

European Fisheries Fund 2007 – 2013

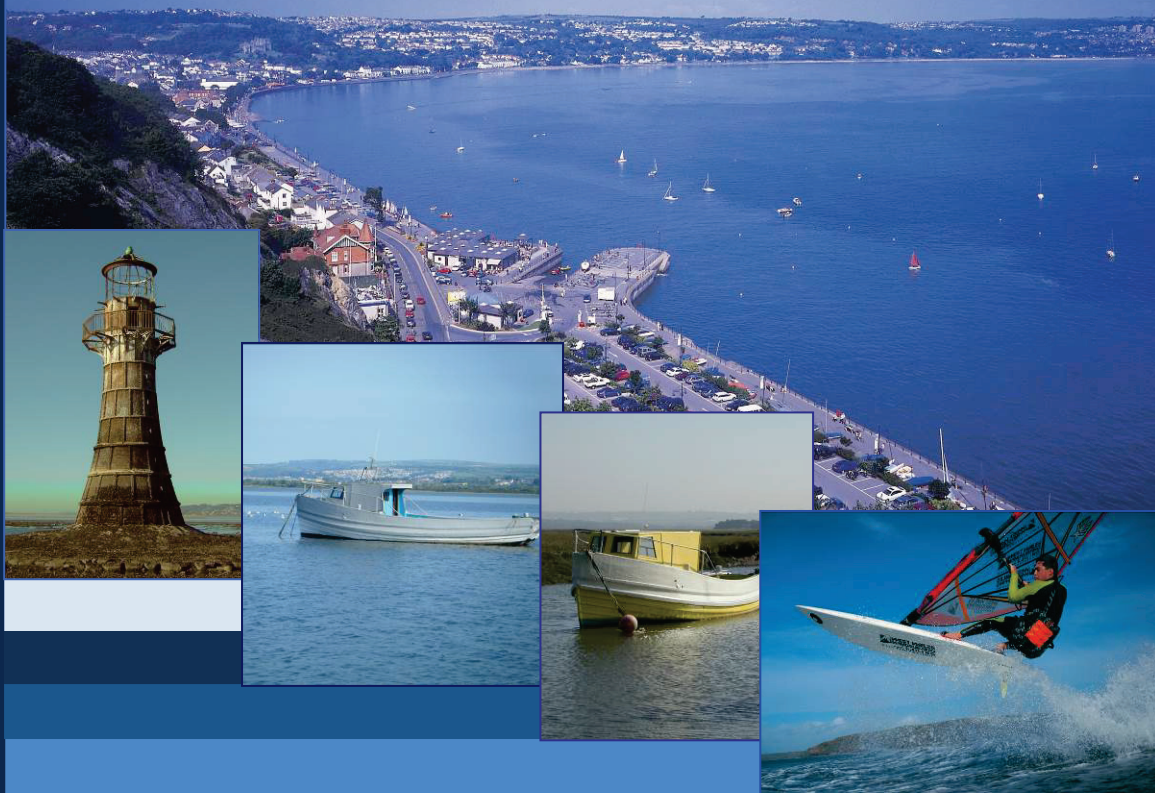
Axis 4 – Sustainable development of Fisheries areas

Swansea Bay Fisheries

Local Development Strategy

2012 - 2013

Swansea Bay Fishing Industry Research Study 2015



Y Gronfa Pysgodfeydd Ewropeaidd:
Buddsoddi mewn Pysgodfeydd Cynaliadwy
European Fisheries Fund:
Investing in Sustainable Fisheries



Llywodraeth Cymru
Welsh Government

Swansea Bay Fisheries Local Action Group

A DELIVERY TEAM OF THE SWANSEA RURAL DEVELOPMENT PARTNERSHIP

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SWANSEA BAY FISHING INDUSTRY RESEARCH STUDY



Report commissioned by:

Swansea Bay Fisheries Local Action Group

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Acronym list:

AC	Advisory Council
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CFP	Common Fisheries Policy
CFPO	Cornish Fish Producers Organisation
EFF	European Fisheries Fund
EMFF	European Maritime Fisheries Fund
ERDF	European Regional Development Fund
EU	European Union
FAO	Food and Agricultural Organisation of the UN
FIGF	Financial Instrument for Fisheries Guidance
FLAG	Fisheries Local Action Group
FTE	Full Time Equivalent
ICES	International Council for the Exploration of the Seas
IFCA	Inshore Fisheries and Conservation Authority (England)
LDS	Local Development Strategy
MCS	Marine Conservation Society
MMO	Marine Management Organisation
MSC	Marine Stewardship Council
PA	Port Authority / Harbour Master
PDO	Protected Designation of Origin
PGI	Protected Geographical Indicator of origin
PO	Producer Organisation
PTA	Plymouth Trawler Agents
RBS	Registration of Buyers and Sellers
SWBFLAG	Swansea Bay Fisheries Local Action Group
SWWFC	South & West Wales Fishing Communities Ltd
TAC	Total Allowable Catche
WFA	Welsh Fishermen's Association (WFA)
WG	Welsh Assembly Government (WAG)

Executive summary:

The Swansea Bay Fisheries Local Action Group (SBFLAG) was set up in April 2012 as a response to opportunities coming forward as part of Axis 4 of the European Fisheries Fund UK Operational Programme 2007-13. It covers a 70-mile stretch of coastline from the Loughor estuary (Burry inlet) in the west to Porthcawl in the east.

The Swansea Bay FLAG brings together local representatives from the public, private and third sectors to implement the Swansea Bay Fisheries Local Development Strategy (LDS). This strategy highlighted the lack of information available on the local fishing industry & related sectors and identified a need for further research in the following key areas:

- i. Socio-economic analysis of the local fisheries sector
- ii. Species and volumes of fish and shellfish harvested locally
- iii. Sustainability of local fish and shellfish resources
- iv. Market insight into supply chains for local fish and shellfish
- v. Understanding demand from wholesalers, processors and fishmongers for locally harvested fish and shellfish products.
- vi. Understanding the barriers to selling more fish locally
- vii. Identifying opportunities for expanding the local market drawing on best practice examples that have worked well in other locations.

This report addresses these information needs through a mix of rigorous desk-top research, stakeholder interview and detailed analysis. The key findings of this research are as follows:

i. Socio-economic analysis of the local fisheries sector

- The majority of businesses are based in and around Swansea. The estimated economic impact of fish related business activity in the FLAG area is approximately £4.65 million.
- In the 2011 census Swansea and its hinterland had 402 people employed in farming and fishing, around 140 of these jobs are believed to be fisheries dependent.
- Wales has the highest number of part time fishermen in the UK with 35% being part time. The average age of fishermen surveyed was 54; no fisherwomen were identified in the study area.

Table 1: Employment by sector

	Employment (PT & FT)
Commercial fishing	18
Fish mongers (retail)	28
Fish & shellfish processing	46
Angling shops	21
Mariculture	4
Charter boats & freshwater fisheries	22
Others	8
<u>Total</u>	147

- The ratio of fishing jobs to downstream supply chain businesses is 1:4 which is similar to that seen across other fishing areas in the UK.
- Key skills shortages were identified in fish filleting with there being no suitable training or apprenticeships to engage young people within the industry.
- The commercial fishing fleet of the Swansea Bay FLAG is made up of 34 of vessels consisting entirely of fishing vessels under 12 metres in length, with the average vessel length being 7.71m in length.
- In the last five years the fleet has contracted by 27%.

Table 2: Summary of fleet distribution and trends 2010 to 2015

	>10m in length		< 10m in length	
	2010	2015	2010	2015
Swansea	1	2	33	25
Porthcawl	0	0	5	2
Port Talbot	0	0	3	3
Oxwich Bay	0	0	3	3
Total	1	2	44	32

- The main port in the area is Swansea being the registered home port for 81% (26) of vessels in the fleet.

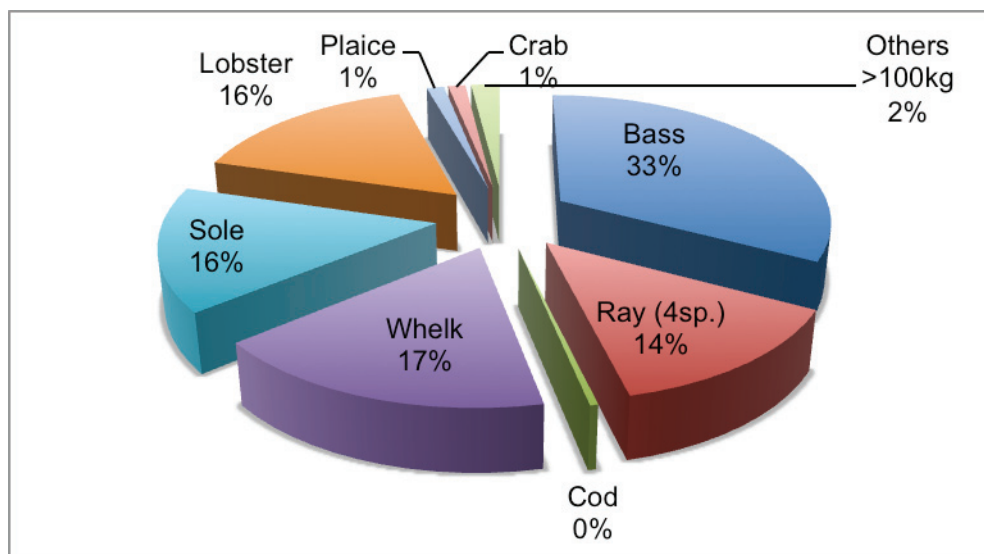
ii. Species and volumes of fish and shellfish harvested locally

- The Swansea Bay FLAG commercial fishing fleet landed 131 tonnes of fish and shellfish worth £284,901 in 2013, compared with 257 tonnes worth £393,013 in 2009, representing a 50% reduction in the tonnage and a 27% reduction in the value of landings over the last five years.
- Landings at Swansea account for 81% of the total weight and 75% of the total value of landings in the Swansea Bay FLAG area. Landings at Porthcawl make-up up 18% and 25% of the weight and value of landings respectively.
- In total 40 species of fish and shellfish are shown in the statistical records; however, of these the most frequently landed species account for 90% of the weight and 95% of the value of landings (see table below).

Table 3: Breakdown of landings (by catch and value) in 2009 vs 2013

Species	2009		2013		Tonnes	Value (£)
	Tonnes	Value (£)	Tonnes	Value (£)	% change	% change
Bass	12.3	75377	12.9	93044	+5	+23
Ray*	56.2	90714	28.5	38406	-49	-58
Cod	0.5	1220	0.4	1154	-24	-5
Whelk	163.2	103601	68.8	49321	-58	-52
Sole	2.9	26301	4.9	44024	+72	+67
Lobster	6.9	73281	4.2	45572	-39	-38
Plaice	4.3	8431	2.6	3437	-39	-59
Crab	2.4	3208	2.6	3403	+6	+6

Figure 1: Breakdown of total catch value by species



iii. Sustainability of local fish and shellfish resources

- Two of the six main fish / shellfish species produced in the area (plaice and sole) are analytically assessed by the International Council for the Exploration of the Seas (ICES) and are managed by Total Allowable Catches (TACs) identified agree at EU level.
- Four of the six key fish /shellfish stocks (plaice, sole, ray and cockle) are managed by a combination of fleet licensing and / or catch quotas.
- Emergency measures aimed at protecting bass stocks will be announced in the Summer of 2015.
- Evidence from research by Bangor University suggests the whelk fishery is at best fully exploited and could be at risk of over-exploitation.
- The cockle fishery in the Burry inlet has been a Marine Stewardship Council (MSC) certified fishery since 2001 [n.b. while this in itself does not guarantee sustainability of stock it gives an indication of how well a fishery is managed].

Table 4: Sustainability risk assessment of key local species

	Stock	Management	Environmental impact	Overall risk rating
Bass	Red	Orange	Green	Red
Ray	Orange	Orange	Orange	Orange
Whelk	Orange	Red	Green	Red
Plaice	Orange	Orange	Orange	Orange
Sole	Green	Orange	Orange	Orange
Cockles	Orange	Green	Green	Orange

iv. Market insight into supply chains for local fish and shellfish

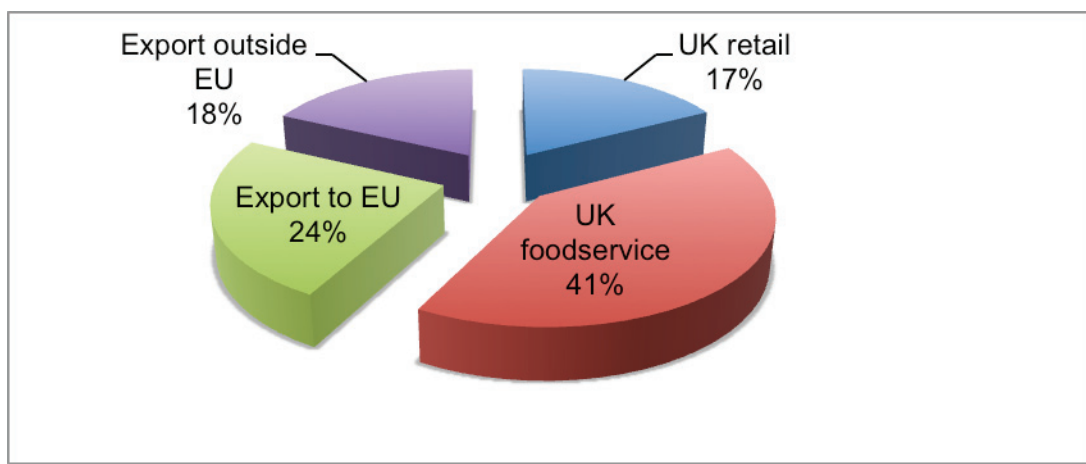
- The first sale (i.e. from the boat to the first buyer) of around 80-90% of the finfish landed in the SBFLAG area takes place outside the FLAG area, with the majority being sold at auction in Plymouth and smaller quantities either being sold to a small number of wholesalers to the West of Wales (Milford) or a wholesaler in North Devon.

- Fish sold at auction can be sold to any one of the 50 companies buying from the electronic auction on a daily basis. Some of these companies will supply retailers, some foodservice outlets while others specialise only in export and some will be a supply mixture of customers across all of those markets.

Table 5: estimated end market values (£) of finfish landed by Swansea Bay FLAG fleet

	UK		Export (EU)	Export (outside EU)
	Foodservice	Retail		
Bass	46522	46522	0	0
Whelk	0	0	0	49321
Ray	13442	13442	11522	0
Plaice	1031	1719	687	0
Sole	17610	4402	22012	0
Lobster	9114	4557	31900	0

Figure 2: Value of estimated end markets for local finfish landings



v. Developing an understanding of demand from wholesalers, processors and fishmongers for locally harvested fish and shellfish products.

- Demand for local fish and shellfish from local retailers and processors is low as these businesses recognise that they are largely dependent on importing fish and shellfish into the SBFLAG area, mostly from outside Wales.
- Demand for locally harvested fish and shellfish from restaurateurs was high although the scope for developing this area will be supply limited.

vi. Understanding the barriers to selling more fish locally

- Poor continuity of supply, typically low catch volumes, a low diversity of species landed and absent onshore infrastructure in all ports are significant barriers to selling more locally caught fish to retailers (locally and nationally) and processors (locally and nationally) supplying the foodservice sector.
- Consumer tastes and preferences (i.e. for cod, haddock, tuna, salmon and prawns) do not align well with the local seafood offering.
- Fish quality is compromised through a weak 'chill chain' from vessel to the first sale buyer; this could be improved through funded access to ice machines, quayside cold stores and insulated ice bins.

- Fishermen are time poor and generally believe the additional costs of developing local markets would outweigh the benefits, although a small number are not closed to the idea of exploring options in this area.
- Demand for certain species (e.g. cockles and whelks) from overseas is strong.

Opportunities for expanding the local market

- Opportunities to expand local retail markets for finfish species are limited.
- There maybe scope for piloting a 'Community Supported Fishery' (CSF) type scheme, where a co-ordinator provides the link between catcher and consumer.
- There was strong demand from restaurateurs for locally harvested fish and shellfish and it is recommended that any future market development interventions are focussed in this area.
- The marketing of locally grown mussels could be further developed with investment in branding and marketing built on local provenance and sustainability.
- Local awareness of the SBFLAG area fish and shellfish offering could be improved greatly through a co-ordinated and strategically positioned promotion and marketing programme.
- Events and activities building on the success of the Mumbles Oyster festival could further promote the region as a 'gastrotourism' destination in Wales
- Opportunities to further develop the scope of local aquaculture may arise if plans for the proposed tidal lagoon are passed.

Recommendations:

In order to capitalise on the some of the opportunities highlighted and to address some of the barriers raised the following recommendations are made for consideration as part of an action plan for the SBFLAG for the period 2016 -2020.

- Invest in additional capacity to provide cohesion, leadership and time in order to develop strategic 'headline' projects that fit within the LDS objectives; such projects could include:
 - Aquaculture development strategy (to build on FLAG funded projects supporting an oyster hatchery feasibility study and market development for the mussel fishery)
 - Work with Universities, Welsh Government, NGOs, fishermen, fisheries scientists and statutory nature conservation agencies to develop a commercial pilot of an ecologically sustainable razorfish fishery
 - Undertaking of career / training mapping with individual fishermen
 - Supply-chain networking between producers and restaurants
 - Promotion and marketing of Swansea Bay seafood through events and workshops linked to the Mumbles Oyster festival
- Develop a marketing and communication strategy to improve awareness of the FLAG within the wider fishing community and develop public facing materials and activities for the food sector and recreational angling sector.
- Invest in infrastructure and capital items (e.g. ice bins) as the need for items such as an ice plant and chiller to provide a chill chain to enhance the quality of local wetfish landings cannot be over stated. This is a fundamental precursor to any local branding or marketing initiatives.

- Expanding the FLAG membership and developing sub-groups to increase inclusion of outlying sectors and drive development in key areas such as pescatourism, charter angling and restaurateurs.

Work with academic institutions and fisheries managers to investigate ways of ensuring sustainable development of fisheries for under-utilised species prior to new fisheries being targeted.

1. Introduction

Axis 4 of the European Fisheries Fund (EFF) seeks to go beyond merely tackling the short-term effects of the economic, social and environmental consequences of the depletion of fish stocks. Its purpose is to enable fisheries communities to create new and sustainable sources of income and to improve their quality of life. It does this by empowering local people, those who best understand both the problems and the aspirations of fisheries communities, in particular by providing them with the tools and resources to develop and adapt solutions to meet their real needs.

