

Marine Stewardship Council (MSC) Public Certification Report

Cornwall Sardine Fishery

On Behalf of

Cornwall Sardine Management Association (CSMA)

Prepared by

Control Union (UK) Limited

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QA

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FR

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Originator:	H. Jones	06 th July 2022
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Approver:	T. Tsuzaki	10 th July 2022

PCR

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Reviewer:	-	-
Approver:	T. Tsuzaki	8 th August 2022

Executive Summary

This is the report for the reassessment of the Cornwall sardine fishery under the Control Union assessment team comprised of Team Leader and Principle 2 expert Hugh Jones, Principle 1 expert Martin Van Brakel and Principle 3 expert Sophie des Clers. The assessment took place under the [derogation 3](#) MSC in wake of the Covid-19 pandemic using the default tree. The site visit was held in Newlyn, over two days from the 20th January, with remote calls with stakeholders completed on 1st February 2022. The fisheries strengths and weaknesses are detailed below.

Under Principle 1 – The stock underwent benchmark in 2021 by International Council for the Exploration of the Sea (ICES) and is now considered a category 3 stock. The 1st ICES stock assessment under this new designation was produced in December 2021. The stock biomass is shown to be above MSY and fishing mortality is well below F_{MSY} . Catch advice from ICES using a new harvest control rule (HCR) was issued by ICES with the 2021 advice for this stock. However, as a non-quota species there is no associated TAC and there is concern on the appropriateness of the assessment for the ICES HCR, raised by ICES and industry. This concern leads to a condition on PI1.2.4a.

The CSMA is the only fishery which targets the stock on an annual basis and comprises >60% of the annual fishing mortality and in the absence of a stock wide HCR prior to 2022 a joint HCR between the competent authority the UK agency responsible for fisheries science (CEFAS -Centre for Environment, Fisheries and Aquaculture) and the UoA was developed. This HCR and tool (an annual catch limit) has been in-place since 2018 based on advice from CEFAS and updated each year based on new survey information. In 2022 to address the concerns in the ICES HCR and to meet the fishery specific objectives the HCR was redesigned by CEFAS and CSMA and found to be precautionary. This HCR sits within the established objectives of the CSMA harvest strategy and is implemented though a catch limit applied by the CSMA.

Under Principle 2 – the information base for the fishery includes fishery logbooks required under the UK management system and CSMA logbooks which provide further details into the fishery catch. In addition observer reports for the past four years and CCTV coverage help establish the targeted nature of the fishery whilst fishery dependent and independent research help identify the fishery footprint, impact and consequence. During the reassessment process it became clear that the fishery does come in shallow water contact the seabed and therefore the habitats component is scored with reference to this and appropriate UK designations. There remains minor issues in the completeness of CSMA logbooks for ETP and discard species resultant of changes in vessel captains within the fleet, however increased evidence from observer reports and independent research provide significant improvements in data adequacy. All PIs have been assessed to score 80 or above.

Under Principle 3 – The UK left the EU in 2021 and the management adaption of this fishery is reviewed and accounted for in this report. The responsibilities of the UK national management system is well established, and EU regulations (Habitat and Birds Directives for example) have been transposed in UK legislation. The Specialised Committee on Fisheries committee that follows the agreement between the UK and the EU has not yet agreed specific catch shares of non-quota species for EU vessels, including of the subdivision 7 sardine stock. Until this is done at the EU-UK level, the fisheries Principle 1 objective is dependent on measures decided by the CSMA and agreed by the Cornwall IFCA, through their fishery management plan. There is no evidence of systematic non-compliance within the fishery.

Following consideration of all stakeholders' inputs and comments at the site visit, Peer review stage and the Public Comment Draft Report (PCDR), the fishery assessment team concluded that the fishery

should continue to be certified against the MSC standard with a single condition in Principle 1 on HCR appropriateness from the stock assessment.

1 Report Details

1.1 Authorship and Peer Reviewers

Name	Dr Hugh Jones
Areas of responsibility	Team Leader and Principle 2 assessor
Competency criteria (Annex PC)	<p>Dr Hugh Jones has a PhD in Ecotoxicology and strong background in marine research including publications and reports on ecotoxicology, environmental risk assessments and fisheries research. Prior to joining CU UK, he was employed as a fisheries scientist in the development of an empirical harvest strategy for commercial abalone fisheries and fisheries assessments of estuarine bivalves. This included work on population metrics (recruitment, growth), harvest dynamics (catch rates, market selectivity), and the use of fine scale geospatial techniques as performance measures to assess stock sustainability.</p> <p>Hugh has published peer reviewed works on the trophic pathways of estuarine food webs and prey abundance in relation to environmental conditions. His work includes analysis of benthic abiotic and biotic attributes which determine the functional ecology of fish species. He has secured research funding for ecological studies of fish populations in relation to climate change, which consider the coupling between demersal and pelagic pathways. He has published research reports into the spatial variability of recruitment of commercially fished benthic species and its impact on community dynamics.</p> <p>Hugh has been a Principle 2 assessor for MSC certifications since 2016.</p> <p>Hugh has completed the required Fishery Team Leader MSC training modules for the V2.01 Fisheries Certification and V2.2 process requirements. Based on the above experience CU UK is confident that Hugh meets the 3-year competency requirement for Principle 2 experience.</p>
Conflict of interest in relation to this fishery	No conflict of interest has been identified for this fishery
CV	CV available on request

Name	Martin Van Brakel
Areas of responsibility	Principle 1
Competency criteria (Annex PC)	<p>Martin has over 5 years experience with stock assessment of coastal small pelagic species based on length-based or length converted cohort analysis using data available from commercial fisheries, in particular <i>Decapterus macarellus</i> (scad mackerel) stocks in Cape Verde (1997 – 1999) and <i>Tenualosa ilisha</i> (hilsa shad) in Bangladesh (2015 – 2017)</p> <p>It is proposed that Martin would have primary responsibility for Principle 1. The qualifications listed above provide Martin with the appropriate skills to meet competency criteria PC3.1 and 2. He has completed MSC training modules for V2.01 Fisheries Certification Requirements.</p>
Conflict of interest in relation to this fishery	No conflict of interest has been identified for this fishery
CV	CV available on request

Name	Dr Sophie des Clers
Areas of responsibility	Principle 3
Competency criteria (Annex PC)	Dr Sophie des Clers is an independent expert in fisheries management and socioeconomics, is an independent scientific consultant in fisheries management and socioeconomics. She holds a PhD in Biometrics from Lyon University (France) applied to fish population dynamics and an MSc degree in Public Policy from University College London (UK). Sophie provides fisheries management, policy and strategic business expertise at an international, national and local level. It is proposed that Sophie would have primary responsibility for Principle 3. The qualifications listed above provide Sophie with the appropriate skills to meet competency criteria PC3.4. She has completed MSC training modules for V2.01 Fisheries Certification Requirements.
Conflict of interest in relation to this fishery	No conflict of interest has been identified for this fishery
CV	CV available on request

Peer Reviewers:

The MSC Peer Review College compiled a shortlist of potential peer reviewers to undertake the peer review for this fishery. The two peer reviewers selected from the list were Gudrun Gaudian and Neil Campbell. Peer reviewer competency and biographies can be viewed on the assessment downloads page on the MSC website.

