Kingdom, Region 11. The Western Approaches (Falmouth Bay to Kenfig)*. Peterborough, Joint Nature Conservation Committee.

Quigley, D.T.G., Flannery, K., Herdson, D., Lord, R. and Holmes, J.M.C (In press, a) Slipper Lobster (*Scyllarus arctus* (L.)) (Crustacea: Decapoda) from in Irish, U.K. and Channel Island waters. *Irish Naturalists Journal*, **31**(1), 33 - 39

Quigley, D.T.G., Herdson, D and Flannery, K. (In press, b) Occurrence of the Asian Japanese or Kuruma prawn *Marsupenaeus (Penaeus) japonicus* Bate, 1888 from the Celtic Sea and English Channel. *Aquatic Invasions Records*.

Robson C.F. (1996a) Chapter 9.1 Fisheries. In: Barne JH, Robson CF, Kaznowska SS, Davidson NC, Doody JP and Buck AL (Eds) (1996) *Coasts and Seas of the United Kingdom, Region 11. The Western Approaches (Falmouth Bay to Kenfig)*. Peterborough, Joint Nature Conservation Committee.

Robson C.F. (1996b) Chapter 9.2 Mariculture. In: Barne JH, Robson CF, Kaznowska SS, Davidson NC, Doody JP and Buck AL (Eds) (1996) *Coasts and Seas of the United Kingdom, Region 11. The Western Approaches (Falmouth Bay to Kenfig)*. Peterborough, Joint Nature Conservation Committee.

Smart, R. W. J (1886) Line-fishing off the Scilly Islands. *Journal of Penzance Natural History Society*, (**1884 – 1888**), p. 386-387.

Tait, R.V., and Dipper, F.A. (1998) *Elements of Marine Ecology*. (4th Edn). Oxford, Butterworth-Heinemann.

Tasker, M.L. (1996) Chapter 5.10 Seabirds. In: Barne JH, Robson CF, Kaznowska SS, Davidson NC, Doody JP and Buck AL (Ed.) (1996) *Coasts and Seas of the United Kingdom, Region 11. The Western Approaches (Falmouth Bay to Kenfig)*. Peterborough, Joint Nature Conservation Committee.

UK BAP (2009) *2007 UK BAP priority species*. *Palinurus elephas* (Fabricius, 1787), *Crayfish, Crawfish or Spiny Lobster*. UK Priority Species Data Collation.

Valentin R (1909) Additional notes on the fauna of the Scilly Isles. *Journal of the Institute of Cornwall* **17**, 351- 358

Warnes, S. and Jones, B.W W. (1995) Species distributions from English Celtic Sea groundfish surveys, 1984 to 1991. *MAFF Fisheries Research Technical Report*, Lowestoft, **98**, 42 pages

Wheeler, A. (1960) *Gobius capito* as a British fish. *Annals and magazine of natural history*, **13**, 3: 177-181.

Wheeler, A.W. (1993) The distribution of *Gobius cobitis* in the British Isles. *Journal of Fish Biology*, **43**, 4, October 1993, 652–655,

Whittaker, P. (2001) Why tag sharks? *Isles of Scilly Bird and Natural History Review* **2001**, 179-180

Woodley, G. (1822) *A View of the Present State of the Scilly Islands*. London, Longman & Co.

C) Fishing vessels of Isles of Scilly (2010)

(Act = thought to be currently active in the area, November 2010)

St Mary's

Regn. No.	Vessel	Skipper	Comments
SC11 Act	Victory of Helford	Tim Richards	Tangle netter. Only >11 m vessel. Member of CFPO
SC17 Act	Atlantis	Stuart Thomas	Crabber/potter
SC32 Act	Vicky Anna	Barry Bennett	Potter
SC46 Act	Swan Dancer	David Thompson	Trawler, Sold to Scotland, October 2010
SC70 Act	Curlew (built 1948)	Brian Jenkins	Potter (140 pots)
SC167 Act	Maiden Bower	Andy Frazer	
SC172 Act	Pontious		Small open boat
SC177 Act	Gallos	Robert Francis	Potter, owned by the Star Castle Hotel,
SC183 Act	Retarrier	Ben Blackwell and Peter Watts	Potting, and netting for pollack
PW23	Sarafina	Mark Pender	
PZ172		Clive Humphrey	
SS149	Maranatha	William Thomas	
TH424 Act	Kay Larie		
		Brian Richards	Shrimping
SS30	Rosebud		Small open boat
	Act Blue Mist	Ian Wrigley	Non-commercial rod and line and potting
	Snowy Owl		Non-commercial netting and potting

Bryher

Regn. No.	Vessel	Skipper	Comments
SC35 Act	Emerald Dawn	Mike Pender	Potter,
FY1 Act	Southern Star	Richard and John Jenkins	Potter

Tresco

Regn. No.	Vessel	Skipper	Comments
SC8	Samson	Stuart Jenkins	
SC169	Lorraine Ruth	Mike Isles	
		Bruce Christopher	
		Billy Prichard	

St Martin's

Regn. No.	Vessel	Skipper	Comments
SC2 Act	Lowena	Steve Walder	
SC4 Act	Rockhopper	Keith Lowe	Potting and beach seine for mullet
SC16	Northern Star	Viv Jackson	
SC76 Act	Pelican	Keith Ashford	Small open dingy
SC168	Boy Adam	Adam Morton	
SC173 Act	Resolution	Adam Morton	Netter
SC181 Act	Sowenna	Ian Mitchell	Catamaran, netter and longline

St Agnes

Regn. No.	Vessel	Skipper	Comments
	O N M	Mike Hicks	Hobby fisherman, not registered
SC41 Act	Pioneer	Kit and Harry Legg	240 pots and set nets.
SC180	Turks Head		Turk's Head Inn