In Wales four Fisheries Local Action Groups (FLAGs) were established (Ceredigion & Aberdyfi; Cleddau 2 Coast, Swansea Bay & the Mumbles and Gwynedd & Anglesey) in 2012 and allocated a total of £1.6m from EFF. The Local Development Strategies from each FLAG were accepted by Welsh Government (WG).

The Swansea Bay FLAG was set up in April 2012 as a response to opportunities coming forward as part of Axis 4 of the European Fisheries Fund UK Operational Programme 2007-13. The FLAG brought together local representatives from the public, private and third sectors to implement the Swansea Bay Fisheries Local Development Strategy (LDS). The LDS covers the geographical area from Loughor in the West to Porthcawl in the East, both coastal and inland fisheries, broadly within the City & County of Swansea, Neath Port Talbot and Bridgend local authority areas.

The SBFLAG has a strong Vision going forward:

'By 2020 we want to see successful, sustainable, economically viable local fishing and associated industries, aware of its heritage, and well equipped to meet current and future challenges.'

The LDS aimed to develop the Vision and Strategic Themes of *Swansea 2020* and its counterpart strategies in Neath Port Talbot and Bridgend as they relate to the local fishing industry and related sectors. The Strategy provided a timely opportunity to ensure synergy between the overall economic regeneration aims of the region, and the new opportunity to progress industry and community led economic regeneration in support of the fisheries industry.

The strategy identified four main themes which gave rise to eleven objectives as set out below:

Theme 1: Strengthening competitiveness of local fisheries

Objective 1: Achieving better links with schools and colleges to encourage young people to help develop the sector.

Objective 2: Development of opportunities for practical work experience or placements.

Objective 3: Provision of opportunities for networking and promotion for the local industry

Objective 4: Improvement of links with local food and other producers and local markets

Theme 2: Restructuring and redirection of economic activities

Objective 5: Support for local businesses needing to restructure

Objective 6: Development of opportunities to develop the tourism sector linked to local fisheries

Objective 7: Making the most of the natural environment

Theme 3: Diversification activities including creation of additional jobs outside the fisheries sector

Objective 8: Helping the local fishing industry needs to look at alternative sources of income

Objective 9: Sustainable and balanced development of the potential of the heritage and tourism aspects of the coastline

Objective 10: Provision of training to support the current and future workforce of the local fishing industry

Theme 4: Adding value to fisheries products

Objective 11: Provision of support for trying out new processes or adding value to products to help small companies in the fishing industry to grow

The Swansea Bay Fisheries LDS also highlighted the lack of information that is available on the local fishing industry & related sectors. In particular, it identified a need for further research to ascertain numbers of fishermen, landings and demand in Swansea Bay.

2. Background

The Swansea Bay FLAG covers a 70-mile stretch of coastline from the Loughor estuary (Burry Inlet) in the west to Porthcawl in the east. Within this area lies a diverse range of habitats from the exposed sandy beaches and rocky headlands of the Gower peninsula to the sub-tidal mudflats of the Burry Inlet.

The Gower peninsula is known for its coastline, popular with walkers and outdoor enthusiasts, especially surfers and sea anglers. The southern coast consists of a series of small, rocky or sandy bays, such as Llangland and Three Cliffs, and larger beaches such as Port Eynon, Rhossili and Oxwich Bay. The north of the peninsula has fewer beaches, and is home to the cockle-beds of Penclawdd.

Swansea Bay (and all of the upper reaches of the Bristol Channel) experiences one of the largest tidal ranges in the world with a maximum range of about 10m. This offers potential for electricity generation using tidal lagoons and such a proposal has been put forward by Tidal Lagoon Swansea Bay Ltd. The tidal lagoon would be sited just south of the Queen's Dock between River Tawe and River Neath estuaries. The shipping ports in Swansea Bay are Swansea Docks, Port Talbot Docks and Briton Ferry wharfs.

To the east is Port Talbot which is built along the eastern rim of Swansea Bay in a narrow strip of coastal plain surrounding the River Afan estuary. The north-eastern edge of the town is marked by the River Neath. A significant landmark in the town is the Port Talbot Steelworks.

Beyond Port Talbot to the far east of Swansea Bay lies the town of Porthcawl in the county borough of Bridgend. Situated on a low limestone headland on the South Wales coast, overlooking the Bristol Channel, Porthcawl developed as a coal port during the 19th century, but its trade was soon taken over by more rapidly developing ports such as Barry.

Figure 3 : map of Swansea Bay FLAG area



3. Project aim and objectives

The aim of the project was to provide a robust, comprehensive and wide-ranging evidence base to provide a firm foundation from which the SBFLAG can develop and deliver quality projects, providing long-lasting, sustainable benefits for the Swansea Bay fishing community.

Beneath this aim were a number of key objectives:

- i. To provide information and analysis on the number of businesses in the fishing industry & related sectors in Swansea Bay with a breakdown by size of businesses, location and activity.
- ii. To provide information on the numbers employed in the sector, broken down by full/part time, gender and age.
- iii. To undertake a desk-top assessment of fishing stocks and ecological sustainability of fishing and shellfish harvesting operations in the FLAG area.
- iv. To identify constraints on growth of the sector locally (be they infrastructure, skills shortage or lack of sector support).
- v. To provide information and analysis on the volume of fish landings in Swansea Bay, broken down by species of fish.
- vi. To provide insight into the destination and supply routes for fish landed in Swansea Bay, identifying (where possible) the customers for each type of fish and providing an understanding of how much fish is sold locally and how much is exported.
- vii. To assess the local demand for local fish products by building an understanding where local wholesalers, processors and fishmongers currently source fish and fish products.
- viii. To develop an understanding of what the barriers to selling more fish locally and to identify the opportunities for expanding the local market (e.g. linked to Swansea market), local produce events, tourism / hospitality trade events, drawing on best practice examples that have worked well in other locations.

4. Research methodology

The project was undertaken within the knowledge that information and data in many areas of the areas covered by the scope of works was either poor or non-existent. The approach therefore focussed on understanding the limitations of the existing secondary datasets and filling gaps in knowledge through the collection of primary data directly from stakeholders. The principle tool for this was via one-to-one interviewing individuals, businesses and organisations either face-to-face or over the telephone. Interview questions were a mix of open and closed questions to provide both quantitative and qualitative data. The one-to-one interview approach was supported by internet surveying where necessary.

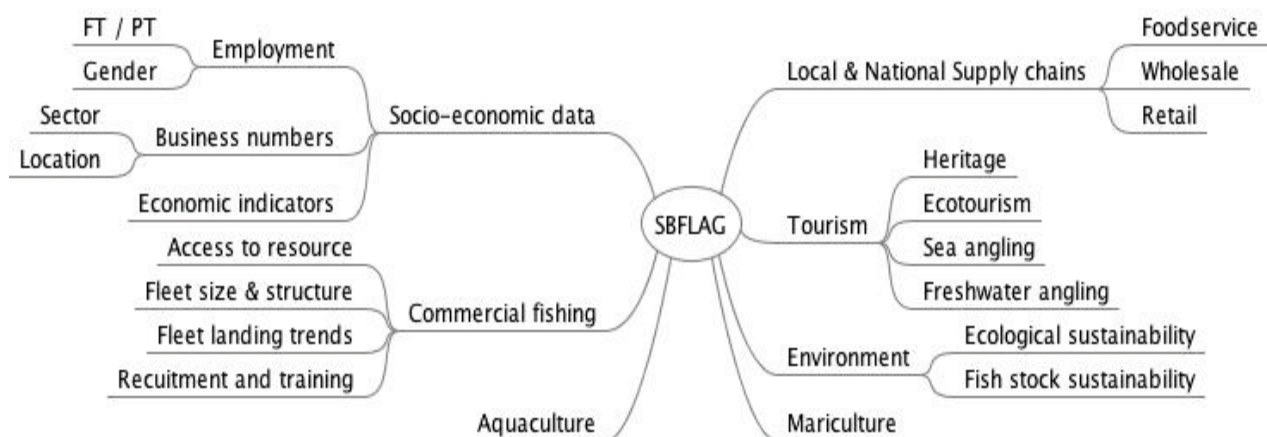
The project was broken down into four phases, as follows:

4.1 Undertaking a desk-top study to review existing data and to map stakeholders:

This involved:

- undertaking a 'mind-mapping' exercise to provide a visual tool to inform and guide the research to meet the project objectives (see figure 1 below);
- collating a wide range information and secondary data on fish landings, fish stock assessments, fleet/vessel data, socio-economic from a range of sources (Welsh Government, Marine Management Organisation (MMO), Seafish, DG Mare, census, International Council for the Exploration of the Seas (ICES) and Creditsafe data) to build a biological, technical and socio-economic profile of the study area to guide the visits, people/organisations/companies to be interviewed and development of questions to be covered during each interview;
- working with FLAG members, local council members, fishing community groups and an independent expert to identify key stakeholder groups;
- mapping the study objectives against available data (gathered at b)) and identifying knowledge gaps where these existed;
- developing interview questions for stakeholder interviews and surveys to obtain knowledge and information required to fill the knowledge gaps identified in d) (above);

Figure 4: Mindmap of project stakeholder groups and objectives:



4.2 Undertaking stakeholder interviews:

This involved:

- a) creating a database of contacts for all relevant stakeholders (individuals and organisations);
- b) embarking on a series of visits to identified stakeholders to conduct face-to-face interviews over a two-week period;
- c) undertaking supplementary telephone interviews made up of a mixture of open and closed questions;
- d) developing an internet survey to ascertain the demand for locally sourced seafood from local restaurants and hotels.

4.3 Analysis:

The results of desk research, stakeholder interviews and internet survey were analysed with the objective of informing strategy and, where possible, providing actionable insight in the areas:

- local fleet landings and fleet dynamics
- local fish supply chains with a view to adding value
- the sustainability of locally caught fish and shellfish stocks
- understand the markets
- understanding the economic opportunities across the sector
- making recommendations in keeping with the LDS objectives

4.4 Reporting:

As set out in the project tender document, the reporting of project research and findings consisted of:

- a) the submission of a draft final project report to FLAG members for comment, discussion and feedback;
- b) a presentation of key research findings, opportunities and barriers to the SBFLAG;
- c) delivery of a final report to the client group, highlighting key findings against the objectives and recommendations for next steps

5. Research findings

5.1 Breakdown of fishing related businesses

The FLAG area contains a complex network of businesses and with its good transport connections to the rest of the UK there is significant economic leakage. A number of businesses have multiple activities, developing businesses to meet local needs and demands. The majority of businesses are based in and around Swansea with less activity in the outlying parts of the area. The estimated economic impact of fish related business activity in the FLAG area is estimated at £4.635 million.

The survey of the sector has been achieved by using public research data such as on line directories, web searches by sector, the use of a commercial credit score database and phone calls to businesses. Most were willing to talk about staff numbers, the issues they face and trends. There was a reluctance to talk about turnover and profit. Company records at Companies House have been used to identify turnover for registered businesses.

5.1.1 Primary fish wholesalers and processors

Two primary wholesalers were identified as supplying an extensive variety of local, national and internationally sourced fish. These are medium size businesses with turnovers of £300-£700,000.

5.1.2 Secondary wholesalers and retailers

These have a wider distribution with 9 businesses being identified. The retailers ranged from well-established market stalls to small high street shops. The sector had two micro businesses employing one person to well-established traders with 8 staff. Turnovers ranged from small businesses at £20,000 to medium at £400,000.

5.1.3 Shellfish processors and merchants

9 businesses were identified within this sector. These include processors of cockles and crabs and one specialist mussel business. Turnovers ranged from 40,000 to over £500,000.

5.1.4 Service and support industry

5 businesses were identified within the FLAG area but were not studied in detail as were deemed as supporting the leisure boating sector.

5.1.5 Recreational Sport Angling (RSA) tackle supplies

Research found 6 businesses selling fishing tackle as the principle business were located, with the majority being Swansea based. All but one had seen falling demand especially among young people. Pressures of alternative leisure activities, growth of online games (Xboxes etc) have hit young demands and adults face many more challenges with leisure activity. The growth of football and rugby may have also hit demand. Businesses range from micro at £20,000 turnover to over £300,000. 47,000 rod licences were issued in 2012 to people in Wales.

Angling research showed that coarse fishing is the preferred type of angling for 59.4 per cent of anglers, as opposed to 25.6 per cent for game and 15 per cent for sea. A person goes fishing for an average of 58 days per year. Anglers spend an average of £500 to £1000 a year on their hobby.

5.1.6 Sea angling

5 boats have been identified which undertake charter and short fishing trips from Swansea and one wildlife 10 metre rib.

5.1.7 Freshwater Fishing

The area is well served by freshwater lakes with over 75 pegs available at Fendrod with ponds boating lakes and canal all available.

Salmon and Trout fishing numbers in Wales caught with rod and line are falling by 32% for salmon to 3221 catches in 2013 against 2012 and 15% down for sea trout to 12,354. No figures have been seen for the Tawe but the Environment Agency state that both Salmon and Sea Trout are at risk in the Tawe.

5.2 Employment

5.2 Overview

Through desk-top research 47 fisheries dependent businesses were identified within the FLAG area and were contacted for a short telephone interview. Almost all businesses contacted were happy to give their age and talk about the staff structure and challenges they faced.

In the 2011 census Swansea and its hinterland recorded 402 people employed in the farming and fishing sectors. Through interviews conducted during this study 140 people were identified as being directly employed with fishing and related added value products and services.

5.2.1 Commercial fishermen

Wales has the highest number of part time fishermen in the UK with 35% being part time. Of the sample spoken with the average age was 54, with no women fishers being identified in the workforce.

5.2.2 Primary fish wholesalers

18 people were employed in the two businesses sampled. The predominant age range was 40-50 with only one 18 year old. Only 2 females were identified as working in the sector. The average age was 45, with the oldest member of staff being 71. Full-time staff accounted for 95% of those employed in the sector. Key skills shortages were identified in filleting and it was there was no suitable training or apprenticeships to engage young people within the industry.

5.2.3 Secondary wholesalers and retailers

28 employers were identified as employed across 9 retail premises in the SBFLAG area. Employee ages ranged from 18 to 81 with 14% of the staff being women. 10% of employees were classified as part-time workers.

5.2.4 Shellfish processors and merchants

26 people were identified as employed within 9 businesses. 25% of the sector workforce staff were women with an average age of 48. There were significantly more people involved in the collection of produce before sale to the processors and merchants.

5.2.5 Angling supplies

Research showed that 10% of employees within the sector were female and 90% of all posts were full time jobs. Employees' ages ranged from 16 to 71. A total of 25 people were employed in the sector, with an average age of 47yrs.

A significant challenge reported by employers was the lack of appropriate training and support for young entrants. It was reported that many school leavers failed in their trial period with a lack of customer skills or willingness to engage with customers.

5.2.6 Charter boat fishing / Pescatourism

The 5 strong charter boat sector had an average crew age of 44. Most employment in the sector is skipper / owners.

5.2.7 Freshwater Fishing

Under 10 jobs were identified as being directly employed within the sector with most being self employed or volunteer positions.

Table 6: Summary of employment by sector

	Employment (PT & FT)
Commercial fishing	18
Fish mongers (retail)	28
Fish & shellfish processing	46
Angling shops	21
Mariculture	4
Charter boats & freshwater fisheries	22
Others	8
Total	147

5.3 Commercial fishing fleet

5.3.1 Fleet size & distribution

The commercial fishing fleet of the Swansea Bay FLAG is made up of 34 vessels consisting entirely of fishing vessels under 12 metres in length, with the average vessel length being 7.71m in length. This factor limits both the operational range and the sea conditions in which the vessels can safely operate and together this effectively limits the overall annual fishing effort (days at sea) and annual catches of the fleet (see section 5.5 below).

In the last five years the fleet has contracted by 27% and in recent months at least one other vessel has been sold from the area. The main port in the area is Swansea being the registered home port for 81% (26) of vessels in the fleet.

The average age of vessel in the fleet has decreased over the last five years from 25 to 18, which could indicate a common pattern of fleet modernisation alongside fleet rationalisation.

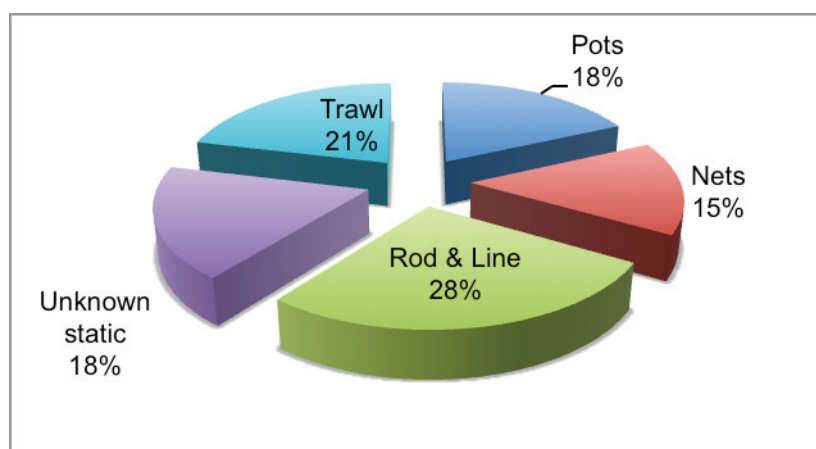
Table 7: Summary of fleet distribution and trends 2010 to 2015

	>10m in length		< 10m in length	
	2010	2015	2010	2015
Swansea	1	2	33	25
Porthcawl	0	0	5	2
Port Talbot	0	0	3	3
Oxwich Bay	0	0	3	3
Total	1	2	44	32

5.3.2 Vessel / gear types

The fleet is predominantly made up of static gear vessels (i.e. those fishing with nets, pots or rods) although the six mobile gear vessels (i.e. trawlers) contribute the majority of non-shellfish landings.

Figure 5: Breakdown of Swansea FLAG fleet by principle gear type



The static gear fleet is split between potters, netters and rod and line boats. The target species for the potters are whelks and lobster, with very little crab being seen in the area. The target species for the netting vessels varies seasonally with cod being a principle target in the winter months and ray, sole and bass being target species in the summer. These vessels can fish grounds up to 20 miles offshore, subject to

favourable weather conditions and use a mixture of single wall mono and multi-wall (ie. trammel nets). The rod and line fishing is almost exclusively for bass.

The local mobile gear fleet (trawlers) prosecutes a demersal mixed fishery in which sole, plaice and ray are the principle target species using single-rig trawls and traditional trawl gear.