1.2 Version details

The default assessment tree was used throughout this reassessment.

Table 1. Fisheries programme documents versions

Document	Version number
MSC Fisheries Certification Process	Version 2.2
MSC Fisheries Standard	Version 2.01
MSC General Certification Requirements	Version 2.4.1
MSC Reporting Template	Version 1.2

2 Unit(s) of Assessment and Certification

2.1 Unit(s) of Assessment (UoA)

CU UK confirms that the fishery under assessment is within the scope of the MSC Fisheries Standard (7.4 and 7.5 of the MSC Fisheries Certification Process v2.2):

- The target species is not an amphibian, reptile, bird or mammal (FCP v2.2. 7.4.2.1);
- The fishery does not use poisons or explosives (FCP v2.2 7.4.2.2);
- The fishery is not conducted under a controversial unilateral exemption to an international agreement (FCP v2.2 7.4.2.3);
- The client or client group does not include an entity that has been successfully prosecuted for a forced or child labour violation in the last 2 years (FCP v2.2. 7.4.2.4);
- The client or client group has not been prosecuted for shark finning in the last 2 years (FCP v2.2 7.4.2.10);
- The fishery has in place a mechanism for resolving disputes, and disputes do not overwhelm the fishery (FCP v2.2 7.4.2.11 and 7.4.2.11iii);
- The fishery is not an enhanced fishery (MSC FCP v2.2 7.4.2.12); and
- The fishery is not an introduced species-based fishery (ISBF) (MSC FCP v2.2 7.4.2.13).

CU UK confirms that the client group has submitted the completed ‘Certificate Holder Forced and Child Labour Policies, Practices and Measures Template’ prior to the start of this assessment.

The proposed Unit of Assessment (UoA) is given in Table 2.

Table 2. Unit(s) of Assessment (UoA)

Species	Sardine (<i>Sardina pilchardus</i>)
Geographical range of the fishery	FAO area 27 ICES Divisions 7e and f
Fishing gear	Ring nets (purse seine)
Stock	Sardine (<i>Sardina pilchardus</i>) in Subarea 7 (Southern Celtic Seas, and the English Channel)
Management System/s	Cornish Sardine Management Association (CSMA), operating under laws of the United Kingdom and under the fishery agreement with the European Union.
Client group	Cornish Sardine Management Association (CSMA)
Other Eligible Fishers	None

2.2 Unit(s) of Certification (UoC)

The UoA is the UoC as per Table 2.

3 Assessment results overview

3.1 Determination, formal conclusion and agreement

Following consideration of all stakeholders' inputs and comments at the site visit, Peer review stage and the Public Comment Draft Report (PCDR), the fishery assessment team concluded at the Final Draft Report (FDR) that the fishery should continue to be certified against the MSC standard.

The CU UK Certification Decision Making entity was informed of the recommendation to certify the fishery and the final certification decision was approved after the MSC Disputes Process completed on the 5th August 2022.

3.2 Principle level scores

Table 3. Principle level scores

Principle	Score
	UoA 1
Principle 1 – Target Species	80.8
Principle 2 – Ecosystem Impacts	86.3
Principle 3 – Management System	92.3

3.3 Summary of conditions

Table 4. Summary of new conditions

Condition number	Condition	Performance Indicator (PI)	Deadline	Exceptional Circumstances?	Carried over from Pervious Certificate?	Related to previous condition?
1	By Year 4 the fishery should ensure that the the stock assessment and subsequent advice from ICES is appropriate for the harvest control rule.	1.2.4	Year 4	No	No	no

3.4 Recommendations

None

4 Scoring

4.1 Summary of Performance Indicator level scores

Table 5. Principle level scores

Principle	Score
	UoA 1
Principle 1 – Target Species	80.8
Principle 2 – Ecosystem Impacts	86.3
Principle 3 – Management System	92.3

Table 6. Performance Indicator scores; scores below 80 are shown in yellow

Principle	Component	Wt	Performance Indicator (PI)		Wt	Score
			Code	Description		
One	Outcome	0.33	1.1.1	Stock status	0.5	80
			1.1.2	Stock rebuilding	0.5	N/A
	Management	0.67	1.2.1	Harvest strategy	0.25	90
			1.2.2	Harvest control rules & tools	0.25	80
			1.2.3	Information & monitoring	0.25	80
		1.2.4	Assessment of stock status	0.25	75	
Two	Primary species	0.2	2.1.1	Outcome	0.33	100
			2.1.2	Management strategy	0.33	90
			2.1.3	Information/Monitoring	0.33	85
	Secondary species	0.2	2.2.1	Outcome	0.33	80
			2.2.2	Management strategy	0.33	90
			2.2.3	Information/Monitoring	0.33	80
	ETP species	0.2	2.3.1	Outcome	0.33	80
			2.3.2	Management strategy	0.33	85
			2.3.3	Information strategy	0.33	80
	Habitats	0.2	2.4.1	Outcome	0.33	100
			2.4.2	Management strategy	0.33	85
			2.4.3	Information	0.33	80
	Ecosystem	0.2	2.5.1	Outcome	0.33	100
2.5.2			Management	0.33	80	
2.5.3			Information	0.33	80	
Three	Governance and policy	0.5	3.1.1	Legal &/or customary framework	0.33	85
			3.1.2	Consultation, roles & responsibilities	0.33	95

Principle	Component	Wt	Performance Indicator (PI)		Wt	Score
			3.1.3	Long term objectives	0.33	100
	Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.25	80
			3.2.2	Decision making processes	0.25	100
			3.2.3	Compliance & enforcement	0.25	95
			3.2.4	Monitoring & management performance evaluation	0.25	90

4.2 Fishery overview

4.2.1 The Client fishery

Table 7 contains the vessel list of the UoA, vessel lengths and home ports. There are three ports used by the fleet Mevagissey, Newlyn and Plymouth. All vessels are under 15 m in length and well under the 18.28 m required by the Cornwall Inshore fisheries and Conservation Authority (CIFCA) bylaw (CIFCA n.d.). One of the three vessels based in Plymouth (Charlotte Clare) is as of 2021 fishing from Newlyn.