Scilly vessels (Home island not presently known)

Regn. No.	Vessel	Skipper	Comments
PZ35	Karenza	K.M. Isles	
SC22	Penguin	Alan Hicks	
SC163	Kameruka	Matthew Honeychurch	
BM16	Stacey Anne		
CO171	St Gwenfaen		
E63	K2		
FR988	Boy Andrew		
PW461	Gwendra		
PZ734	Cynth		
SC1	Torri Bee		
SC21	Nazarene		
SC25	Northwood		
SC27	Isis		
SC50	Zephyr		
SC56	Hunter II		
SC60	Leonora		
SC73	Steren-mor		
SC80	Violet May		
SC84	Faith		
SC140	Angelus		
SS717	Boy Daniel		
PZ69	Emma Rose		Sold away
SC3	Coriana		Sold to Hayle
SC19	Forget-me-not		No longer fishing
SC66	Hustler		Gone
SC175	Marauder	Joel Bond/ Martin Bond	Trawler, Sold to Hartlepool, at end of 2009
SC178	Lowender		Now in Whitehaven

Non-Scilly vessels having "Historic rights" to fish in the Area (i.e. can fish between 3 and 6 miles from the baseline)

Regn. No.	Vessel	Skipper	Comments
AH32	Ajax		(Newlyn) No longer registered
FH664	Amethyst		(Falmouth)
PH58	Bruno of Sutton		(Bideford) ran aground in North Devon
PZ32	Cathryn		(Newlyn) No longer registered
BA45 Act	Charisma	John Walsh	(Padstow)
M8 Act	Danmark	Jeremy Jones	Small trawler (Newlyn)
PZ513	Excellent		(Newlyn) no longer registered
J86 (?)	Fleur de France		(Jersey) no longer registered
FH76	Galwad-Y-Mor		(Mevagissey)
PZ63	Golden Harvest		(Newlyn)
PW377	Guiding Light		(Looe)

BM51	Harm Johannes		(Brixham)
FY126	Heather Anne		(Mevagissey)
CN187 Act	Nova Spero	Shaun Edwards	(Newlyn)
SE34	Pen Glas		(Salcombe)
FY111	Red Vixen		(Mevagissey)
PZ75	William Harvey		(Newlyn)

Other boats fishing in the area (outside 6 miles limit)

Regn. No.	Vessel	Skipper	Comments
PZ110 Act	Imogen	Roger Nowell	Trawler, sold to Mevagissey in November 2010
KY202 Act	St Adrian II	Roger Nowell	Trawler, replaced Imogen in November 2010
FH508 Act	Britannia IV of Falmouth	Andrew Stevens	Netter
WY335 Act	Sardia Louise		Netter
FH750 Act	Myghal		Netter
BM35 Act	Shiralee	Peter Jane/Jeff Payne	Trawler
FY43 Act	Lenten Rose		Trawler, Mevagissey
PZ734			

D) Recording Forms

D.1) Fish and Shellfish Landings,

Fish and Shellfish Landings

Place of Landing **Date2009**

Time of visit.....

Species		Species	
Dover Sole		Blonde Ray	
Sand Sole		Thornback Ray	
Lemon Sole		Spotted Ray	
Plaice		Small-eyed Ray	
Flounder		Shagreen ray	
Dab		Undulate Ray	
Megrim		Cuckoo Ray	
Witch		Common Skate	
Turbot			
Brill			
		Lesser Spotted Dogfish	
Angler (Monkfish)		Bull Huss	
Red Mullet		Spurdog	
Hake		Tope	
Bass		Smooth Hound	
John Dory		Starry Smooth Hound	
Black Sea Bream		Porbeagle	
Sea Bream		Blue Shark	
Cod			
Pollack			
Coley (Saithe)			
Ling			
Pouting (Bib)		Edible Crab	
Haddock		Spiny Spider crab	
Whiting		Lobster	
Conger		Spiny lobster (Crawfish)	
		Shrimps	
Grey Mullet			
Tub Gurnard			
Red Gurnard		Eledone	
Grey Gurnard		Octopus	
		Squid	
Wrasse		Large squid	
		Cuttlefish	
Mackerel		Scallops	
Spratt		Queen Scallops	
Herring		Whelks	
Shad			
Pilchard			
Anchovy			
Horse Mackerel			

Comments

.....

D.2) Species Report Form



The Isles of Scilly Wildlife Trust

Isles of Scilly Marine Recording Scheme

FISH REPORT SHEET

Common Name			Date of Capture/Landing/Sighting
Scientific Name (if known)			
Length (cm)	Weight (kg)	Number	Sex
Description of Animal			
Specimen held: Y / N Photograph available: Y / N			
Identified by		Verified by	
Location		Grid Reference	Latitude & Longitude
		SV	N W
Tick box if you wish the location to remain confidential <input type="checkbox"/>			
Description of Area & Bottom Type		Depth (m)	Tidal State
Fisherman/ Angler / Vessel		Type of Fishing Gear	
<p>Additional comments incl. sea temperature, other animals caught, how identified etc.</p> <p>All records are useful even if incomplete. It may be possible to identify unknown animals from photographs. Information & positive identifications from sightings and fish returned to the sea are also helpful</p>			
Recorders Name :		Please return form as complete as possible to:	
Address :		ERCCIS	
Postcode :		Five Acres	
Telephone No :		Allet, Truro	
Email :		Cornwall	
		TR4 9DJ	
		Tel: 01872 240777	
		ercis@cornwt.org.uk	

DATA PROTECTION ACT: Information entered on this report sheet will be held on a computer database which may be shared within the National Biodiversity Network and with other similar organisations – please tick box if you wish the information to remain confidential .