One vessel is rigged with a hydraulic dredge to catch razorfish but has been unable to prosecute the local razorfish stocks since the introduction of a ban on this method of fishing in Welsh waters several years ago.

5.3.3 Quota management

For quota management purposes one vessel is a member of a Fish Producers Organisation (FPO) the rest are managed directly by Welsh Government. A report commissioned by Welsh Government in 2012 reported that >80% of Welsh inshore (under 10m) quota was landed by vessels fishing from Swansea and Porthcawl.

5.3.4 Numbers of fishermen

Although reliable published data was unavailable, stakeholder intelligence suggested there were currently eighteen full-time fishermen in the FLAG area (see table 6). Part-time fishermen ranged from fishermen nearing retirement, to occasional commercial bass anglers and other seasonal fishermen who fished full time during the Summer but relied on other paid work during the Winter months.

Table 7: Numbers of part-time and full-time fishermen by port

	Full-time	Part-time
Swansea	13	12-15
Porthcawl	2	2-4
Port Talbot	0	2-4
Oxwich Bay	3	0
Total	18	16-23

5.3.5 Crewing and age of fishermen

The majority of vessels in the fleet operate single-handed. There was no official data on the ages of fishermen and although the questions of age was no directly asked at interview it was apparent that the age structure of the fishermen was heavily skewed to those likely to be over 50yrs of age. One younger fishermen, crewing on a vessel, was interviewed and found to be from outside the area.

5.3.6 Industry views on fisheries management issues

- i) Discard ban – there was concern from fishermen targeting quota species over the possible implications of the landings obligation (or discard ban) due to be implemented for demersal species in January 2016.
- ii) Quota management – most fishermen felt that the small quotas available to them was greatly restricting their ability to make a living.
- iii) Local fixed netting byelaw – this governed the amount of nets a vessel could use in a tier, fleet or string (terms given to a number of nets joined together) and effectively required vessels to carry more anchors and ropes raising potential safety implications.

iv) Access to inshore grounds by non-Welsh vessels – there was considerable hostility towards trawlers from North Devon that had gained access to Welsh inshore waters.

v) EU bass management measures – there was concern about the recently announced package of bass management measures from the EU.

5.3.7 Industry science collaborations

Vessels in the FLAG area had collaborated with scientists on a number of industry-science partnership projects. Most recently this had involved work with Bangor University to study the local whelk fishery with a view to providing better information with which to manage the fishery. Welsh Government had also placed scientific observers on vessels to study gear selectivity, discards and survival rates in order to inform the Welsh Government's implementation of the landings obligation.

5.3.8 Awareness of FLAG strategy

There was generally a low awareness of the FLAG strategy and the opportunities it presented, although there was limited interest in diversifying into 'pescatourism' and developing local direct selling supply chains. Both are explored later under analysis provided at section 6.

5.4 Commercial fleet landings

The Swansea Bay FLAG commercial fishing fleet landed 131 tonnes of fish and shellfish worth £284,901 in 2013, compared with 257 tonnes worth £393,013 in 2009. This represents a 50% reduction in the tonnage and a 27% reduction in the value of landings over the last five years. Much of the reduction can be attributed to a reduction in whelk landings of 94 tonnes and ray landings of 28 tonnes.

5.4.1 Species landed

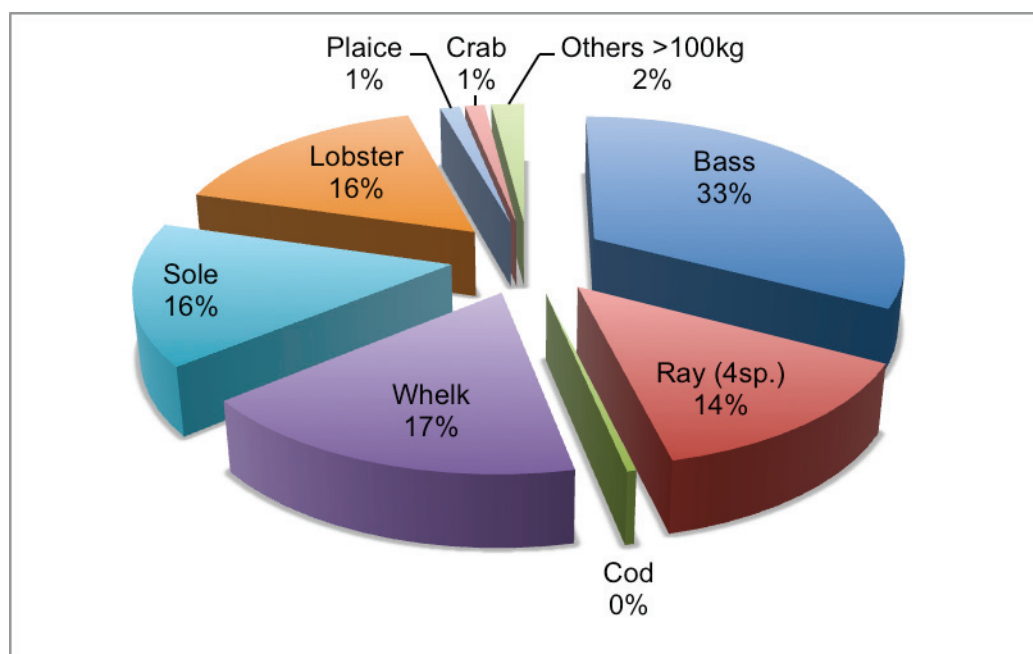
In total 40 species of fish and shellfish are shown in the statistical records; however, of these the most frequently landed species account for 90% of the weight and 95% of the value of landings (see table below).

Table 8: Comparison of values and volumes of landings 2009 vs 2013

Species	2009		2013		Tonnes	Value (£)
	Tonnes	Value (£)	Tonnes	Value (£)		
Bass	12.3	75377	12.9	93044	+5	+23
Ray*	56.2	90714	28.5	38406	-49	-58
Cod	0.5	1220	0.4	1154	-24	-5
Whelk	163.2	103601	68.8	49321	-58	-52
Sole	2.9	26301	4.9	44024	+72	+67
Lobster	6.9	73281	4.2	45572	-39	-38
Plaice	4.3	8431	2.6	3437	-39	-59
Crab	2.4	3208	2.6	3403	+6	+6

* = Ray landings made up of all species (i.e. thornback ray, small-eyed ray, blonde ray, spotted ray,

Figure 6: Breakdown of main species landed by value (£)



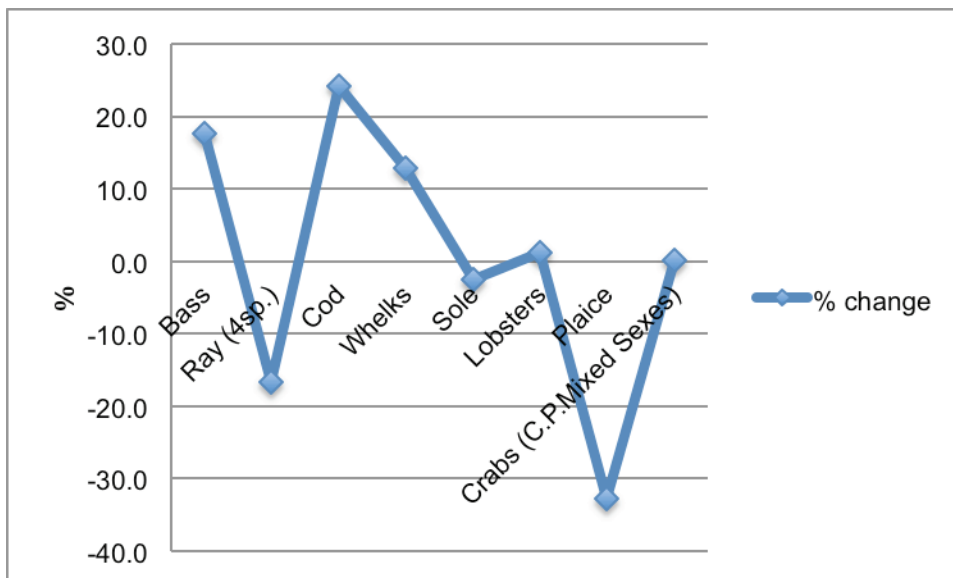
5.4.2 Landing ports:

Landings at Swansea account for 81% of the total weight and 75% of the total value of landings in the Swansea Bay FLAG area. Landings at Porthcawl make-up up 18% and 25% of the weight and value of landings respectively. The landing figures for Oxwich Bay are not shown separately within the landings stats provided by the MMO and are included in the Swansea dataset. No official landings are shown for Port Talbot.

5.4.3 Average prices (£ / tonne)

The change in average price (in £ per tonne) of the main landed species is shown below (figure 7). The graph shows a significant increase in the price of bass, which increased by 18% between 2009 and 2013 and a marked decrease in the price of plaice, which decreased by 33% and ray, which decreased by 17% over the same period. These changes could be as a result of changes in the relative abundance of different sizes in the landings. For example, larger bass generally command a higher price than small bass so an increase in the numbers of larger fish landed could skew the average value per tonne. The same would generally be true for plaice so here it could be that a greater proportion of smaller (lower value) plaice were landed, bringing the average price down. The decrease in the value of ray landed could be for similar reasons but more likely to be due to a general weakening in demand for ray following continued concerns being expressed by environmental non-governmental organisations (eNGOs) over the sustainability of ray

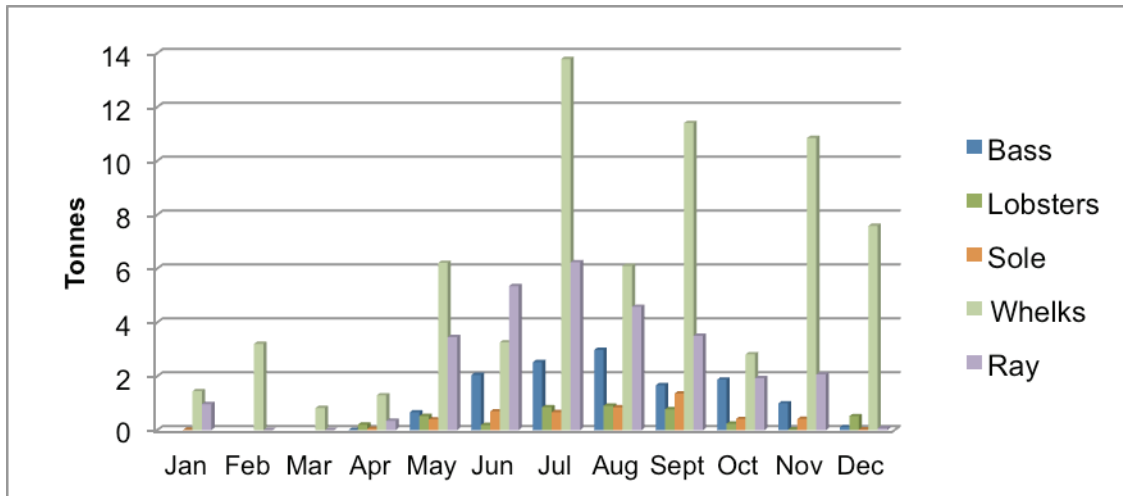
Figure 7: Graph showing % variation in price from 2009 to 2013



5.4.4 Seasonality

Commercial fish landings are seasonal with 90% of landings being made within the six months from June to October.

Figure 8: Chart showing seasonality of landings for main commercial species landed in Swansea Bay commercial fisheries



5.4.5 Landing site infrastructure:

Both Swansea and Porthcawl are poorly equipped in respect of basic infrastructure to fishing support the commercial fishing sector, particularly to those vessels targeting finfish or wetfish. These fish have a limited ‘shelf-life’ as microbial build-up leads to product deterioration as soon as the fish is pulled from the sea and onto the boat. After prompt gutting and washing the most critical factor in determining (and maximizing) shelf-life is the ability to keep the fish in a temperature controlled environment, either through the application of ice or storage in a refrigerated space. In larger fishing vessels this would be in a chilled fish hold but for smaller vessels such as those in the Swansea FLAG area many do not have below deck fish holds. For these vessels the recommended means of keeping catches in a temperature controlled environment is through the use of insulated bins and ice. Through Seafish studies these have been proven to maximize the quality and hence ‘shelf-life’ and value of fish, for up to 15 days (see figure 9 below).

The use of ice to keep catches in the best condition possible is also a cornerstone of the ‘caring for your catch’ element of the revised Seafish Responsible Fishing Scheme (RFS).

Figure 9: Seafish infographic showing the effect of rapid chilling on fish quality



Currently there are no communal, quayside ice facilities or cold rooms in any of the Swansea FLAG ports meaning that fishermen either have their own small ice plants at home or buy ice at a premium from a local fish processor. Neither solution is ideal as when in short supply ice tends to be used too sparingly to be totally effective.

5.4.6 Cold storage (catches, bait & discards)

The lack of quayside cold storage means that fishermen must store catches or bait in their vans which is not ideal during summer temperatures. A FLAG funded project to improve these facilities at Swansea was underway during the study and upon completion would go some way to addressing the concerns raised.

5.4.7 Safe loading and un-loading

The use of insulated fish bins for carrying ice and fish brings with it challenges with respect to the safe loading and un-loading bins from the vessel to the quay. Therefore, the installation of small landing davit type cranes should be investigated.

5.4.8 Shellfish harvesting

a) Cockles

Cockles are a shellfish that can be found in the muddy flats of the Burry Estuary, which lies between the Gower Peninsular and the County of Carmarthenshire. The cockles are gathered by the traditional method of hand rake and by riddle. Access onto the mud flats is now though by four wheel drive vehicle as opposed to donkey in centuries gone by. To commercially gather cockles from the estuary a valid permit is required. These are issued annually according to track record in previous years. The number of permits issued is managed in line with the cockle stock assessment. Once the cockles have been gathered they are taken to one of three local factories for onward sale or processed (see section 5.5.7 below).

Figure 10: Cockle beds at Burry Inlet



b) Mussels

There is one commercial mussel growing operation within the SBFLAG area which uses the sheltered, tidally flushed waters of Swansea docks to grow mussels using the 'rope' growing technique. The mussels growing cycle begins when wild mussel spat settles on the vertically suspended ropes in the springtime, growing naturally to market size over a period of 24 to 30 months. Floated headropes are horizontally strung out across the surface in the site area from which a large number of weighted dropper lines, 1cm thick and 10m long are attached. In spite of the impressive scale of the operation, there is little to see from the surface.

Figure 11: Rope growing mussel operation in Swansea docks (image credit :Thomas shellfish)

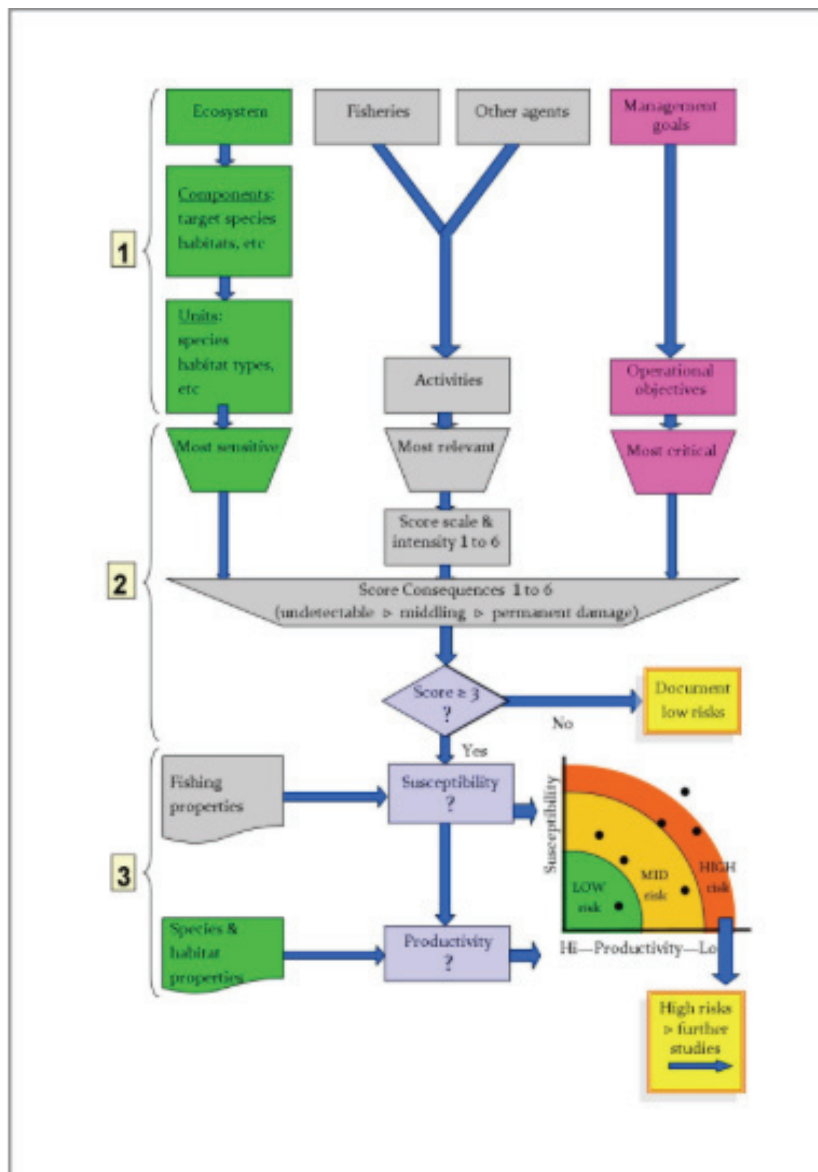


5.5 Fish stocks and ecological sustainability

As set out in the methodology the ecological sustainability of the main fish and shellfish stocks targeted has been assessed through the application of a risk-based approach to fisheries management supported by data from a range of sources including referenced scientific research and independent seafood ratings and risk (including ICES advice, Seafish RASS profiles, Marine Stewardship Council project inshore reports, Marine Conservation Society 'fishonline' tool, Cefas project reports and un-published reports provided by Bangor University MSc students).