All vessels are licenced under the Marine Management Organisation (MMO). Over 10 m vessels fall within the Category A (Pelagic) group, whilst the 10 metre and under vessels - non-sector (<https://www.gov.uk/guidance/understand-your-fishing-vessel-licence#fishing-vessel-licences-over-10-metre-vessels---category-a-pelagic>)

Table 7. Vessel list 2021. Note vessels Nicola May and Celtic Dawn did not fish the UoA in 2020 but remain part of the UoA. * This is the tugboat for Galwad-Y-Mor, used to close the purse seine and for manoeuvring in the dock. She is also used to assist in transport of fish from Galwad-Y-Mor to dock.

Vessel name	Home port	Operator		Vessel length (metres)	Port letter number
Pelagic Marksman	Newlyn	Stefan Glinski Mark Powell (new owner August 21)		14.96	SS774
Lyonesse	Newlyn	Sam Lamborne		11.99	PZ81
Galwad-y-Mor	Mevagissey	Peter Blamey		11.89	FH76
Resolute	Mevagissey	Nick Hitchens	Oceanfish	9.34	FY119
Mayflower	Newlyn	James Roberts		14.0	PZ181
Asthore	Newlyn	James Round		14.95	PZ182
Charlotte Clare	Plymouth	Thomas Pascoe	Interfish	14.95	PH660
Rachel Ann	Plymouth	Richard Chamberlain		14.95	PH770
Nicola May	Plymouth	Jordan Kay		14.98	PZ660
Celtic Dawn	Mevagissey	John Hunkin		13.45	FY10
Serene Dawn	Newlyn	David Pascoe		11.86	PW156
Golden Harvest	Newlyn	Danny Downing		14.90	PZ63
Pride of Cornwall	Newlyn	Danny Downing		9.90	SS87
Vesta	Newlyn	Peter Bullock		14.95	PZ183
Rachel Girl*	Mevagissey	Peter Blamey		9.95	PW77

4.2.2 Gear and operation of the fishery

Sardine (pilchard) fishing in Cornwall, England has been taking place for over 400 years but declined significantly until the 1990s when the pioneering of the ring netting technique (small purse seines) rejuvenated the fishery into what has become today. The ring nets (purse seines) are based on traditional ring netting techniques and methods used worldwide to target nearshore small pelagic species and are regarded as having a low environmental impact and minimal bycatch. The nets incorporate a floated head-line at the surface to encircle the shoal of fish, and a weighted base of the

net is drawn in like a purse string to trap the fish (Figure 1). The mesh size used by the fishery is on average 21 mm with some operators operating slightly larger mesh, greater than the legal requirement of 16 mm (HM 2019). The ring net lengths vary by vessel with the largest vessels (14.99 m) operating head line lengths of 440 m whilst the smallest vessels (10 m) head lengths are 235 m (Rodríguez-Climent et al. 2021). Figure 2 provides a diagrammatic view of a typical CSMA ring net in 2020.

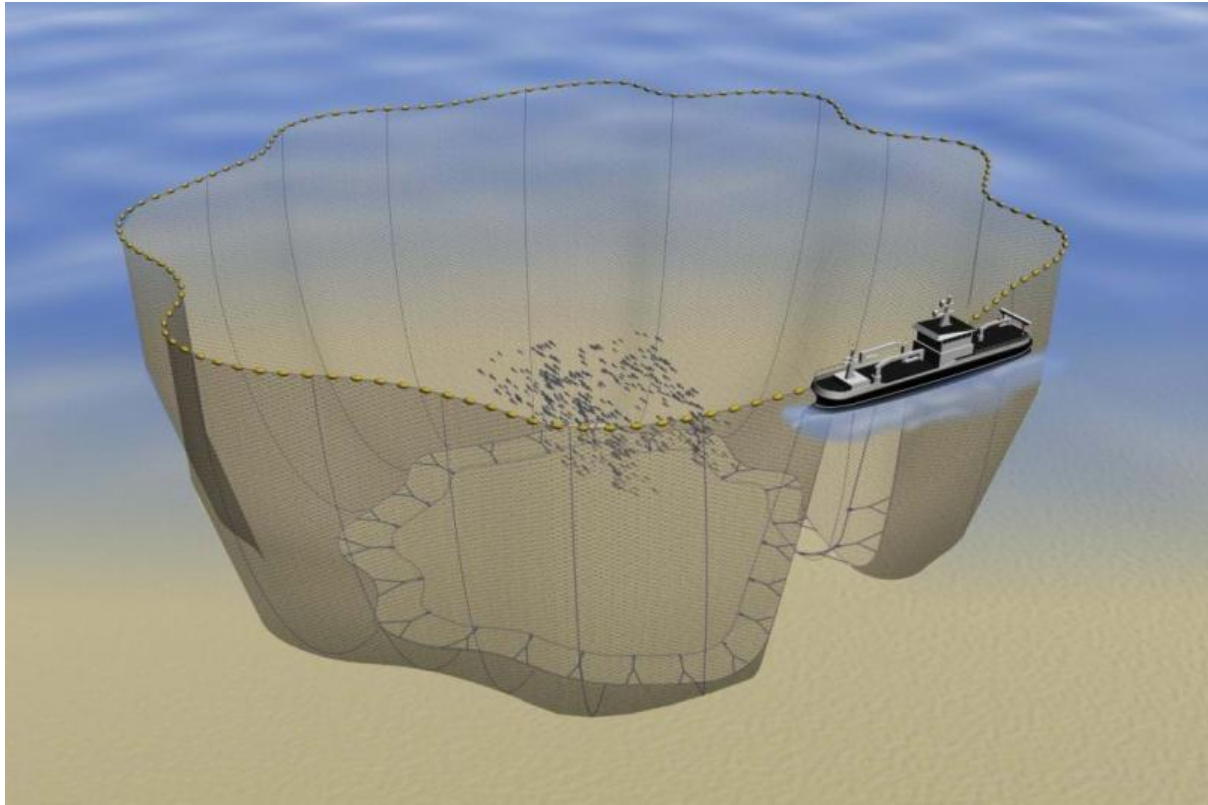


Figure 1. Stock image of a purse seine (ring net). Source: Seafish (<https://www.seafish.org/responsible-sourcing/fishing-gear-database/gear/ps-purse-seine/>)