The risk-scoring approach is underpinned by fisheries scale, intensity and consequence analysis (SICA). It provides a high level scoping tool and is well suited to data poor fisheries where judgments are based on the best data and science available. The approach is not designed to replace empirical stock assessments and the risk assessments provided in the report were done so at macro (stock area) level as a guide to FLAG members and should not be cited as academic research as that was not within the scope of the project objectives

Figure 12: Outline methodology flowchart for sustainability risk assessments



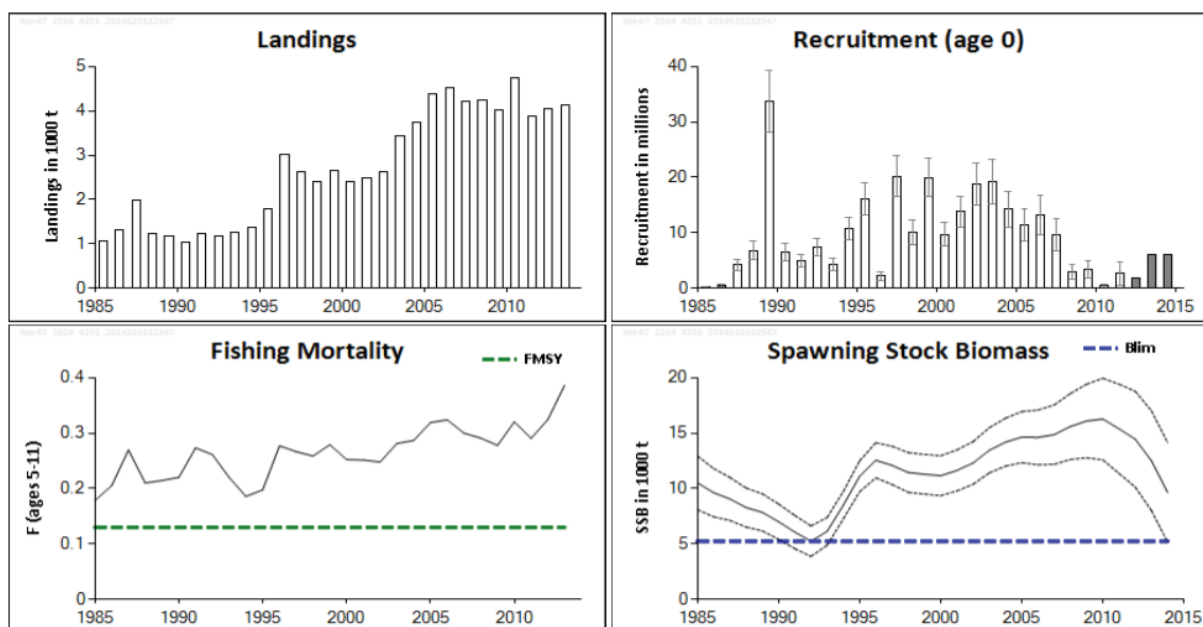
5.5.1 Bass

i) Introduction – in terms of the value of landings bass are the most significant ‘finfish’ species landed in the Swansea Bay FLAG area, accounting for 14% of the total landed value in 2013. It is also the most significant fish species to recreational shore anglers, many who travel from outside of the FLAG area to fish the open beaches and rocky headlands of the Gower peninsula for this the most prized of sport fishes.

The majority of the annual landings are made during the summer months. Sea bass grow slowly, do not mature until 4–7 years of age and have been recorded up to 28 years of age. Juvenile bass up to three years of age occupy nursery areas in estuaries whilst adults undertake seasonal migrations from inshore habitats to offshore spawning sites where they are targeted by pelagic trawlers. After spawning, sea bass tend to return to the same coastal sites each year. The combination of slow growth, late maturity, spawning aggregation, and strong site fidelity increases the vulnerability of sea bass to overexploitation and localized depletion.

ii) Stock – Strong year classes in 1989 and some subsequent years caused a rapid increase in biomass throughout the stock area, and landings and fishing mortality in the commercial fishery also increased.

Figure 13: Bass stock assessment data (graphs taken from ICES advice 2015)



The combined commercial and recreational fishery mortality is well above the level required to achieve Maximum Sustainable Yield (MSY). Recruitment has been declining since the mid-2000s, and has been very poor since 2008. The combination of declining recruitment and increasing mortality has caused a rapid decline in biomass.

The graphs above underline ICES cause for concern about over exploitation of the stock, with landings and fishing mortality (proportion of population taken each year by fishing) increasing against reducing recruitment and falling spawning stock size.

iii) Ecological interactions between fishing gear and marine environment – the main gear types for targeting bass in the area are rod and line, bottom fixed gill-netting and drift-netting. These methods are widely thought to have negligible impact on seabed

features and habitats. Rod and line fishing is thought to be highly sustainable as is relatively species specific and any juvenile / undersized fish can usually be returned to the sea alive. Globally, there are concerns that 'ghost netting' (by abandoned or lost gear) gill-nets are responsible for the deaths of a range of Endangered Threatened or Protected (ETP) species such as seals, cetaceans and seabirds.

iv) Management – all commercial vessels fishing for profit are required to be registered at the Registry of Shipping and Seamen (RSS) in Cardiff and have a fishing licence administered by the Welsh Government. The number of licences is capped so in effect the fishing effort is limited; however, there is significant 'latent capacity' within the UK under 10 metre fishing fleet and so it is possible for other licensed vessels to move into a fishery that appears more profitable. In England, Defra are considering consultation responses to a range of proposals to deal with latent capacity which is seen as a considerable risk by managers of English inshore fisheries.

vi) Summary – from a EU wide perspective the stock is clearly under pressure and in decline across its wide distribution. Given the limited scale and intensity of bass fishing by the Swansea Bay fleet (accounting for 0.3% of EU bass landings in 2013) it is un-likely that this decline has been brought about by local fishing activities. However, the EU is committed to implementing a bass management plan aimed at rebuilding stocks before the end of 2015. Management measures include an increased minimum landing size (42cm), a catch limit (quota) and a three fish per day 'bag limit' on recreational anglers and therefore are likely to have a significant impact on the commercial fishing fleet and recreational sea angling community in the FLAG area.

5.5.2 Whelks

i) Introduction – the whelk is a significant species for the Swansea Bay fleet, accounting for 17% of the value of landings in 2013. Over the past two decades the whelk fisheries of the South Wales coast have become an increasingly valuable alternative source of income for some fishermen, especially during winter when the other fisheries yield less. In recent years, some fishermen have become more reliant on the whelk resulting in an increase in the level of fishing effort on the whelk stocks. Aspects of whelk biology make the species potentially susceptible to both growth- and recruitment-overfishing, and the perceived increase in fishing effort has led to concern about the sustainability of the fisheries. This concern led the industry, via the Bangor University fisheries unit to propose that an investigation be undertaken as part of the EFF funded 'Sustainable Fisheries Resources in Welsh Waters project aimed to determine the population parameters of the whelk (*Buccinum undatum*) in Oxwich Bay and Swansea Bay, South Wales, as the distribution, abundance and movement of the species in Welsh waters was unknown.

ii) Stock – locally stocks have fallen dramatically over the last 5-years but it is unclear whether this is due to reducing stock abundance on local grounds or market forces leading to reduced demand. There is no formal stock assessment of whelks but this reduction in landings in the Swansea Bay area raised concerns about the sustainability of the stock. In the absence of stock assessment or previous research Catch Per Unit Effort (CPUE) was used as an indicator of stock abundance and found that fishing pressure in South Wales may be greater than for North Wales. In addition, the whelk populations in Oxwich Bay and Swansea Bay may be showing some signs of fishing pressure affecting the size range and abundance, relative to less exploited fisheries in the UK, which is particularly the case for Swansea Bay.

iii) Ecological interactions between fishing gear and marine environment – the only gear type is pots, typically these are made from five gallon plastic cans. The pots

themselves and the backropes joining them together are thought to have minimal (often negligible) impact on the seabed. No issues of by-catch of ETP species are reported although concerns have been expressed elsewhere (outside of the study area) over the use of edible crab bodies as bait in whelk fisheries. The potential increase in landings of commercially un-marketable fish under the landings obligation may provide an opportunity as bait the potting sector.

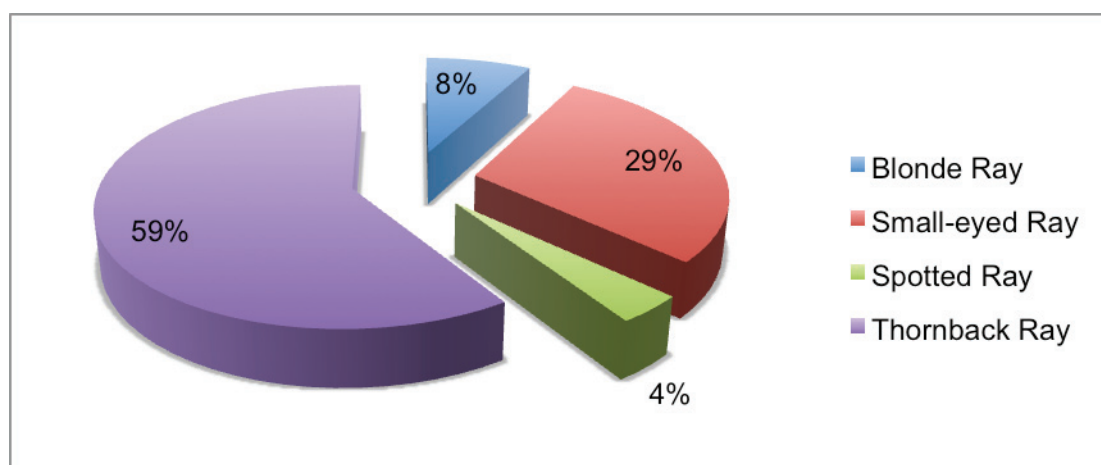
iv) Management – as with many whelk fisheries around Wales and the rest of the UK the whelk fishery is managed by vessel licensing and a minimum landing size (MLS) on the size of whelk (currently 45mm) that can be legally retained and landed. However, enforcement of the 45mm MLS is known to be limited. As with other fisheries there is latent capacity in the licensing of the under 10m fleet (as described above) and so this does not currently represent a real cap on fishing capacity in the fishery. There is no limit in place on pot numbers and no restriction (or quota) on retained catches so effectively fishing effort is not managed.

v) Summary – the whelk is a vitally important commercial species to the Swansea Bay fleet and therefore gaining a detailed understanding of the local stock status is essential is essential to inform management measures which can safeguard the stock in a sustainable fashion. Evidence available at this juncture is limited but does seem to suggest that the stock has been overfished and management measures maybe required in future to manage the risk to this fishery.

5.5.3 Ray

i) Introduction – four different species of ray are landed commercially by vessels in the SBFLAG area with thornback and small-eyed ray being the most significant (see Fig XX below). Rays are one of the main finfish target fisheries, being the most valuable finfish landed in 2009, though dropping to rank three by 2013. The reasons for the 49% reduction in landings is un-clear and should not automatically be assumed to be as a result overfishing, as market demand (and hence price), availability of other species and fleet contraction could all also be contributory factors.

Figure 14: Breakdown of SBFLAG fleet ray landings (2013) by species



ii) Stock

ICES usually provides advice on the overall exploitation (landings and discards) of the ray and skates species assemblage as well as on several individual species, but at

present does not advise that individual TACs be established for each species. This is because the catch statistics for individual species are not reliable. Current assessments use survey catch rates and landings figures as the main indicators of evolution of stock status. Advice provided by the ICES skates and rays working group in 2014 (for 2015/16) suggested that fishing pressure on thornback rays in the Bristol Channel had reduced and that the stock size was on the increase. It was noted that two projects undertaking stock assessments at a more regional level were due to commence later in 2015.

Figure 15: Summary table of biennial ICES advice for ray in 2015/16

Species	Stock Unit	2015/2016 % change landings	Advice (t)	Assessment level	PA buffer applied	Fishing pressure	Stock size
Thornback ray	VI	↑20	205	3.2	x	?	↗
Thornback ray	VIIa,f,g	↑20	1235	3.2	x	✓	↗
Thornback ray	VIIe	↔	260	5.2	x	?	→
Blonde ray	VIIa,f,g	↓20	897	5.2	✓	✗	?
Blonde ray	VIIe	↓20	310	5.2	✓	?	?
Cuckoo ray	VI, VII, VIIIab	↓34	1998	3.2	✓	✗	↘
Small-eyed ray	VIIIf,g	↓36	188	3.2	✓	?	↘
Small-eyed ray	VIIId,e	↓20	43	5.2	✓	?	?
Spotted ray	VI, VIIb,j	↓11	53	3.2	✓	?	↗
Spotted ray	VIIa, e-h	↓4	1118	3.2	✓	✗	↗

source: Seafish / ICES / Cefas

iii) Ecological interactions between fishing gear and marine environment

Ray are caught either in bottom towed trawls or fixed, bottom tangle-nets. The local trawl fleet consists of relatively low powered, low tonnage vessels and therefore the size and type of gear used will be relatively light compared to vessels from other member states (i.e. England, Belgium and France) which have access to waters upto six nautical miles of the Welsh coast. Ray are caught extensively on sandy or muddy seabed types in relatively shallow waters where the impact of these gears has been demonstrated (by scientific research) to be on a similar level to that resulting from natural disturbance caused by winter storms.

The bottom set tangle nets are made of monofilament netting and have a mesh size of between 220 and 250mm making them highly size selective and catching minimal by-catch of other species. Nets are 8 meshes deep and so have a very low lift of around 1 metre and therefore un-likely to interact negatively with marine mammals or diving seabirds. During the summer of 2014 Welsh Government funded sea trials to assess the survivability of ray caught in commercial gears but the results have yet to be published. Similar recent studies off the coast of North Devon have shown that immediate survivability is in the region of 60% although no attempt has been made to assess survivability after several days. Future ray tagging work funded by the North Devon FLAG may shed further light on this subject.

iv) Management

As a result of increased pressure from environmental NGOs the EU introduced a combined multi-species TAC to protect ray stocks in 2009. Currently, the scientific advice available for individual species of ray in the Bristol Channel sea area is not robust enough to allow TACs to be set at individual species level. This approach is of detriment to the SBFLAG fleet as stocks of thornback ray (the most important commercial ray species in the area) are thought to be on the increase. Within the UK the management of the ray quota by devolved administrations has been contentious issue as the quota was mis-managed in 2014 leading to a total UK-wide closure of the fishery early in October. Many inshore fishermen depend on ray fishing at that time of year and therefore to avoid a repeat of that situation in 2015 management of the quota will be on a more precautionary basis which could in turn be more restrictive of catches during the summer months. As rays are managed by a TAC they will also be subject to the landing obligation, although given the large physical size of rays relative to commercially targeted teleost fish caught it is likely that some form of exemption will be sought.

v) Summary

Ray is a crucially important group of species for the SBFLAG fleet. Due to a combination of slow growth rates and low fecundity (i.e. they produce very low number of eggs) they are particularly susceptible to over fishing. Lobbying by eNGOs over the past ten years has brought far greater scrutiny and focus on ray management at EU level, resulting in a catch quota being applied for the last six years. While ray landings in the area significantly reduced (by 49%) from 2009 to 2013 the ICES assessment suggests that stocks of the most commonly landed thornback ray are on the increase. With severe restrictions on bass fishing expected to be announced by the EU later in 2015 great care should be taken by fisheries managers to ensure that additional fishing pressure is not displaced on to local ray stocks.

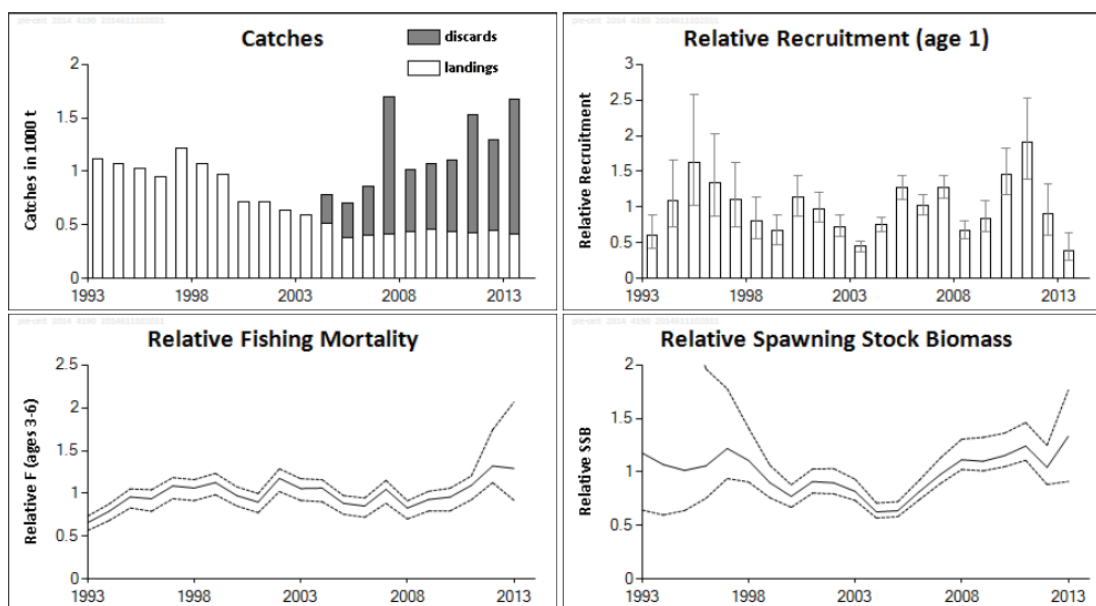
5.5.4 Plaice

i) Introduction – plaice are caught as part of a mixed fishery by demersal trawlers and as by-catch by netters targeting sole in the Swansea FLAG area. Plaice is a relatively low value species with local landings accounting for only 1% of the total value of fish and shellfish landed in the FLAG area. Landings have decreased by 39% since 2009 but this believed to be due to a highly restrictive quota limiting catches (leading to discarding) and not a reflection of its relative abundance in catches.

ii) Stock - the plaice caught by the Swansea Bay fleet are from an ICES-assessed stock from sea area VII f,g which encompasses a sea area from Lands End in the South to St David's Head in the North, being bordered by the Irish coast to the West and the North Cornish, Devon and Somerset coasts to the east. This stock has been assessed for over thirty years and the ICES assessment is therefore seen as a reliable indicator of stock health.

The ICES graphs (below) indicate that recruitment is variable in recent years and that both fishing mortality and the spawning stock size (biomass) is on the increase. Catches show that as the strong 2011 year class starts to appear in the fishery the amount of catch discarded exceeded that which was landed.

Figure 16: Plaice stock assessment graphs (taken from ICES advice 2015)



iii) Ecological interactions between fishing gear and marine environment - the local trawl fleet consists of relatively low powered, low tonnage vessels and therefore the size and type of gear used will be relatively light compared to vessels from other member states (i.e. England, Belgium and France) which have access to within six nautical miles of the Welsh coast. Plaice are known to live on sandy or muddy seabed types and so the impact of these gears on these relatively shallow water, mobile seabed types is believed to be negligible.

The bottom set sole and plaice gill-nets have a very low lift of around 1 metre and therefore assumed minimal by-catch of marine mammals or diving seabirds. A study was undertaken by Cefas in the autumn of 2014 into the survivability of plaice caught by a commercial fishing vessel from Swansea but the results have yet to be published. However, the results are thought to suggest that survivability was > 80%.

Discarding of plaice is known to be high in most towed gear fisheries where that are encountered and through previous Welsh Government work with Swansea fishermen it is known that the Swansea trawlers are no exception. Although absolute empirical data is un-available on plaice discards in local trawlers anecdotal evidence (pers comms) suggests it can be between 50-70% in certain areas and at certain times of the year.

iv) Management - plaice will be subject to the landings obligation in 2016 and although Welsh Government has yet to publish its discard plan (as required by the European Commission) it is believed that the WG will make an application for an exemption (as permitted by the regulation) for plaice on the grounds of high survivability. Recently published research in this area suggests survivability is in the region of 60-80% (cite). Most other member states with targeted plaice fisheries (such as the Dutch and Belgians) are known to be adopting a similar approach.

v) Summary – although commercially less important than bass, ray and sole, catching plaice is an un-avoidable by-catch when targeting ray or sole. The stock appears to be managed within sustainable limits but the low Welsh quota allocation and high levels of discarding present the potential for plaice to be a ‘choke’ species when the landings obligation is implemented for demersal stocks in 2015. The local industry is

aware of this issue and needs Welsh Government to secure an exemption from the landings obligation in order to prevent the trawling and netting fisheries for ray and sole being prematurely closed to the exhaustion of the plaice quota.

5.5.5 Sole

i) Introduction – landings of sole have increased over the last five years although it is un-clear whether this has been as a result of an improvement in the stock or increased levels of fishing effort. It makes an important contribution to the value of finfish in ports in the Swansea Bay FLAG area, accounting for 16% of the total value of fish and shellfish landed.

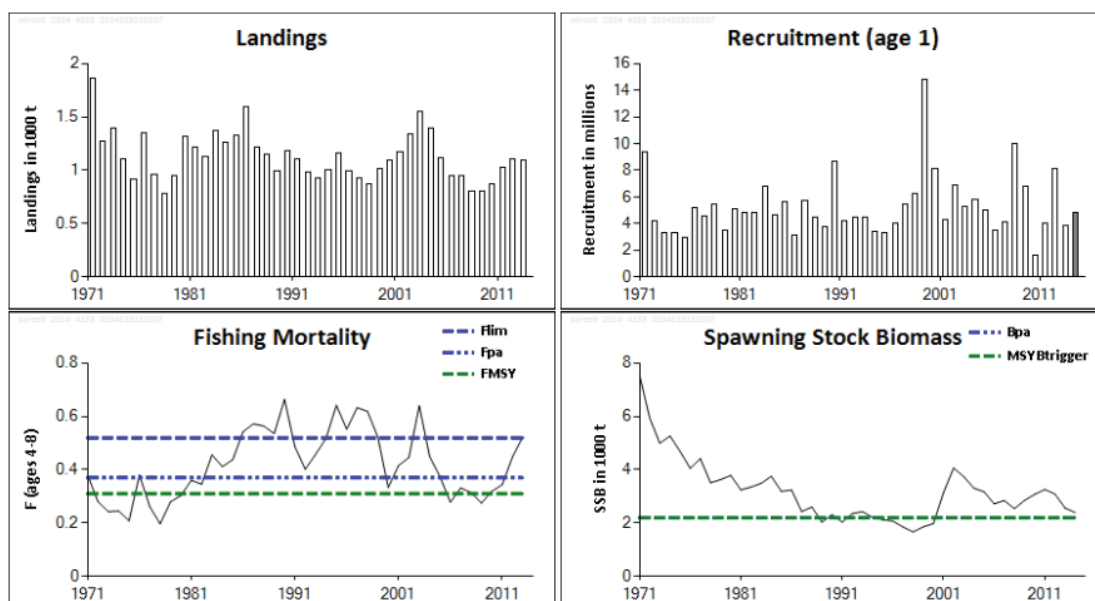
The main spawning areas for sole in the Celtic Sea are at depths of 40–75 m, off Trevoze Head (off the Cornish coast). Spawning usually takes place between February and April. Juvenile sole are found in relatively high abundance in depths up to 40 m, while adult sole (fish aged 3 plus) are generally found in deeper water. For this reason much of the sole landed from inshore grounds is of smaller size and hence less valuable.

ii) Stock – the sole stock in the Bristol (and St Georges channel) is independently assessed by ICES which co-ordinates the reporting of stock assessment data from governmental scientific institutions in 19 member states. It is tasked by the European Commission (EC) to provide fish stock assessments and advice to managers on fishing mortality levels to achieve MSY, a requirement laid down by the revised Common Fisheries Policy in 2013.

The graphs (below) provide evidence that following some strong recruitments and strict control of landings the stock is now very close fishing mortality and spawning stock biomass levels that would be in line with the MSY approach.

iii) Ecological interactions between fishing gear and marine environment – throughout the whole of the Bristol Channel area the main gear type for catching sole is the beam trawl, making up 86% of recorded landings by all member states. Within the Swansea Bay FLAG area the catches are made by inshore otter trawlers and inshore gill-netters. When considering the scale and intensity of the gears used against the known muddy, sandy, mobile seabed type it can be estimated that the environmental risk posed by these gears to seabed fauna and flora to be relatively low. Due to the shape and strength of the fish discards are low, typically less than 3% and therefore sole is not expected to present issues to fishery managers when the landings obligation is implemented in January 2016.

Figure 17: Sole stock assessment graphs (re-produced from ICES advice 2015)



iv) Management – using the stock assessments and advice sole is managed by the EU in accordance with CFP objectives for all commercial to be at (or on a trajectory to meet) MSY level by 2015. The principle fisheries management tool is a quota limit based on a calendar year starting from the 1st January each year. Under so-called ‘relative stability keys’ established in 1983 the UK receives 19% of the EU Total Allowable Catch (TAC) for Sole. Within the UK this is divided between the devolved administrations, with the Welsh Government receiving 3% of the UK allocation. Welsh Government is then responsible for setting quota limits for Welsh under 10m vessels on a monthly basis. Minimum gear mesh sizes and minimum fish landing sizes also apply.

v) Summary – the sole stock appears to be in relatively healthy condition and is being harvested at or close to ‘sustainable’ limits but with Wales only receiving around 7.6 tonnes of the UK annual quota there is little scope to increase effort or the number of boats targeting the fishery.

5.5.6 Cockles

i) Introduction

The Burry Inlet Cockle Fishery is a traditional source of food and employment for the local area, dating back to Roman and through mediaeval times. Traditional gathering was undertaken, usually by women, with cockles being returned to shore on donkeys. Each gatherer was then collecting around 2- 3 cwt (0.1-0.15 tonne) per day, with an estimated 250 gatherers at work in the estuary. In the 1920’s the horse-drawn cart was introduced, allowing gatherers to collect up to 10 cwt (0.5 tonne) of cockle each. In 1921 a minimum landing size was introduced by the then management authority, the South Wales Sea Fisheries Committee (SWSFC) to protect the breeding stock and in 1952 so many cockles were collected that SWSFC considered a limit to control daily landings.

In 1965 the Burry Inlet Cockle Order was established to licence the fishery and so control the quantity of cockle taken. Since then the number of licences has varied between 36 and 67. Poor recruitment of cockles in the early 1970’s, coinciding with

large numbers of oystercatcher (a species of wader, most abundant as overwintering flocks), led to culls of this species in 1973/74. Peak counts of oystercatcher were 20,000 with each bird consuming an estimated 250g per day, which led to estimates of 30-50% of cockle being taken, 5-10 times the take of the fishery. No culls have been permitted since this time.

The Burry Inlet, although not the largest, was once regarded as the most consistent cockle fishery in Europe. However, in recent years high summer mortalities have resulted in low numbers of cockles being recruited into the fishery. Also, in the early 2000's the fishery was closed, sometimes over the entire Burry Inlet and more frequently within certain zones, due to unacceptable levels of diarrheic shellfish poisons being reported from samples of cockles.

In April 2010 the SWSFC was taken into the Welsh Government (WG) and Environment Agency Wales (EAW) was made grantee of the Burry Inlet Cockle Regulating Order (BICRO); initially for a 2-year period). Existing licensees were eligible to hold licences, and these were confirmed for 36 licensees.

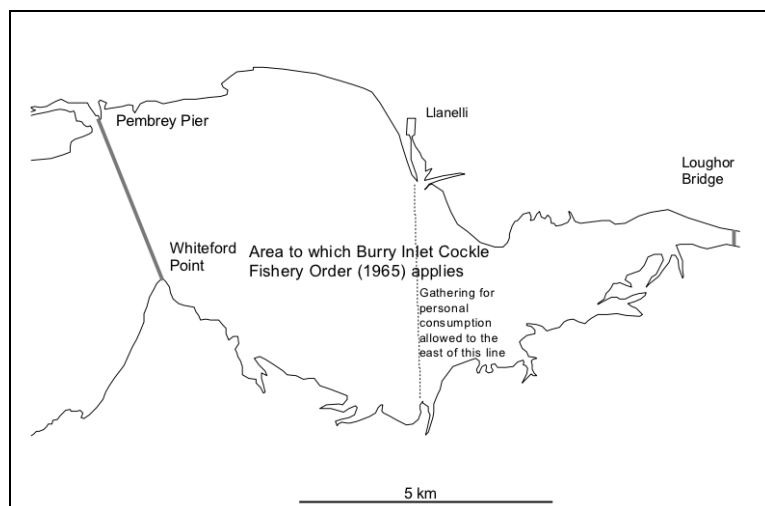
With effect from 1 April 2013, the Natural Resources Body for Wales, known as Natural Resources Wales (NRW) assumed responsibility for management of the Fishery pursuant to the Burry Inlet Cockle Fishery Order 1965 (the Order). The Order confers upon NRW powers to regulate the Fishery until 15 June 2025. Natural Resources Wales' aim in its management (pursuant to the Burry Inlet Cockle Fishery Order 1965) of the Fishery is to develop a thriving cockle fishery in the Burry Inlet which supports, protects and enhances the needs of the community and the environment upon which it depends.

In order to achieve this aim, NRW has identified and will pursue, through its management of the Fishery, the following 3 objectives:

- 1: to deliver and maintain a sustainable fishery which can provide regular income to licence holders
- 2: to avoid adverse effects on the European designated site and local residents
- 3: to improve management, monitoring and enforcement within the Fishery

The Burry Inlet Cockle Fishery Order 1965 Management Plan was approved by the Minister March 2015.

Figure 18: Extent of Burry inlet cockle fishery (source: MSC certification report)



ii) Stock

The cockle *Cerastoderma edulis* is a burrowing bivalve occurring on all British and European coasts. It is common in the intertidal and shallow subtidal, where it can occur in a variety of sediments, notably mud, sand and muddy gravels. Cockles live within a few centimetres of the surface and can be washed out en-masse during storms. Lifespan is typically 2-4 years and they spawn at the age of around 18 months.

Cockles have an extremely high reproductive potential, large number of spat may be produced from an extremely small stock biomass. Stock assessment surveys are currently carried out bi-annually, usually May and November. These were previously carried out by CEFAS, but are now undertaken by contractors on behalf of Environment Agency Wales (EAW). Previously, management of the fishery involved allocating one third of the cockle biomass to the fishery (one third for overwintering wader feeding, one third to maintain the spawning stock). In setting the TAC from 2011 a modelling approach was adopted to explore the relationship between oystercatchers and shellfish populations in order to inform policy-makers of the consequences for oystercatchers and the shellfish industry of alternative ways of managing shellfisheries (oystercatchers eating commercially exploited size-classes of shellfish).

iii) Ecological interactions between fishing gear and marine environment

As the fishery is a hand-raked operation, with cockle sieved and bagged also by hand, it is extremely selective. The take will therefore effectively be 100% cockle with no retained species. The process of raking and sieving of sediment will involve some disturbance of other sand-dwelling species. As cockles typically inhabit the top few centimetres of sediment, species affected will predominantly be small crustaceans and molluscs. These are not directly exploited by any fisheries and will be subject to some incidental mortality and community disturbance. However, the areas of cockle bed exploited in any year is a relatively small proportion of the total muddy sand habitat within the Inlet. There will, therefore, be extensive areas of habitat, similar to that on cockle beds, unaffected by the fishery. There will therefore be a high degree of certainty that bycatch species will be within biologically-based limits.

In addition to its importance for cockles, the Burry Inlet is also important for wildlife and is designated (amongst others) as a SPA and SAC. As discussed above, waders such as oystercatchers and knot are a significant feature of the site. EAW works closely with CCW and others in managing activities within the estuary.

iv) Management

The overall management objective for the fishery is to develop “a thriving cockle fishery in the Burry Inlet which supports, protects and enhances the needs of the community and the environment on which it depends”.

Supporting objectives are:

- To regulate the fishery according to current statutory requirements, taking into account the industry needs and its importance to the stability of the local economy.
- To protect the Ramsar, SSSI, SAC/SPA status of the site – i.e. nature conservation designations, the latter (SAC/SPA) identifying this as a site of European significance.
- To protect the MSC status.
- Continue to investigate cockle mortalities, communicate effectively with stakeholders and act upon the findings of the research

- Develop with stakeholders a clear vision of what is needed in the future to inform a new strategic plan with shared aims and a high degree of self-management.

These objectives are achieved primarily through the setting of a TAC so as to maintain a sustainable fishery and to prevent significant effects of cockle harvest on their key predator – overwintering oystercatchers. As discussed above, the TAC for 2011 was set to maintain the stock above levels empirically determined not to have a significant effects on cockle populations; future TACs are to be set so as not to significantly affect oystercatcher mortality (a precautionary target reference point). Both cockle and oystercatcher populations are well monitored. The TAC is allocated through a daily quota to the 36 licensed gatherers. Additional elements of the strategy include closed areas, minimum (and when required maximum) size limits and limits on the number of licenses.

v) Summary

The MSC standard is seen globally as the ‘gold standard’ in fisheries sustainability certification. Regulators, fishers and managers engaged in the fishery should be immensely proud that their work has allowed the fishery to get such recognition, which should provide the sector with market advantage in comparison to non-MSC certified cockle fisheries.

5.5.7 Mussels

i) Introduction

There is only one mussel producer within the Swansea FLAG area. Within the sheltered waters of Swansea docks mussels are sustainably produced using the rope growing aquaculture technique. The mussel larvae, which is in the water naturally, attaches itself to the vertical ropes where it develops into seed mussel. This seed is later removed and reattached to different ropes where the mussels are left to grow until they are ready for harvesting. No feed is added to the water, as there is sufficient food naturally available in the water for the mussels. This method of farming produces mussels with a clean, dark, shell, which are free from grit, as the mussels never come into contact with the seabed. The waters are reported to produce mussels with a high meat yield of between 25% and 30%.

ii) Stock

The mussel growing activity in the Swansea FLAG area is an aquaculture (growing) operation and therefore not subject to formal stock assessment.

iii) Ecological interactions between fishing gear and marine environment

The rope growing method of producing mussels has minimal interaction with the seabed. The seed mussels are not genetically modified and no additional feeds or medication is added to the water meaning that water quality is not adversely affected by the activity.

iv) Management

The Centre for the Environment, Fisheries and Aquaculture Sciences (CEFAS) authorised the dock as a shellfish production site in 2011. Water quality in the dock is continually tested to ensure it is of the highest quality. The aquaculture operation is operated to industry best practice guidelines and is currently undergoing assessment against the MSC standard.

v) Summary

The mussel growing activity does not have many of the possible ecological concerns often associated with marine capture fisheries. The rope growing technique is known to have a minimal environmental impact and if the operation is successful in its aim of achieving MSC certification that should help open up a wider market for the product.

5.5.8 Summary

The table below provides a sustainability summary of the harvested fish and shellfish fisheries of the Swansea Bay FLAG are:

Table 9: Summary of stock sustainability

	Stock	Management	Environmental impact	Overall risk rating
Bass	Red	Orange	Green	Red
Ray	Orange	Orange	Orange	Orange
Whelk	Orange	Red	Green	Red
Plaice	Orange	Orange	Orange	Orange
Sole	Green	Orange	Orange	Orange
Cockles	Orange	Green	Green	Orange

Stock – based on ICES advice or best available science (either at MSY, below MSY but not depleted, or depleted)

Management – based on reliability of science, management of fishery locally and across wider stock area (either full species management plan, no specific management plan but managed by CFP or neither).

Environmental impact – based on scale of impacts of fishing gears on seabed types based on findings of Seafish led expert working group (2012) (static gears on sandy seabeds having minimal impact and light towed gears on sandy seabeds in shallow waters having limited impact)

Risk rating – a combination of the above scores, if any score is deemed 'high risk' the overall score automatically becomes red

5.6 Supply chain analysis

The supply chains for fish and shellfish caught or harvested within the Swansea Bay FLAG area were investigated in order to identify to what extent fish and shellfish were sold locally, nationally and internationally. Where possible the opportunities for (and barriers to) higher value markets were identified.

5.6.1 Routes to end market

5.6.1.1 Wetfish

The first sale (i.e. from the boat to the first buyer) of around 80-90% of the finfish landed in the FLAG area takes place outside the FLAG area, with the majority being sold at auction in Plymouth and smaller quantities either being sold to a small number of wholesalers to the West of Wales (Milford) or a wholesaler in North Devon.

Fish sold at auction than can be sold to any one of the 50 companies buying from the electronic auction on a daily basis. Some of these companies will supply retailers, some foodservice outlets, others specialise only in export and some will supply a mixture of customers across all of these markets.

At present there are no chilled storage facilities at any of the landing sites and fishermen are responsible for transporting their landings using vans. Currently, there is limited direct selling to local hotels and restaurants by commercial fishermen but there is some evidence to suggest that the direct sales of bass by anglers to restaurants in the area are significant.

Determining with any degree of certainty the end market for the fish that enters this supply chain is difficult as processors and wholesalers may make up customer orders using fish from several vessels. However, through interviews with a range of processors and fish market managers (with detailed knowledge of fish supply chains throughout the UK and Europe) it has been possible to provide a best estimate or where different species of which are likely to end up (see table below)

Table 10: shows estimated end market values (£) of finfish landed by Swansea Bay FLAG fleet

	UK		Export (EU)	Export (outside EU)
	Foodservice	Retail		
Bass	46522	46522	0	0
Whelk	0	0	0	49321
Ray	13442	13442	11522	0
Plaice	1031	1719	687	0
Sole	17610	4402	22012	0
Lobster	9114	4557	31900	0

The end market varies for each fish species and can even vary depending on the size grade of the fish (e.g. dover sole). Most fish will be sold fresh (not frozen) and due to the quality and price of the fish sold it is un-likely to be processed on a commercial scale into value added products such as fish pies or ready meals.