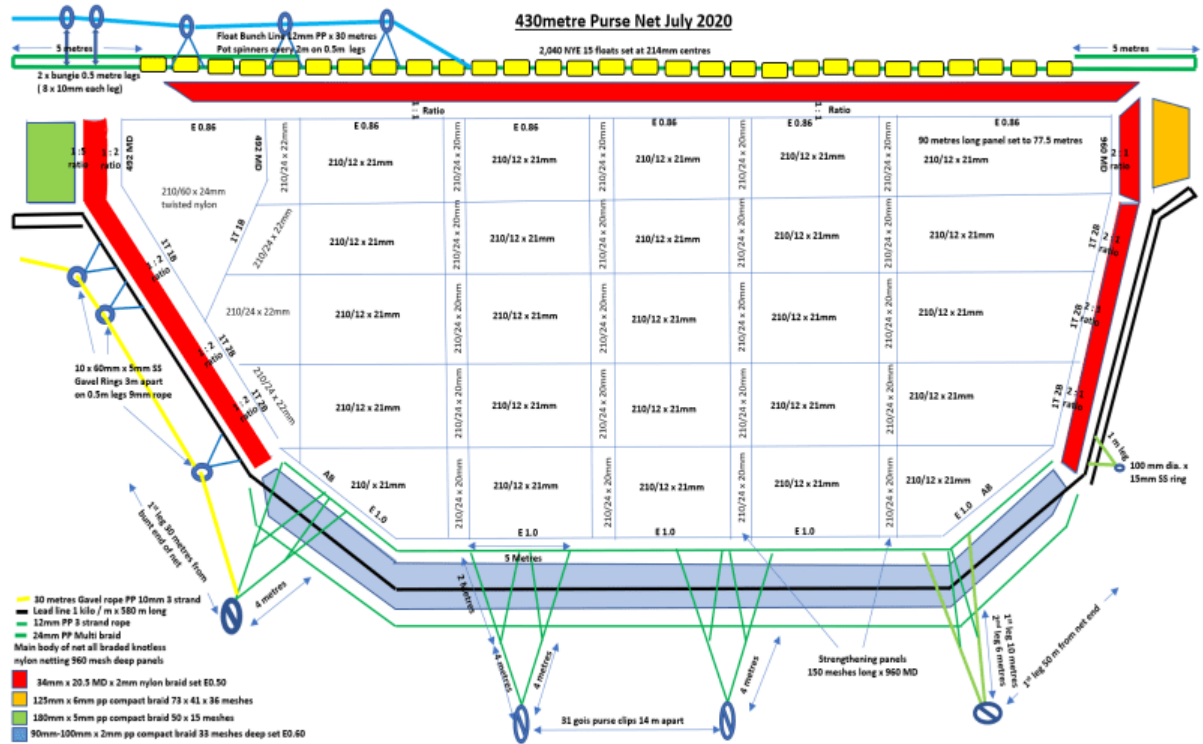


Figure 2. schematic diagram of a 430 m purse seine net (ring net) used by the CSMA fleet. Source: CSMA.

The fishery operates in depth between 0 m and ~70 m with the highest CPUEs in the shallower areas and deeper areas of the fishery with an average depth of 50 m (Stanton 2021) (Figure 3). Ring nets are not generally associated with seabed damage as they are designed for use in midwater and contact with any seabed other than flat soft sediment will lead to snagging, tearing of the net and endangerment to the vessel and crew. If used in water shallower than the depth of the net, the captain must be certain of the seabed type as drawing in the footrope has the potential to inflict abrasion / dragging damage on the surface of seabed habitats.

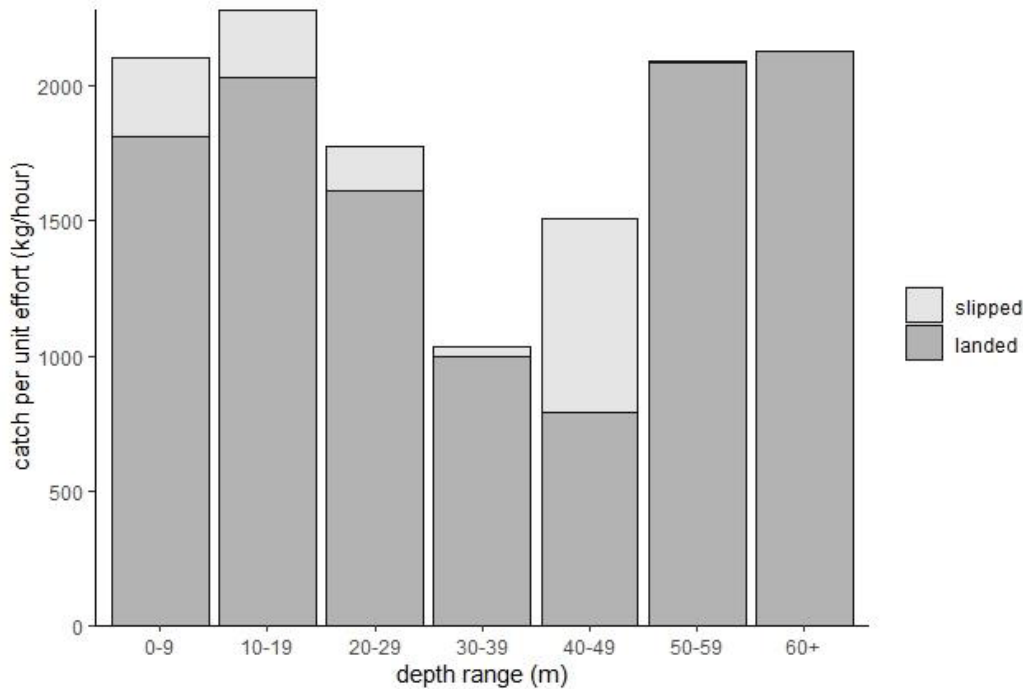


Figure 3. 2019 Total CPUE across 10m depth ranges. Highest CPUE occurs in the shallower and deeper depth ranges, with lower values at the mid-range. Quantity of slipped fish varies across depths <49m but is virtually non-existent in depths >50m. Slippage is a method of reducing unwanted catch whilst lowering mortality rates it is discussed under section 6.2.2.2 of this report. Source: (Stanton 2021).

A typical CSMA trip from Newlyn operates in the following manner. The vessel will leave dock prior to dusk or dawn and will motor to the outside of Mounts Bay whilst using sonar and depth sounders to locate aggregations of sardine (Figure 4). Once located the vessel will, if the water is deep enough deploy the net and encircle the whole or part of the school depending on size and requirements from the buyer. If the depth is shallow and there is any chance of the net dragging the skipper of the vessel will follow the sardines until they are located over sand / sediment before deploying the net. This is judged from sounder profiles of the bottom type, skipper experience, and electronic marine charts onboard. Once encircled the net is pursed and the catch brought to the side of the vessel. At this point the skipper will make a judgement on the size and catch composition of the catch. If too much is in the net the vessel will slip catch in accordance with CSMA procedures or share catch (see section 6.2.2.3 of this report) (Figure 5). The catch is brought aboard the vessel via pump or braille (Figure 6 and Figure 7) and stored in either integrated well tanks or insulated transport bulk boxes (see Traceability section 5.2).