The main finfish species are sold through the following channels:

i. Bass

Area typically sold to wholesalers and processors in Wales but when supplies (landings) are greater than demand, and quantities justify the transport costs, they are sold at auction in Plymouth. Processors and wholesalers buying from the auction will mostly supply specialist independent retailers and the foodservice sector in the UK. Smaller quantities will be sold into multiple retailers as the large majority of bass sold is farmed bass imported from Greece and Turkey. Very little processing of bass is carried either being sold whole or scaled and filleted.

ii. Ray

Are mainly sold into specialist ray processors in Aberdeen, Grimsby and south west England with small quantities being exported. These processors supply a mixture of retailers (supermarkets and independents) and UK foodservice outlets where they are still often sold as skate even though the landing of skate had been prohibited for 5 years. Ray processing involves winging the fish (if not done at sea) and skinning using a machine.

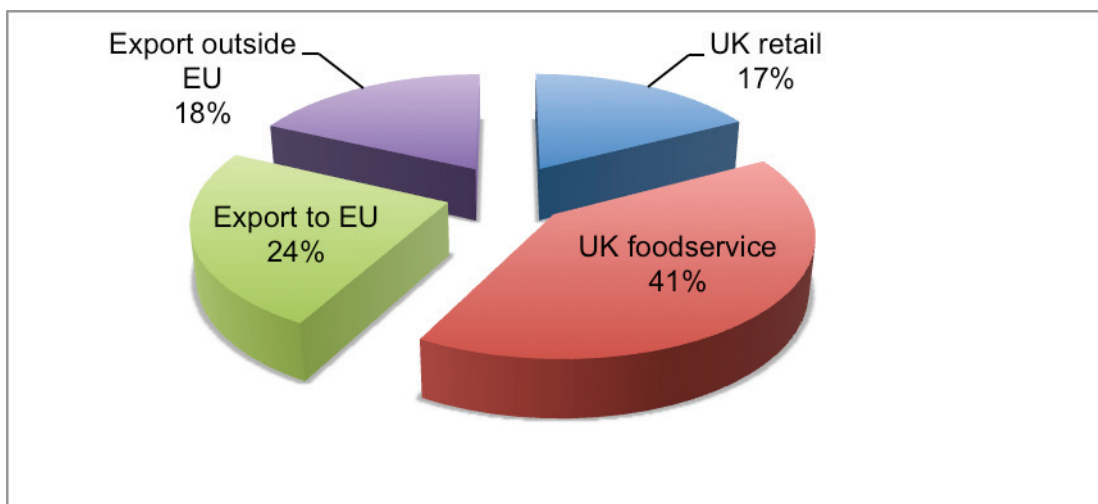
iii. Plaice

The main flatfish processors in the UK that supply most of the UK supermarkets are in the Grimsby area, but smaller quantities are bought on local markets by local buyers. Most is thought to remain in the UK and is sold through retailers and foodservice, with retailers taking the slightly smaller, cheaper sizes and restaurants paying more for fillets from larger fish. Larger processors use machines to fillet plaice while smaller processors fillet plaice by hand. Smaller size grades of fish maybe un-economic to fillet and sold whole.

iv. Sole

Medium and larger dover sole are often sold in the UK and are destined for restaurant tables while smaller grades of sole are known to command a higher price in Holland and Belgium. Fish sold in the UK will usually be skinned first whereas fish exported to Europe will simply be re-packaged, re-weighed and re-iced.

Figure 19: Value of estimated end markets for local finfish landings



5.6.1.2 Shellfish

None of the shellfish landed, grown or harvested in the Swansea FLAG area is sold at auction instead the first sale is direct to a processor or intermediary and is normally sold live. Of the landings from capture fisheries (i.e. whelk and lobster) over 95% are sold to companies outside the FLAG area (mostly to a company in W Wales) although are often collected by the buyer who delivers bait at the same time. Locally harvested or grown shellfish species (i.e. cockles and mussels) are primary processed 'in-house' and then sold to wholesale markets in the UK, Holland and Spain.

The main shellfish species are sold through the following channels:

- i. Whelk – over 99% of the whelks caught in the FLAG area are sold to processors in W Wales, NW England and SW England where they are either cooked and frozen whole or cooked and shelled, then frozen prior to shipping to end customers in the Asian market where they are considered a delicacy.
- ii. Lobster – are typically sold live and then stored in large vivier tanks (or lorries) until shipped to end-user where they are cooked (boiled) before serving. UK retailers sell cheaper frozen Canadian lobster (whole and tails) so the bulk of Welsh caught lobster is sold to restaurants locally, across the UK and mostly in France and Spain where there is a strong preference for European lobster over the Canadian lobster. There seems limited opportunity for value added products.
- iii. Cockles – upto 90% of locally harvested cockles are exported to Holland, Spain and France as a cooked and shelled product, which is then canned in brine. The remainder is sold through local markets, to wholesalers and retailers throughout the UK in a range of formats including pickled, fresh and frozen. Changes in European health regulations have meant investment by local cockle processors since 1993 and the need for capital investment has required a pooling of resources. Accordingly there are now only three processors on the south side of the estuary (two are family interests and a new co-operative). Most processing is undertaken locally. The cockle processing technique involves pre-washing, boiling and then cooking in their shell. The shells are then mechanically removed, by a shaker, leaving the cooked cockle meat. The cockles then go through various cleaning processes and then through cold water to cool them down before packaging. Packed weight sizes will depend on customer requirements. The market is reported to be under-supplied and the main processors see the poor management of many of the UK's cockle fisheries as the main barrier to further development. One company has therefore diversified into seaweed products and will soon launch these into UK retailers. There appears considerable opportunities but further market research in this area would be needed to quantify this.
- iv. Mussels – the EU market for mussels was some 600,000 tonnes in 2014 (source: Globefish) with three countries (France, Spain and Italy) accounting for 78% of market demand. Despite the strong demand from continental Europe 90% of UK rope grown mussels are believed to stay in the UK. The Scottish Association of mussel growers (representing the bulk of UK production) reports that 32% are sold through wholesalers, 42% through retailers and 26% to foodservice. Of total sales 40% are of cooked product and 60% is sold live. Rope grown mussels are harvested and (if local water quality conditions require it) are then depurated to remove any harmful toxins that maybe present, they are then bagged for

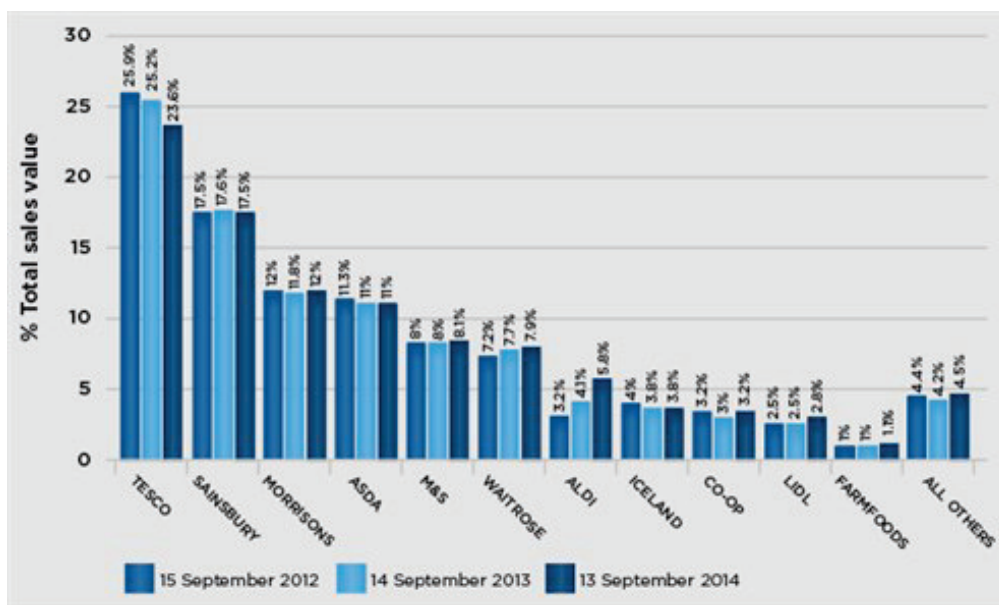
sale into UK foodservice, wholesale and retail. Sustainability accreditations such as Marine Stewardship Council (MSC) and Aquaculture Standards Council (ASC) were reported to be important for gaining access to supermarket retail markets but rarely resulted in a price premium being received. There is little scope for increased value-adding locally but there was thought to be a significant opportunity around developing a Welsh mussel brand to support better marketing and promotion as Welsh mussels were currently rarely being sold as being Welsh.

5.6.2 UK Retail markets

5.6.2.1 Sector overview:

In 2013 UK consumers purchased 351,000 tonnes of seafood products worth £3.2 billion, with the most popular species of seafood (by value) in retail were salmon, followed closely by tuna, cod, haddock and warm-water prawns and then cold-water prawns. Multiple retailers dominate the retail sales of fish and shellfish in the UK, accounting for around 95% of total retail fish sales with independent high street fish mongers making up the remaining 5%.

Figure 20: Chart showing breakdown of UK retail fish and shellfish sales 2012-14



Source: Seafish

Most of the major UK multiples have retail outlets within the Swansea Bay FLAG area selling over forty different species of fish and shellfish in a variety of formats: including fresh, frozen, canned and value-added ready meals. These are sold via fish counters, frozen aisle and chiller aisle space.

The fish offering and product ranging in two of the national retailer outlets in the area was assessed in comparison to the same stores at other locations in the UK. It was found that both the counter lay out and product ranging was very similar to those of the same company at other locations in the UK (in the South West and East of England).

It is likely that some of the fish caught by the local fleet and sold at Plymouth fish auction has found its way onto local supermarket fish counters.

5.6.2.2 Opportunities to increase sales to national retailers

The quantities and values of the seven main species of fish and shellfish caught or cultivated in the Swansea Bay FLAG area sold through UK retailers in 2014 are shown below (see table XX). Demand for these species clearly outstrips the supply from local sources so there is a theoretical opportunity; however, there are a number of significant barriers to supplying a UK multiple retailer that are explored in the next section.

Table 11: showing the rank, value and volume of the top 35 species of fish and shellfish sold by UK retailers

Species	Ranked sales	Sales value (£,000s)	Volume of sales (kg, 000s)
Bass	11	38,394	2,674
Whelk	> 35	n/a (outside top 35)	n/a (outside top 35)
Ray	> 35	n/a (outside top 35)	n/a (outside top 35)
Plaice	16	27,174	2,829
Sole*	14	30,148	2,474
Mussels	18	21,487	3,604
Cockles	27	6,289	647

* N.B. species of sole is not designated but likely to be lemon sole or combined sales of all sole species and much higher than dover sole which is only stocked in low volumes by retailers

5.6.2.3 Barriers to increasing local fish sales to retail

There are a number of barriers to supplying a UK retailer direct. The list below is not exhaustive but seeks to highlight the main challenges to fish and shellfish from Swansea Bay entering the retail supply chain.

- i. Cashflow – credit terms are typically 30 to 60 days
- ii. Premises – are expected to be British Retail Consortium (BRC) standard with respect to health and hygiene standards as a minimum; fish processing sites are usually to meet higher standards laid down by each retailers and which they can be audited against at any time;
- iii. Continuous supply - the UK retailer model is based around continuous product availability 365 days a year; the typically volatile fish supply chain (due to the effects of weather) does not therefore lend itself well to this model, with fish suppliers often carrying significant frozen stock in order to meet demand when fresh product cannot be sourced;
- iv. Product withdrawal – the supplier would have to pay the retailer compensation plus a fine;
- v. Fines – significant financial fines can be levied on suppliers if they fail to meet any contractual obligation;
- vi. Product specification – working to very tight margins supermarkets specify often narrow product size specification criteria so only a small part of any one catch could be used;

5.6.2.4 Summary

Given the significant capital investment required in processing infrastructure to supply UK retailers and the limited volume and diversity of fish and shellfish landed in the FLAG area the economic case for developing this opportunity appears weak. Notwithstanding these points there is scope for fishermen or shellfish growers to supply an intermediary processing company although while the capital investment is not required many of the same barriers also exist.

5.6.3 Local (FLAG area) retail sector

Due to the continued dominance of supermarket retailers in the UK retail marketplace, the number of independent fishmongers across the UK has been in decline for a number of years. There are nine fishmongers listed in the SBFLAG area, with three of these having stalls in the Swansea city market. These stallholders were approached for one-to-one interviews in order to assist the project in identifying:

- i. the end markets for locally caught fish
- ii. local demand for locally caught fish
- iii. the barriers to selling more locally caught fish
- iv. understanding the sector needs
- v. understanding the opportunities that exist

The key findings from these interviews were:

- a) Local fish sales
 - 100% of the fishmongers sold some local fish.
 - 10% (or less) of fish sold is locally landed.
 - Local species sold were: ray, plaice, bass, cod, mullet and dover sole
- b) Barriers to selling more local fish
 - Poor availability (continuity of supply)
 - Inconsistent quality
 - Price expectation
- c) Current sourcing practice all fishmongers sourced fish and shellfish were sourced across UK to provide the diverse and affordable range demanded by customers.
- d) Most demanded species / products Farmed bass and farmed salmon were the most popular species sold.
- e) Awareness of the FLAG there was limited awareness of the SBFLAG or knowledge of its activities.
- f) Promotion of local fish there was some support for more promotional campaigns and information around fish and shellfish caught in Swansea Bay, such as recipe cards and booklets

Figure 21: fishmonger counters in Swansea market



5.6.4 UK foodservice processors

Within the UK the two largest fish processors supplying the foodservice sector are M&J Seafood (part of the Brake group) and Direct Seafood Holdings. Both have multiple depots around the UK and, through intermediaries, have a presence on most fish auctions markets across the UK. M&J Seafood also supplement fish bought at auction with landings direct from a small number of vessels that specialize in certain fisheries e.g. line caught bass from Weymouth. Companies in this sector compete for customers on price, quality and service, with the latter been seen as the most important. As part of this 'service' these companies provide customers with background information on provenance, sustainability and seasonality in order to assist chefs in menu planning and marketing. Prices are keen as they use the scale of operation to bring down the costs of packaging and logistics (transport).

The customer base of each of these company covers thousands of foodservice outlets and hence the quantities of fish required are significant. To purchase the quantities and range of species demanded by their customers these companies rely heavily on buying from fish markets or direct landings where these are close to depot. The nearest of M&J's depots to the SBFLAG area is Cirencester while Direct Seafoods have two subsidiaries in Brixham. Therefore, the distance between vessel and buyer, along with the narrow range of species landed, inconsistent landing patterns and relatively small volumes of landings are likely to be significant barriers to direct supplying these companies. However, this should not be rules out altogether.

5.6.5 Fish wholesalers and processors within the FLAG area

Within the SBFLAG area there was one company that specialised in the supply of fish and shellfish to the foodservice sector, with over 200 customers within a 150-mile radius of Swansea. In Cardiff there is another larger fish processor, thought to be the largest fish supplier to foodservice sector in Wales. As with the UK-wide operators in this market the key aim of these businesses is to minimise preparation time for chefs. To achieve this, these companies undertake basic primary processing such as scaling, skinning, gutting, pin boning, filleting and portioning to individual chef requirements.

Both companies reported that customers expected them to have a high quality offering of a diverse range of fish species all year round, explaining that a missed order due to a fish being out of stock could result in the customer switching to another supplier. Although both companies reported buying small quantities of fish from vessels in the SBFLAG with such high stakes and large customer bases these companies could not be solely dependent on locally sourced fish. Currently, in excess of 90% of their fish was being imported into Wales from multiple fish markets and wholesalers the length and breadth of the British Isles. Furthermore, both companies reported that the quality of fish bought locally could be improved.

The main fish wholesaler in the region lies to the west of the SBFLAG area, the 'fish hub' site previously run by Channel Fisheries is now being operated by an independent wholesaler. At present this business does not undertake any processing or sales direct to the foodservice sector, instead it operates as a wholesaler consolidating small quantities of fish bought from a large number of vessels along the coasts of South Wales to make up larger quantities of fish to sell into larger processors in England.

5.7 Local demand

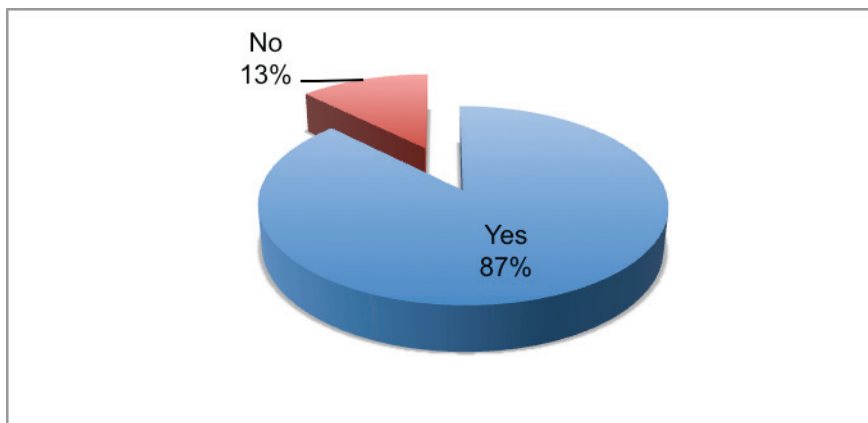
The local demand for fish and shellfish products caught and harvested within the FLAG areas from retailers, mongers, processors and restaurateurs was assessed through a mix of stakeholder engagement and internet survey.