A third party video of a CSMA vessel morning catch including a slippage event and catch share is available online <https://www.youtube.com/watch?v=SC-hKsJDqaM&t=1s> , shot 28th Dec 2021 (source: www.log.through-the-gaps.co.uk).

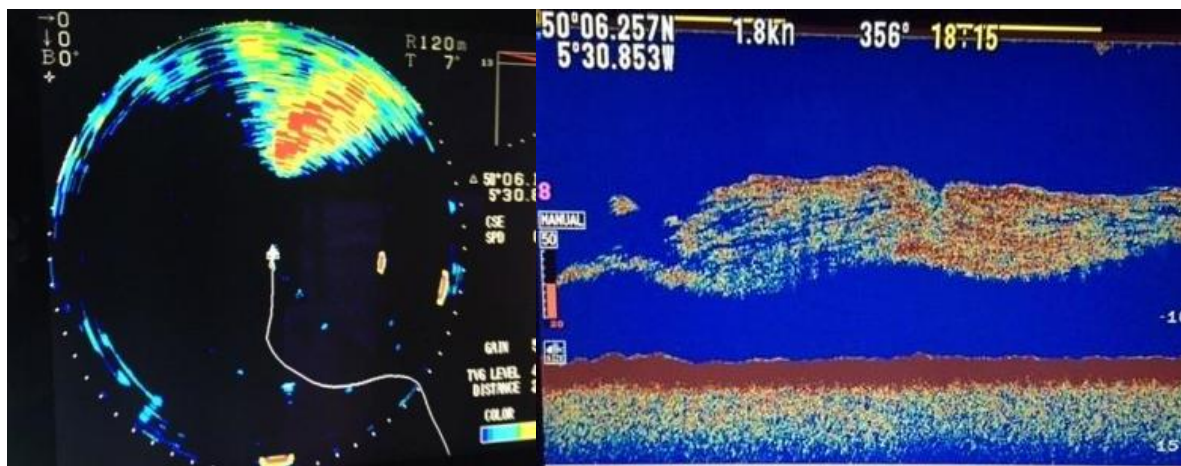


Figure 4. Vessel sonar showing sardine aggregation ahead of the vessel and depth sounder also showing the same aggregation. Source CU UK.



Figure 5. Sharing the catch between two CSMA vessels. Source: www.log.through-the-gaps.co.uk



Figure 6. Pumping the catch aboard a CSMA vessel into the vessel integrated holds. Source: CU UK.



Figure 7. the alternative system to pumping the catch is brailling the catch aboard the vessel. This may be used at the end of the catch process to clean the small reminder of fish in the net. Source: CU UK.

4.2.3 Fishing areas and seasons.

The fishery is seasonal operating from early autumn (August - September) through to April, with the fish in best condition in the autumn – early winter period and when most catch is taken (Figure 8). Recent years have seen a minor interest in daylight shots by the fleet, although overall the fishery remains an overnight fishery.

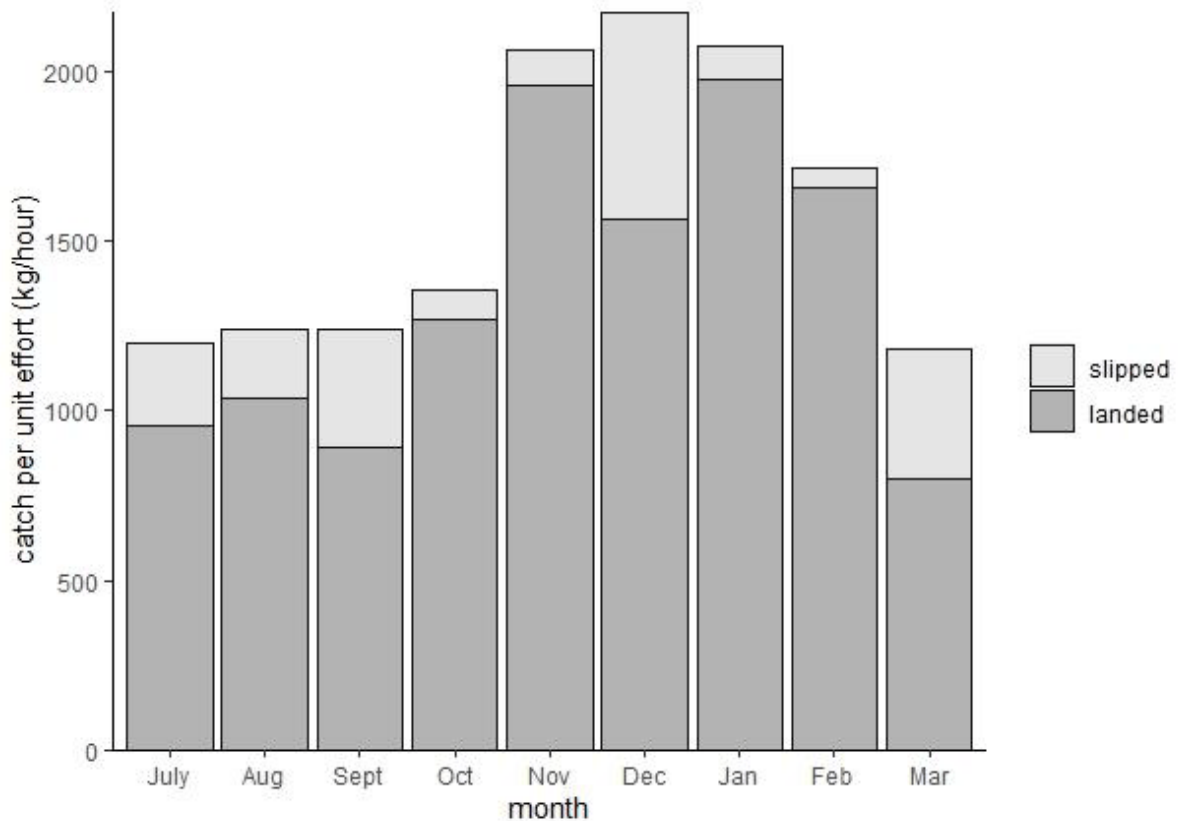


Figure 8. Annual catch profile of the CSMA fishery with catch per unit effort by month for 2019. Slippage is a method of reducing unwanted catch whilst lowering mortality rates it is discussed under section 6.2.2.2 of this report. Source: CSMA and (Stanton 2021)

The stock distribution area is depicted in Figure 9 based on the Pelagic Ecosystem Survey in the Western Channel and Celtic Sea (PELTIC) surveys undertaken by Centre for Environment, Fisheries and Aquaculture (CEFAS) each year (CEFAS 2020b). This stock distribution is contained entirely within ICES Subarea 7. The UoA operates exclusively within the 12 nm limit of the Cornish coastline and the fishery footprint is examined in section 6.2.6.3 of this report. Between 0 - 6nm of the UK coastline the fishery is under the jurisdictional management of the Association of Inshore Fisheries and Conservation Authorities (IFCA). For this UoA, this is Cornwall IFCA and Devon and Severn IFCA. Between 6-12 nm, it is the Marine Management Organisation (MMO) that holds jurisdictional responsibility.

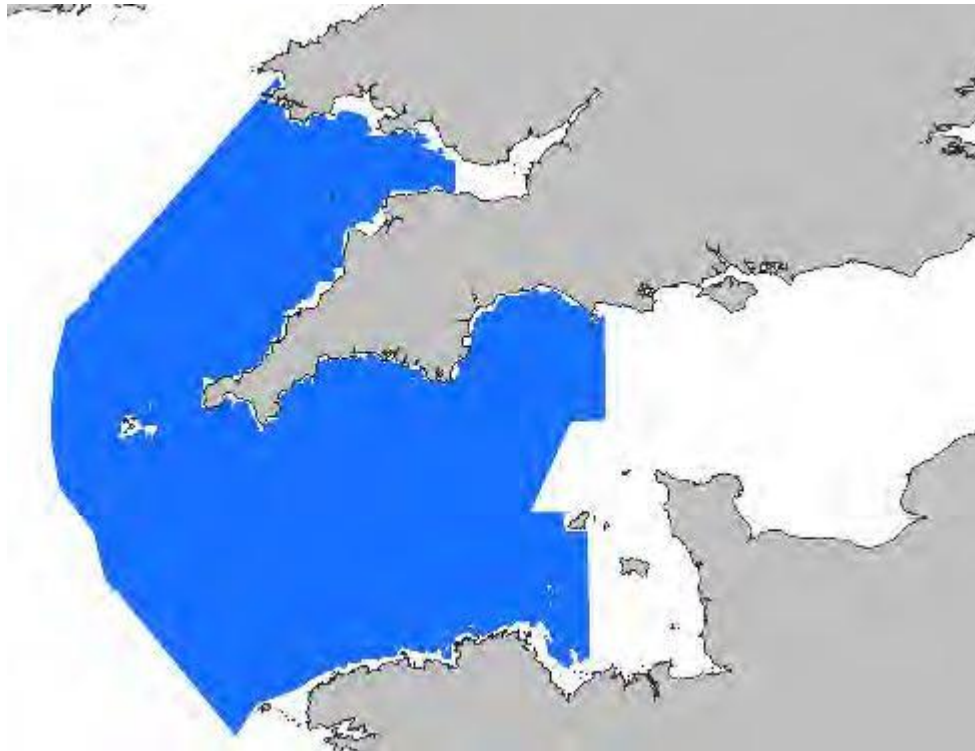
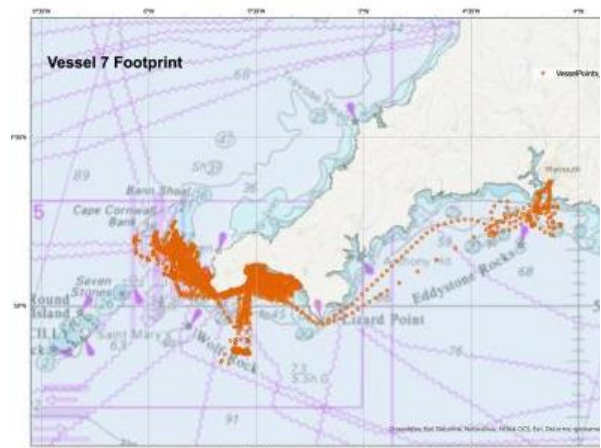
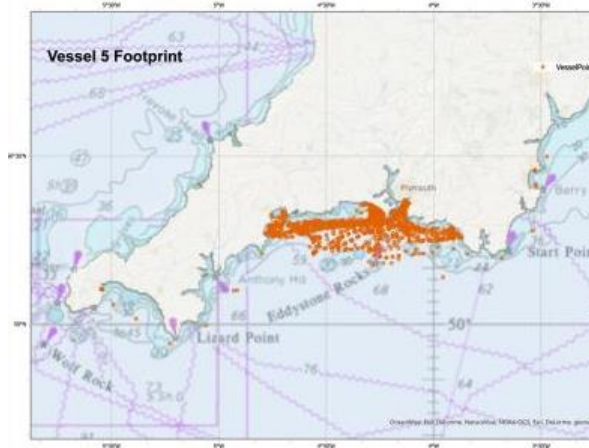
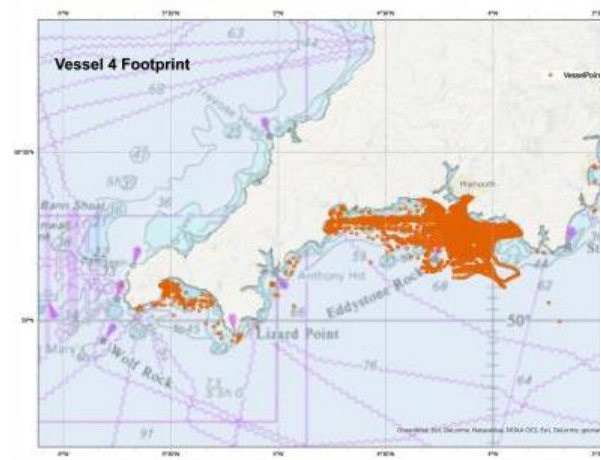
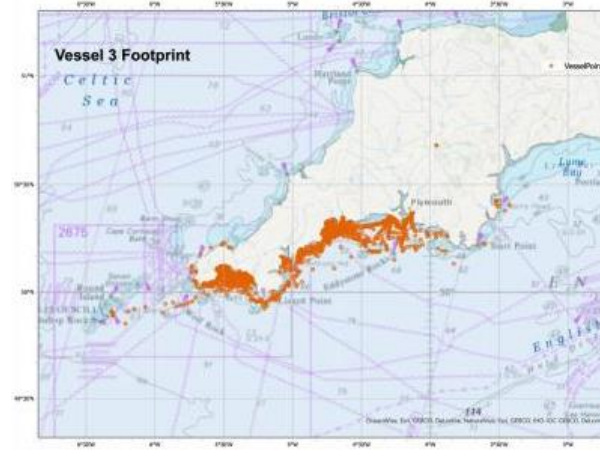
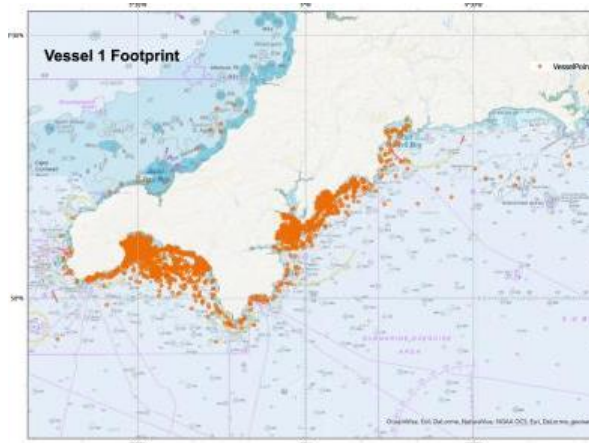


Figure 9. The total stock area as depicted in the fishery independent survey (PELTIC) underpinning the stock assessment. Source (ICES 2021a).