5.7.1 Restaurateurs

A short, ten-question internet survey was sent to 28 restaurants and hotels known to be selling fish and seafood to understand current fish sourcing trends and identify further opportunities for develop. The survey received a 28% response rate and highlighted the following points:

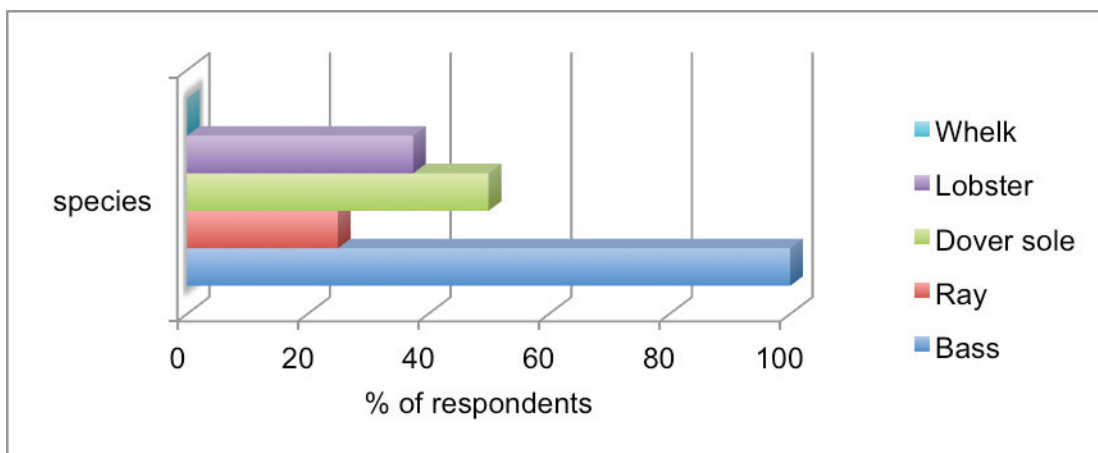
- i. Local sourcing – restaurateurs were asked to describe their sourcing of seafood - 87% of respondents reported that they currently served some locally grown / caught / harvested seafood products, while 100% reported that they would like sell more.

Figure 22: SWBFLAG restaurateur survey response on local sourcing



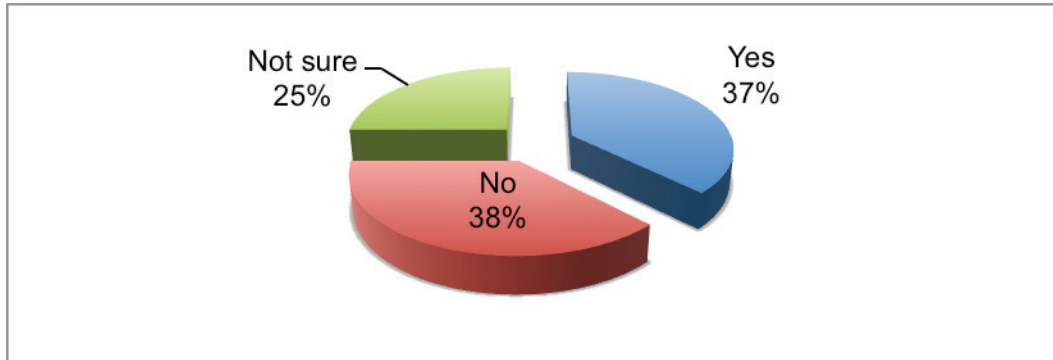
- ii. Demand for locally caught fish & shellfish species – 100% of those surveyed indicated that currently sold (or would like to) bass on their menus. Perhaps unsurprisingly 0% of respondents sold whelks.

Figure 23: SWBFLAG restaurateur survey response on fish & shellfish species sold



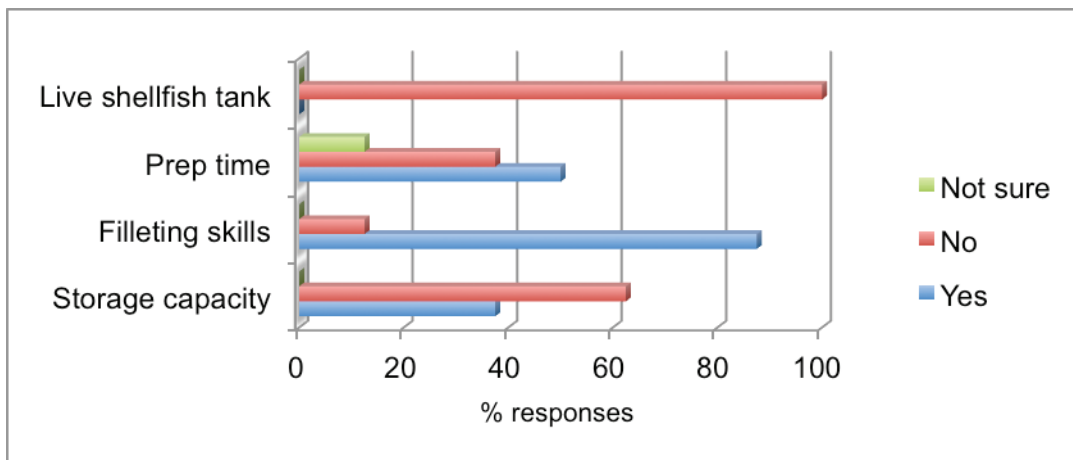
iii) Legal – there were mixed responses to questions relating to the proper legal process for recording and reporting catches bought direct from fishermen, with 38% being unaware that they are required by law to be registered as a Registered Buyer and Seller (RBS) of fish to do so.

Figure 24: SWBFLAG restaurateur survey response on awareness of RBS



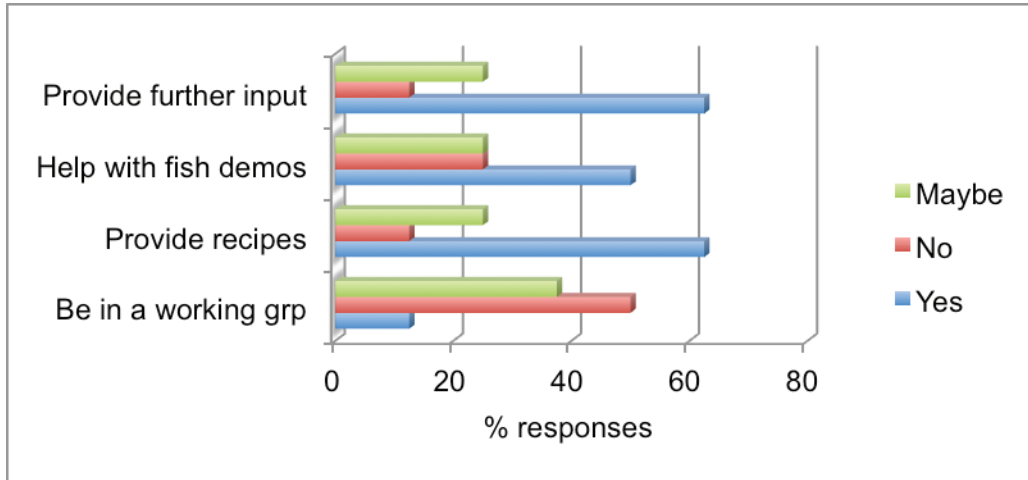
iv) Skills – respondents were asked to provide information on likely constraints to sourcing more fish direct from local fishermen and growers. None had the facilities to store live shellfish and others highlighted chilled storage capacity and time issues as being possible constraints.

Figure 25: SWBFLAG restaurateur survey response on sector constraints



v) Support that could be provided by the sector – respondents were polled on what assistance they could provide. There was strong support for providing recipes and taking part in demonstrations but less support for working with the sector to help develop direct supply channels.

Figure 26: SWBFLAG restaurateur survey response on assisting SBFLAG work



Wholesale / processors

Fish processors supplying the foodservice sector in Wales reported that “the foodservice supply chain does not rely on local fish in any shape or form”. It was explained that the supply chain was elastic enough to expand and accommodate to local catches when in season. These companies were not against local sourcing but merely realistic in that local supplies could not cover a fraction of their customers demands.

UK retailers

A national retailer confirmed that most UK retailers were keen to develop regional supply chains and promote the provenance of locally sourced food, particularly seafood. In addition, at least one UK retailer was known to have investigated setting up a ‘Welsh seafood; offering in its stores but concluded that there was insufficient continuity of supply and local processing infrastructure to support the concept.

Therefore, while there is clear demand from the sector the economic business case is not there to support direct selling of locally caught ‘finfish’ species to supermarkets from the local fishing fleets. However, quantities of locally harvested cockles and mussels could be offered on a scale that would meet supermarket demand and the potential for supplying these species should be further explored.

5.8 Recreational Sport Angling

5.8.1 Introduction

Recreational sea angling is one of the country's most popular sports and is known to contribute substantially to local economies, and support many businesses. These might include fishing tackle retailers and manufacturers, bait suppliers, boat sales and suppliers, charter boats, specialist magazines, and local tourism and accommodation providers

In 2012 Cefas attempted to more accurately quantify the catches and economic value of recreational sea-angling in England¹. The study used the Opinions and Lifestyle survey, run by the Office for National Statistics (ONS), to estimate the number of sea anglers in England and how often they went fishing from shore, private or charter boats. Each month in 2012, 67 postal sectors (58 from England, 3 from Wales and 6 from Scotland) were selected at random, and 30 addresses were randomly selected from each sector to participate. From these, 12,619 private households provided face-to-face interviews during 2012.

From the responses given, it was possible to estimate how many Around 2.2% of the adult population of Great Britain (GB), representing 1.08 million people, went sea angling in 2012 - 884,000 from England, 76,000 from Wales and 125,000 from Scotland (Box 7). Shore angling was the most popular activity followed by private boats and charter boats.

5.8.2 Sea fishing

i. Shore

With its fast running tides, sandy beaches and rocky headland the Gower peninsula offers some of the best rock fishing for bass in the UK and is therefore a 'must see' venue for the many specimen bass anglers. For the less experienced family angler or holiday angler the SBFLAG coast has a number of piers and breakwaters (such as Swansea and Mumbles), which offer safe, easy access to good fishing.

The FLAG area is served by well-established angling clubs that put genuine emphasis on education and outreach to wider community, tackling a range of social issues with young people through angling as a medium. This work is amongst the best in the UK and should be highlighted as best practice to other FLAG areas with a large RSA sector. The sector groups have further project ideas and these should be considered under any future funding programmes.

ii. Charter angling sector

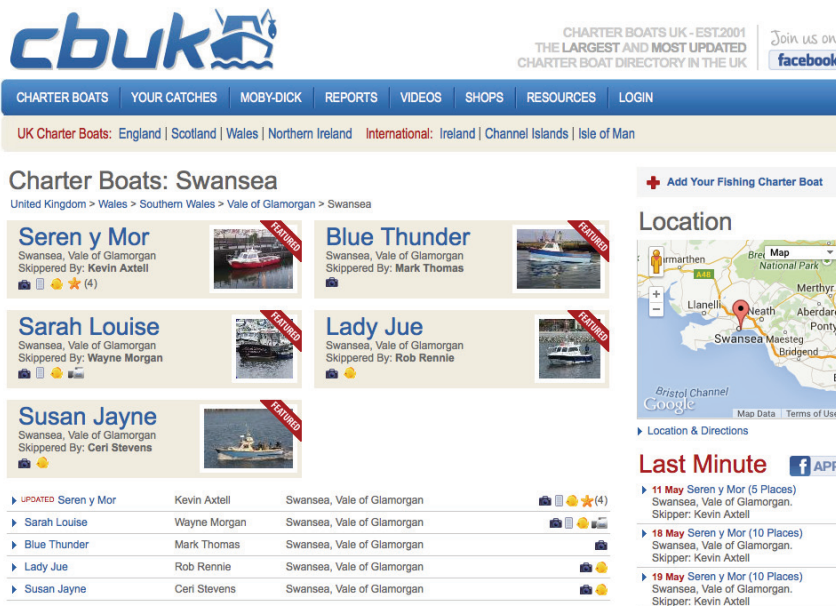
The charter boat angling sector is well established in the FLAG area with Swansea being the largest charter angling ports in Wales as well as being a popular pan-UK charter angling destination. During the autumn and winter, cod and whiting are the dominant species caught at Swansea, but from April through to October a much wider mix of fishing is on offer.

¹ Sea Angling 2012 – a survey of recreational sea angling activity and economic value in England. Commissioned by Defra.

The popularity of Swansea as a charter port has been built in part on the quality of the angling experience in local waters and in part due to accessibility due to its proximity to the motorway network and safe marina access.

In the 1990s Swansea had around twenty charter vessels operating from the port, but since then the sector has been in decline. Today, the port currently has six charter vessels operating although only one of these is truly full-time with the others operating seasonally or flexibly around other paid work.

Figure 27: Screen grab from charter boats UK website showing some of Swansea's charter boat fleet



Stakeholders in the charter angling sector were interviewed, providing a range of reasons for the decline in the popularity of Swansea charter angling in recent years, these included:

- declining mackerel catches during the summer months
- lower catch rates
- visitors heading further west
- closure of some campsites resulting in less visitors
- decline in the number of working men's clubs
- premiership football providing an alternative leisure activity
- economic downturn
- anglers buying their own boats
- less young people going angling

5.8.3 Freshwater fishing

i) Game Fishing

Inland the Swansea Bay FLAG area also hosts a number of game fisheries and Welsh rivers account for more than half the sea trout caught in England and Wales, making it a popular destination. Wild brown trout are abundant locally and the rivers of South Wales are gaining in reputation for the quality of their grayling fishing. Specialist guides are available to take guest anglers to the best spots and it was suggested that this area of business could be improved through better promotion and marketing.

Coarse

There are also a limited number of coarse angling fisheries in the area.

5.8.4 Tackle shops

Stakeholder from the angling shop sector reported that internet sales for tackle and gear had dented business in recent years but that fresh bait sales had held up over the same period. A significant part of business was in selling start-up rods, reels and tackle to visitors to the area. The tackle shops provided advice on where, when and how to fish as part of their service to these customers but felt that more could be done to signpost safe fishing spots to tourists.

A number of ways of attracting anglers from outside of the area and for promoting the quality of the areas shore angling experience discussed. There was a strong view that social media channels providing the best means of communicating with the 'serious' anglers. There was less agreement on the usefulness of competitions in attracting anglers although this strategy has been put to good effect elsewhere (e.g. in Pembrokeshire).

6. Discussion and analysis

Based on the analysis of desk research and stakeholder intelligence gained through interviews this sections provides a review of the FLAG strategy. The review provides an informed approach to prioritising and re-defining objectives from the 2012 strategy.

6.1 Theme 1: Strengthening competitiveness of local fisheries

There was strong cross-sectoral support for this theme but there was less clarity on the mechanisms and structures needed to deliver the objectives. Additional high priorities objectives were also identified. Table 12 (below) summarises these strategic priorities and provides examples of projects aimed at addressing similar issues on other areas.

Table 12: Analysis of strategic priorities in order to strengthen the competitiveness of local fisheries

Theme 1: Strengthening competitiveness of local fisheries		
<u>Objectives</u>	<u>Priority</u>	<u>Rationale</u> <u>Examples</u>
1. Achieving better links with schools and colleges to encourage young people to help develop the sector	High	There was universal agreement from all sectors of the fishing community that the fisheries sector needed to be more visible to the public and outward facing. A clear communication strategy is required to allow those within the fishing community to be aware of the opportunities provided by the FLAG. An important strand of such a strategy would be schools engagement through a range of activities and use of multi-media tools (website, social media, print media).
<u>Examples</u>		<ul style="list-style-type: none"> - Encourage businesses across the 'net-to-plate' supply-chain to engage and support activities to provide supply-chain visits for local schools - learning about the history of the cockle industry through visits or short DVD film - encourage and propagate links between seafood chefs and schools to develop recipes and provide 'in school' demos to help raise awareness of local seafood
2. Development of opportunities for practical work experience or placements	Med	Although there was recognition of a lack of new entrants and an ageing industry profile there was little evidence to suggest that vessels were sailing short of crew. One vessel had recruited one crewman from outside the area though.
<u>Examples</u>		<ul style="list-style-type: none"> - foster links with the local job centres - collaborate with other ports in adjacent areas to support 1 intake of the 3-wk introduction to commercial sea fishing course each year - develop a small group of skipper mentors would be prepared to take certificated trainees on 'taster trips'

3. Provision of opportunities for networking and promotion for the local industry	Med	There were mixed views from fishing industry stakeholders on the benefits gained from undertaking networking activities. However, experience from other FLAG groups in other areas and wider industry suggest that networking of fishing professionals through study visits and exchanges can be invaluable and can provide the catalyst for change to new approaches or new fisheries. Leaders work with the sector and bodies such as Seafish to identify suitable areas to visit to further.
<u>Examples</u>		<ul style="list-style-type: none"> - undertake a study visit to a razorfish fishery - set up a working group with regulators, scientists, eNGOs and fishermen to develop an ecologically sustainable model for a razorfish fishery
4. Improvement of links with local food and other producers and local markets	High	There was strong demand from the local foodservice (hotel and restaurant sector) to develop links with the local fishing fleet and shellfish harvesters.
<u>Examples</u>		<ul style="list-style-type: none"> - provide information on local seafood, diversity, and seasonality through range of low-cost media tools - encourage informal supply chain networking events between fishermen and chefs to build dialogue and identify opportunities for direct sales
5. Develop and deliver infrastructure projects to provide the basic infrastructure required to support a competitive industry	High	The need for basic core infrastructure at fish landing sites to support safe cannot be over stated. The strength of any future marketing or promotional work to promote local fish will ultimately depend on the quality of the product. Fish quality was not directly assessed during the study but fish markets, local fish mongers, foodservice suppliers and suppliers to national retailers all commented that quality could be better. This could almost certainly be improved through better access to ice and supporting the investment on ice bins on vessels.
<u>Examples</u>		<ul style="list-style-type: none"> - small scale ice plant - chilled quayside storage - landing davits - weighing scales - ice bins for vessels

6.1.1 Case study 1: Prince's Trust course (Cornwall FLAG)

Title	Getting young people into commercial sea fishing
Strategic aim	To tackle the issue of crew shortage by increasing the attractiveness of the fisheries sector to young professionals.
Project description	With funding from Cornwall FLAG Seafood Cornwall Training (SFC-T) in collaboration with the Prince's Trust successfully delivered a series of training courses aimed at attracting younger recruits into the fishing industry and seafood catering. The commercial fishing course, accredited by Seafish, the UK's

seafood authority, the three-week introduction to commercial fishing, equipped candidates with the basic skills and knowledge to work at sea in a safe and efficient manner. The seafood catering course was delivered by Padstow Seafood School to develop skills and learning for young people interested in the shore-based part of the industry and also seafood catering.

Working in partnership with local job centres and social services the project offered short one-day “taster” sessions. Trainees also got the opportunity to develop interview skills and improve their CVs to help them find work. The commercial fishing course was led by qualified Seafish instructors, many of whom are active or retired fishermen, so the participants got a real insight into the lifestyle and social aspects of the industry, while direct contact with skippers also helped boost job opportunities.