The fishing vessels operate entirely within 12 nautical miles of the coastal baseline in territorial waters of the Cornwall and Devon IFCA districts in bays where the sardines congregate, mostly on the South coast and western tip of Cornwall (Figure 10).



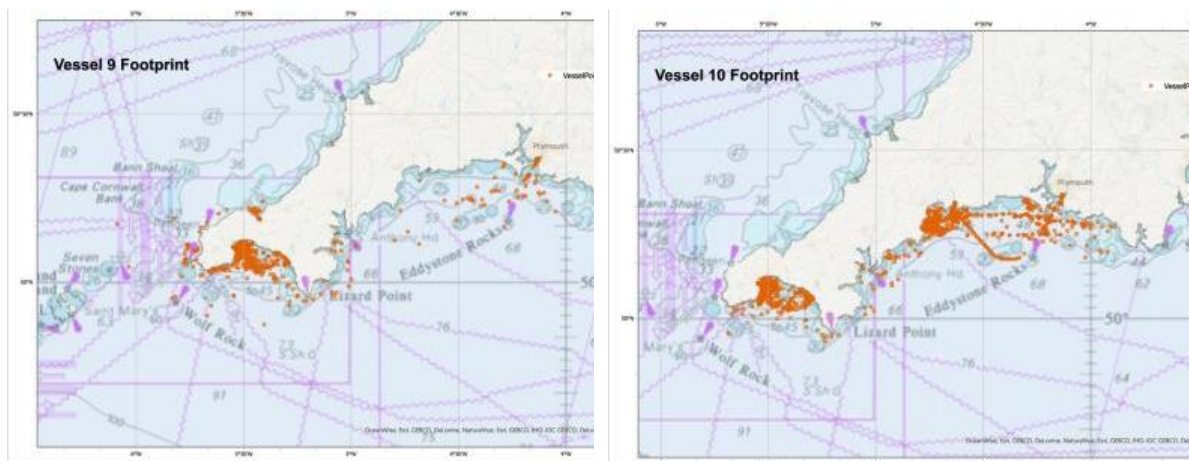


Figure 10. VMS tracks of eight of the CSMA fleet between 2018-2020. The tracks are not filtered by fishing events and therefore include transits pings. Source MMO data mapped by Seafish.

4.2.4 Catch profiles and data availability

Reported catches for the stock are available by national reporting for each of the European states and are summarised in the 2021 benchmark on the stock (ICES 2021a). That report concluded that although sardine is a target for some fleets (including this UoA, which takes the majority of the catch), some fleets are more opportunistic, and only target sardine (a non-quota species) if it is plentiful and when abundance or the quota of their main target species is low (ICES 2021a). A recent history of the catches by each nation is shown in Table 8.

Table 8. Sardine in Subarea 7. History of reported landings; values are presented for each country participating in the fishery. All weights are in tonnes. Recreated from (ICES 2021a) and ICES (2021d). UK average percentage over the period equal to 63.2%.

Year	FR	UK	NLD	IRE	GER	DEN	LIT	BEL	ESP	Total	UK %
2011	508	3,604	513	983	22	3	0	0	0	5,633	64.0
2012	444	4,423	1,439	8	0	0	0	0	0	6,314	70.1
2013	1,768	3,722	1,804	236	214	40	0	0	0	7,784	47.8
2014	1,202	3,889	249	0	18	953	0	0	0	6,311	61.6
2015	1,040	4,293	1,137	380	1,551	1,011	1	0	0	9,413	45.6
2016	863	9,389	4,697	232	1,941	2,286	0	1	0	19,409	48.4
2017	726	7,623	1,349	140	1,095	2,459	0	0	0	13,392	56.9
2018	663	8,143	811	44	490	263	0	0	0	10,414	78.2
2019	671	7,049	90	33	53	0	40	0	0	7,936	88.8
2020	592	9,500	185	58	0	3,217	0	0	0	13,552	70.1

Records of landed catch of sardine and overall catch composition from the UoA are available from the CSMA vessel logbooks (Figure 11). Landed catch of sardine are also produced by processor records and for the UK as a whole in the MMO record (MMO 2019). According to the latest records the CSMA landed 6,386 t of the catch limit of 10,048 t (63.7%). This accounted for 92% of UK landings according to MMO records in 2019 (UK national landings = 6,976 t) (MMO 2019).

Vessel Name		SEASON 2021/2022		Please use one line every time the net is shot. If you do not catch any fish still note the date, shoot and haul times. Please ensure you record any bird, seal, cetacean or Tuna bycatch (put 0 if no bycatch). Record any shared catches in the comments box. PLEASE FILL IN ALL BOXES EVEN IF ZERO													
Skipper				WEIGHT OF FISH IN KG'S (RETAINED)				BYCATCH Landed in Kg's	Estimate of Weight in Kg's of Slipped or Discards fish		TIME		BYCATCH				S A M P L E
DATE	LAT LON	Depth of Fish	SARDINES	ANCHOVY	MACKEREL	SCAD	Other Species & Kg's	SLIPPED ALIVE Kg's & species	DISCARDED DEAD Kg's & species	Shooting times	Hrs at Sea	Birds	Seals	Dolphins	Tuna	COMMENTS	

Figure 11. Example Logbook for the CSMA for season 2021. Source: CSMA.

On-board scientific observer data are available from the fleet in 2018 (SMRU 2018) and 2019 (SMRU 2019) approximating 2% of trips, but no observers were onboard in 2020 due to Covid-19 restrictions. There are also sporadic observer data from before 2017. These data and the implications are discussed under section 6.2.2.4.

4.2.5 Future developments

4.2.5.1 Catch app

Logbooks illustrated in Figure 11 are currently completed in paper form and submitted to the CSMA and MMO. In order to develop a more efficient system, a mobile phone application (app) was developed in collaboration with AST Marine Sciences Limited (<https://www.theastgroup.com/uk/>), the fishers, the CSMA and Cefas in 2019-2020, under the Fisheries Science Partnership (FSP) project. The main aim was to trial an innovative electronic (paper-free) data recording method, that would improve the monitoring of small pelagic fish in the Southwest of England by reducing the errors associated with manual data input. This is an important step for the pelagic sampling programme to run autonomously, by continuing to contribute reliable fisheries-dependent data to the assessment process for the sardine stock without the need for Cefas staff to convert logbooks to datasets.