Funding package	FLAG £38,900 MMO £12,970 Private £ 17,630
Results	<ul style="list-style-type: none"> • 19 young unemployed people have subsequently found work in fishing and fishing related sectors. • Ex-skippers volunteered as trainers / mentors and gained qualifications as trainers • Social issues and divides such as ageism, sexism and substance abuse were bridged informally with older and younger generations gaining understanding of and respect for each other
Relevance & transferability	Although not a high priority in the Swansea FLAG the project shows how FLAG funding can help attract new entrants to the fishing industry.

6.2 Theme 2: Restructuring and redirection of economic activities

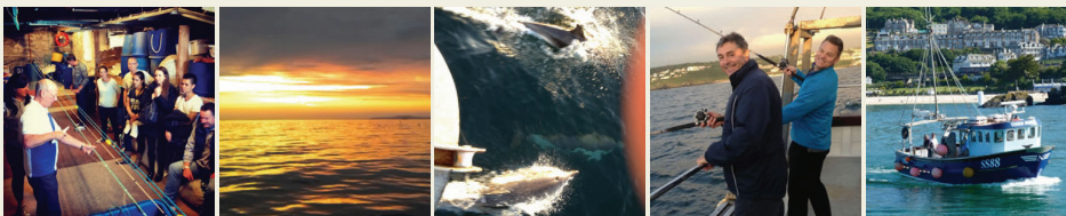
Table 13 : Analysis of strategic priorities in order to assist the restructuring and redirection of economic activities

Theme 2: Restructuring and redirection of economic activities		
<u>Objectives</u>	<u>Priority</u>	<u>Rationale</u>
6. Support for local businesses needing to restructure		Elements of the catching sector would like to leave the industry, while others sought assistance to diversify to business to explore new opportunities.
<u>Examples</u>		<ul style="list-style-type: none"> - consider de-commissioning scheme - assistance to those wishing to convert vessels to enable diversification into 'pescatourism' or workboat work - training and marketing support
7. Development of opportunities to develop the tourism sector linked to local fisheries		There was strong support for improved links between the tourism sector and recreational sport fisheries (freshwater and seawater) in order to improve marketing of the sector.
<u>Examples</u>		<ul style="list-style-type: none"> - sector development strategy and improved marketing - websites / app /social media - guides / posters in tackle shops - signs in popular areas for easy access fishing locations
8. Making the most of the natural environment		The outputs sought from this objective should be more clearly defined to assist potential applicants. For example, seaweed growing projects and redevelopment of the razorfish fishery could be eligible activities to make the most of the natural environment
<u>Examples</u>		<ul style="list-style-type: none"> - seaweed culture and market development - develop of a management plan to support a sustainable razorfish fishery.

6.2.1 Case study 2: Pescatourism 'Come Fish With Me' (Cornwall FLAG)

<u>Title</u>	Come Fish With Me
<u>Strategic aim</u>	To diversify economic activities of a commercial fishing vessel
<u>Project description</u>	Based on the successful 'pescatourism' trips offered by commercial fishermen in France and Spain the project sought to develop the 'pescatourism' in Cornwall. The trips offered corporate and public clients demonstrations in net making, sustainability advice, fish quality guidance and 'hand on' access to commercial fishing. FLAG funded some modifications to the vessel and helped towards the purchase of non-mandatory safety equipment. The project also funded the development of marketing materials such as an e-commerce website and company branding.

Find out more about our fishing trips



Come Fish With Me for a unique and detailed insight into the provenance and sustainability of Cornish fish and seafood.

Through informal discussion and presentation on land, in our 100-yr old net cellar, and at sea aboard "Tegen Mor", learn more about the commercial harvesting of fish and shellfish using a range of fishing gears. We will insight into the provenance, quality and sustainability of fish we catch. We'll even make sure you go home with some fish to eat (catching to order where possible!)

We offer a range of trips catering for all levels of interest from casual foodie to Masterchefs and both corporate and public clients alike.

If you want to make a full day of it we can take you to Newlyn to visit the largest fish auction in England; recommend a local cookery school to learn how to fillet and cook fish or simply places to try fantastic Seafood dishes. If you want something a bit different please contact us with your requirements and we'll come back to you some ideas, availability and costings for you.

We also offer a range of trips for nature lovers and sea anglers. See more here (insert link)
Places on all trips are strictly limited so to avoid disappointment why not book today and 'Come Fish With Me'...

on Twitter

This is what we do, why not come fish with us

<https://t.co/YezZJULPj4>

#nettoplate #flag

@Serge_at_FARNET

BY_X_ONE_DAY_AGO

RT @BD_Stew: Just incredible! Spider #crab pyramid formed during spawning aggregation
<http://t.co/pnlo3vAUap>
#CrabsrCool @mcsuk
<http://t.co...>

BY_X_X_DAYS_AGO

@MumblesOysters ... Fancy a day out??

Funding package	<p>FLAG £ 8000</p> <p>MMO £ 1000</p> <p>Private £ 3000</p>
Results	<ul style="list-style-type: none"> the project underperformed in year 1, due to launch delayed trips delivered to 3 groups of buyers from UK supermarkets, 2 groups of professional chefs and a small number of trips for the general public
Relevance & transferability	<p>The project has yet to prove itself as being commercially successful but the concept appears sound. It is relatively low cost and could be easily transferred to the Swansea FLAG area where there is a similar profile of 'gastro-tourism' developing as seen in Cornwall. Furthermore, there could be scope to collaborate with the University or other seafood businesses.</p>

6.3 Theme 3: Diversification activities including creation of additional jobs outside the fisheries sector

Table 14 : Analysis of strategic priorities in order to support diversification activities including creation of additional jobs outside the fisheries sector


Theme 3: Diversification activities including creation of additional jobs outside the fisheries sector		
<u>Objectives</u>	<u>Priority</u>	<u>Rationale</u>
9. Helping the local fishing industry needs to look at alternative sources of income	High	The local fishing fleet is in need of help to identify and access alternative sources of income from the sea. Fishing communities the length and breadth of the UK have faced similar challenges to those seen in Swansea.
<u>Examples</u>		<ul style="list-style-type: none"> - one-to-one support for local fishermen to identify and work through barriers to identified alternative income sources. - support for fishermen looking to obtain the RYA offshore yachtmaster (commercially endorsed) qualification as this would open up significant opportunities in the windfarm support sector
10: Sustainable and balanced development of the potential of the heritage and tourism aspects of the coastline	Low	The cockle industry provides an example of heritage activity that remains commercially operational today. From a touristic perspective the area offers a broad mix of exposed rocky headlines, Atlantic facing surf beaches that are popular with surfers and sea anglers.
<u>Examples</u>		<ul style="list-style-type: none"> - communication boards at key ports
11: Provision of training to support the current and future workforce of the local fishing industry		There was strong demand from onshore supply chain businesses for fish processing apprenticeships and knife skills training. Further development of the marine skills (in sea fishing context) apprenticeship with local stakeholders (i.e. fishermen, training providers and colleges) was also discussed.
<u>Examples</u>		<ul style="list-style-type: none"> - provide funding for training to help those wishing to diversify e.g. RYA offshore yachtmaster - provide skills / training brokerage - development of individual training plans to achieve defined career goals e.g. to work on windfarm - undertake a training needs analysis of the onshore sector workforce and local training delivery structures

6.4 Theme 4: Adding value to fisheries products

Table 15 : Analysis of strategic priorities to support adding value to fisheries products

Theme 4: Adding value to fisheries products		
Objectives	Priority	Rationale
12. Provision of support for trying out new processes or adding value to products to help small companies in the fishing industry to grow	Low	The local catching sector does not have sufficient volume, diversity or continuity of landings to support fish/shellfish processing activities at significant scale, although maybe limited scope for 'cottage industry' scale value adding, such as the product of fish pies or dressed lobster. Such activities could be carried out in a domestic kitchen (subject to sign off by a local environmental health officer). There is the potential to explore with cockle harvesters and mussel growers but a focus on regional marketing was seen as a higher priority by businesses in these areas.
Examples	-	Exploration of packaging techniques to extend product shelf-life, high pressure processing are all examples of previous work by regional seafood bodies to help 'add value' to seafood products.

6.4.1 Case study 4: Regional fish quality brand (EFF Axis 3)

Title	Seafood Cornwall
Strategic aim	To develop and promote a regional seafood quality mark in Cornwall in order to create increased demand for local fish and seafood
Project description	With funding from Seafish and EFF (Axis 3) a not for profit company was set-up by with directors drawn from across the of the seafood
	
Funding package	EFF Axis 3 £ 120,000 MMO £ 30,000

	Private £ Seafish match-funded with staff time
Results	<ul style="list-style-type: none"> • Fish quality standards demonstrably improved • Regular articles in trade and local print and e-media • 'net-to-plate' visits brought > 100 chefs to Newlyn to learn about the quality, diversity and sustainability of local seafood • set-up the successful line caught tagging scheme, providing total traceability for buyers and end customers
Relevance & transferability	<p>The Seafood Cornwall project was a headline project identified by the Cornwall Fisheries Taskforce in 2002. The project helped bring disparate interests together under a common banner and acted as a co-ordinator to develop and deliver a wide range of projects. Whether on a smaller Swansea Bay scale or a Seafood Wales scale a similar project could provide focus, energy and direction to a number of smaller low cost projects to improve local awareness of the fishing industry and grow local supply chains.</p>

7. Conclusions

7.1 Fishing fleet

The fishing fleet and landings from the Swansea Bay FLAG area have been in steady decline for a number of years. The reasons for this are unclear but in all probability unlikely to be due to the effects of the local fleet on stocks and more likely as a result of a higher level of fishing effort in the Bristol Channel. This has also had a significant impact on the charter angling sector. The harvesting of local fish stocks is though likely to be at or close to capacity of local stocks and limited quota availability.

Emergency stock recovery measures currently being developed by the EU to arrest the decline in bass stocks are likely to result in a significant reduction in fishing opportunities for local boats, potentially causing more vessels to leave the fleet. Local pot fisheries (for lobster and whelk potting) appear at maximum capacity with little scope for further effort to be introduced into the fleet. The plans to build a tidal lagoon in Swansea Bay was also causing some un-certainty amongst fishermen.

Morale of the fishermen was generally low and the age profile of skippers and crews is increasing. There are limited opportunities for young people to join the industry but the provision of training for people fishing to join the industry should not be ignored. Support should be provided to those who wish to diversify activities within the industry, for example by providing 'pescatourism' trips or enabling vessels to become workboat coded in order for them to provide services during the building of the tidal lagoon.

7.2 Stock sustainability

Many of the key fish and shellfish stocks targeted by commercial fisheries appear to be fully-exploited or in decline. The reasons for this are unclear but suggested to be a combination of subtle changes in environmental factors and overfishing of Bristol Channel stocks by offshore fleets from France, Belgium and England. Irrespective of the reasons for this the introduction of additional fishing effort in the area should not be encouraged. Other sectors however, such as cockle harvesting and mussel growing have stronger provenance and sustainability credentials and these businesses should be supported to better promote and market their produce.

7.3 Markets for fish

The low scale of landings, limited catch diversity, poor infrastructure, distance to key markets and poor continuity of landings are all barriers to significantly improving the markets for locally fish at UK retailer or UK foodservice scale. However, there is limited opportunity to develop better links with the local foodservice sector and these should be further developed.

Fish processors and fish mongers within and adjacent to the SBFLAG area have limited appetite for developing closer links with the local fishing fleets. The reason for this is their assessment of the economic cost-benefit analysis. On a broader level they would however strongly support the further promotion and marketing of local seafood through local marketing and events.

Within the Swansea Bay FLAG area restaurants, pubs and hotels in the Gower peninsula and Mumbles area in particular are fast becoming gastronomic destination within the UK. These restaurants are keen to develop closer links with the local fishing industry and should be encouraged through organised supply chain networking events.

On a generic level there is strong support across supply chain sectors for local events and activities to promote the consumption of fish and shellfish. Such activities could be incorporated into the existing Mumbles Oyster Festival or evolution into a Swansea Bay Seafood event. There is a wide range of cost-effective fish promotional campaigns that have been delivered by other FLAG areas across the UK and Europe and these should be reviewed to inform any future activities in this area.

7.4 Mariculture / aquaculture

As a result of favourable geographical features and environmental factors the SBFLAG area supports the largest cockle gathering fishery and the largest producer of rope grown mussels in Wales. Further work should be conducted to understand how the FLAG can best support businesses in the sector.

In addition, to the fledging oyster fishery being re-established in the bay there is evidence of considerable potential in local razorfish stocks. The SBFLAG area had a small but economically productive hydraulic dredge fishery in the past but concerns over its wider ecological impacts led to the closure of this fishery. This fishery was closed due to concerns over the environmental impacts of the fishing gear on seabed communities. . In order to develop a low impact alternative methodology Seafish and SWWFC (the fishermen's association) developed and successfully delivered a European funded project on the use of electro-stimulation to extract animals from the seabed.

This extensive project demonstrated that low voltage and low current DC electrodes could stimulate the razorfish to exhibit its escape response of leaving its burrow (Woolmer et al, 2011). The progression to a pilot scale fishery has been stalled for the last few years. The potential value of this fishery is significant and as an alternative fishery is badly needed by the local industry. Therefore, as a high priority steps should be taken to carefully develop a model for sustainable harvesting of local razorfish stocks based on global best practice, networking with razorfish fisheries in other FLAG areas and using the best scientific resources and advice available. Possibly this could take the form of a commercial trial with associated monitoring for possible effects on other species.

The authors of the research report concluded:

“Given the commonly reported negative effects of alternative approaches such as hydraulic and toothed dredges the results of this study suggest that further development work is warranted in order to develop less disturbing fishing gears, both for Ensis spp. and for other species”

The growing of seaweed has already been supported by the FLAG and enabled a local business to access UK-wide retail market. The sector sees further growth opportunities as market demand builds and hence further projects should be supported. With support to demonstrate its sustainability credentials through MSC certification (or similar) the mussel growing operation in Swansea Docks could access higher value markets.

7.5 Recreational sport angling

The SBFLAG area has a strong reputation for both its sea angling and game fishing opportunities. Swansea's position as one of the leading charter angling ports in the whole UK fleet has declined. There appear to be many factors that have contributed to this decline, these include: increase in technology gaming by younger people, lower catch rates, decline in working mens clubs, the rise of premiership football and an increase in anglers owning their own vessels. The sector appears under serious threat as number decrease and in order to safeguard the sector a small working

group should be set-up to benchmark the offering and marketing of the local charter fleet compared to those seen as best practice within the sector.

Tackle shops report and clubs reported that shore angling appears popular with three distinct groups emerging: i) the holiday angler; ii) the family angler and iii) the bass hunter. The latter group is largely self-sufficient within peer-to-peer groups on social media; however, the other two groups could be better informed in a number of areas, such as where / when to fish safely, minimum landing sizes and seasonality.

In other areas fishing competitions were seen as useful way to increase business but within the SBFLAG sector there were mixed responses. Despite the lack of support from sectors it is suggested that further discussion around the potential of competitions should be explored by a sub-group of relevant FLAG stakeholders.

The community outreach work undertaken by local angling clubs should be highly commended as serve as a model to others. The activities of these groups should be fully understood by the FLAG and supported where possible.

7.6 Project animation, delivery and communication

There were a number of organisations and individuals across the FLAG area that had no awareness of the FLAG or its activities. Furthermore, there were also a number of SBGLAG area stakeholders with potential project ideas with a strong strategic fit to the themes and objectives set by the LDS but who did not pursue EFF FLAG applications under the last funding round. If the FLAG is to meet the aims of the programme and develop strategic projects within the key theme areas it requires an innovative approach to ensure these project ideas are captured and propogated through tailored facilitation and outreach.

The employment of a Fisheries Animateur could be one way to help ensure that community fishing projects are built from the community's base capacity for change and innovation. An animateur could help to span the gap between an applicant's willingness to engage and their ability to navigate a sometimes, heavily bureaucratic process in order to access funding.

8. Recommendations

In order to capitalise on the some of the opportunities highlighted and to address some of the barriers raised the following recommendations are made for consideration as part of an action plan for the SBFLAG for the period 2016 -2020.

8.1 Invest in additional capacity to assist project development and delivery:

The employment of a Fisheries Animateur will ensure that community fishing projects are built from community's base capacity for change and innovation. An animateur provides cohesion, leadership and time in order to develop project into tangible projects on the ground, as a priority these should include:

- Aquaculture development strategy
- Development of an ecological sustainable razorfish fishery
- Undertaking individual training plan for individual fishermen
- Supply-chain networking between producers and restaurants
- Promotion and marketing of Swansea Bay seafood

8.2 Develop a marketing and communication strategy

The FLAG should consider the development of a multi-annual, multi-stakeholder communication strategy. Such a strategy should improve awareness of the FLAG within the wider fishing community and develop public facing materials and activities for the food sector and also the recreational angling sector.

8.3 Invest in infrastructure and capital items (e.g. ice bins)

The need for items such as an ice plant and chiller to provide a chill chain to enhance the quality of local wetfish landings cannot be over stated. This is fundamental as without first providing a quality product any branding or promotion of local fish products could soon be de-valued.

8.4 Expanding the FLAG membership and developing sub-groups

Consideration of expanding FLAG membership to encourage supply chain partners to engaged in FLAG project development and delivery (e.g. processors and restaurateurs). Establishment of theme focused sub-groups should also be considered in the following areas.

8.5 Invest in development of under-utilised fisheries / opportunities

There appears great scope for sustainable economic growth in areas such as razorfish harvesting and seaweed culture and consideration should be given to working with relevant stakeholders to develop key projects in these areas.

Acknowledgments

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We would like to thank Roland Hill and Sean Evans, both of Natural Resources Wales (NRW), who provided insight and expertise that greatly assisted the research, although they may not agree with all of the interpretations of this report.

We would particularly like to thank Dr Andy Woomer, Salacia Marine for providing expert guidance throughout and whose comments greatly improved the manuscript and also to Dai Bulley (MFV "Seapie") for the considerable time he committed to the project.

Annex I - Consultees by sector group

SWBLAG sector interest	Number of consultees
Commercial fishermen	10
Charter angling skippers	3
Tackle shop owners	2
Freshwater anglers	1
Fresh fish shops	4
Fish processors	4
Restaurateurs (and chefs)	8
Fishermen's organisations	2
Fish market operators	2
Shellfish producers	3
Angling representatives	2

Annex II - References & bibliography

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