The development of the phone app was logistically challenging during Covid-19 restrictions and was characterised by a succession of delays. However, two CSMA vessels took part in a trial phase in 2021 and have reported back to the developers. The next phase of the app development will adopt some of these recommendations and potentially include pictures of the bycatch species that can sometimes be captured by the fishery (mammals, turtles, birds, tuna, etc.) (Rodríguez-Climent et al. 2021) (Figure 12).

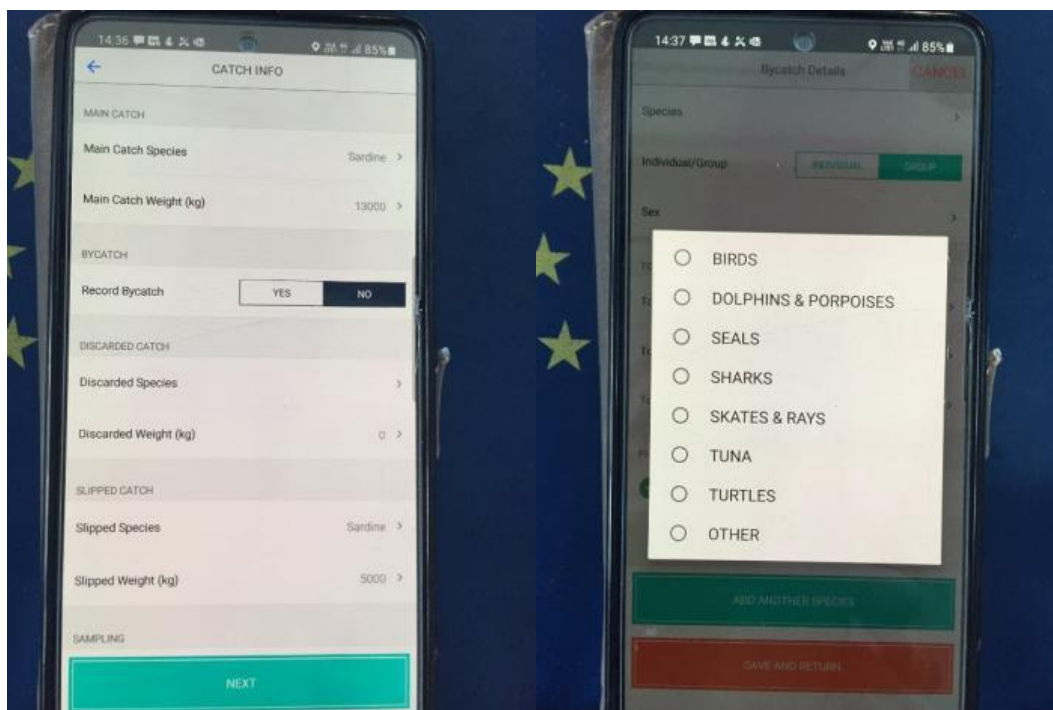


Figure 12. Screen shots of the catch app. Showing ability to record catch, slippage and discard information (left) and ETP interaction (right). Source CU UK.

4.2.5.2 Temperature and pressure tags

A single temperature and pressure tag was trialled on one of the CSMA vessels in 2020/2021 for 70 days as a pilot to allow consideration of effort within the fishery (pressure data when net is in the water) and temperature. The trial was successful and the intent is for further trials in 2021/2022 (Rodríguez-Climent et al. 2021).

5 Traceability and eligibility

5.1 Eligibility date

The UoA is currently certified under certificate code MSC-F-31296 which expires 28th August 2022. The eligibility date for this reassessment been set as the date of the PCR publication, pending the successful outcome of this evaluation. Product caught by CSMA members using the methods outlined in the UoA will be eligible to enter further chains of custody from this point forward.

5.2 Traceability within the fishery

Fishing activities take place overnight with occasional day shoots. Each boat catches to order from one of the four processors of the fishery. The maximum catch weight varies across the fleet from 12 t to 40 t, however the maximum catches are rarely taken because of processor handling capacity and therefore 15 t is considered a fleet wide average maximum. Vessels will typically leave port prior to dusk and using side scanning sonar and sounders will locate 'marks' of sardine schools. The nets are set on the 'marks' (shoals of sardine) detected by sonar provided the water is deep enough not to interact with the seabed or once the shoal of fish is over sand and not rock. Once the net is shot and the fish encircled, if deemed the right species and size, the fish are hauled onboard using braille or pump. They are placed straight into the hold, which contains iced seawater. This keeps the catch fresh until landing.

All vessels are required by legislation to complete logbooks in either electronic form (over 12 m) or paper form (under 12 m) at present (note a mobile app development in section 4.2.5.1 is also being trialled). In addition CSMA members complete the CSMA logbook. CSMA members are required to complete logbooks whilst on the fishing vessels, information including tonnage, date, location, and depth caught, fishing methods, and any non-target species caught is recorded (Figure 11). This information is collected by the CSMA for recording on to their databases. It is a requirement of the CSMA to ensure that skippers and owners record and submit details of the catch to CSMA. Without completed logbooks to confirm fishing location, the landed catch is not eligible to be stated as MSC. Official logbook information is reported to the Marine Management Organisation (MMO). At first point of sale, all processors record the actual catch weight, date and vessel details, allowing tracing back to the vessels. All catch taken to processing units is also recorded through the use of sales notes, which must be submitted within 48 hours by the registered buyer for all commercially sold fish, irrespective of vessel length as per the UK Registration of Fish Buyers and Sellers (RBS) Regulation 2005¹. Details required to be provided on a sales note include the details of the vessel, port and date of landing and the name of the vessel master or owner. This can be verified against the vessel list from the client group. The CSMA then gathers this information to crosscheck the estimated volumes on the logbooks, with the actual volume landed and sold.

¹ <https://www.legislation.gov.uk/ukxi/2005/1605/contents/made>

The fish stock is concentrated within the UoC, and fishers do not fish outside of the UoC, as the UoC encompasses all of ICES Divisions 7e and f. The stock does extend beyond 7e and 7f into the remainder of Subarea 7 but the UoC does not fish there. There is little to no chance of sardines outside of the UoC being landed as MSC certified, because the fish are landed directly to processing facilities with the above documentation when sold. This is the first change of ownership. Date of capture, as well as vessel name and location act as traceability going forward into subsequent chains of custody. Cornish sardine is a geographical origin registered trademark (with Defra), which is verified by Cornwall Council Public Health & Protection:

<https://assets.publishing.service.gov.uk/media/5fd349588fa8f54d61af6d2d/cornish-sardines.pdf>

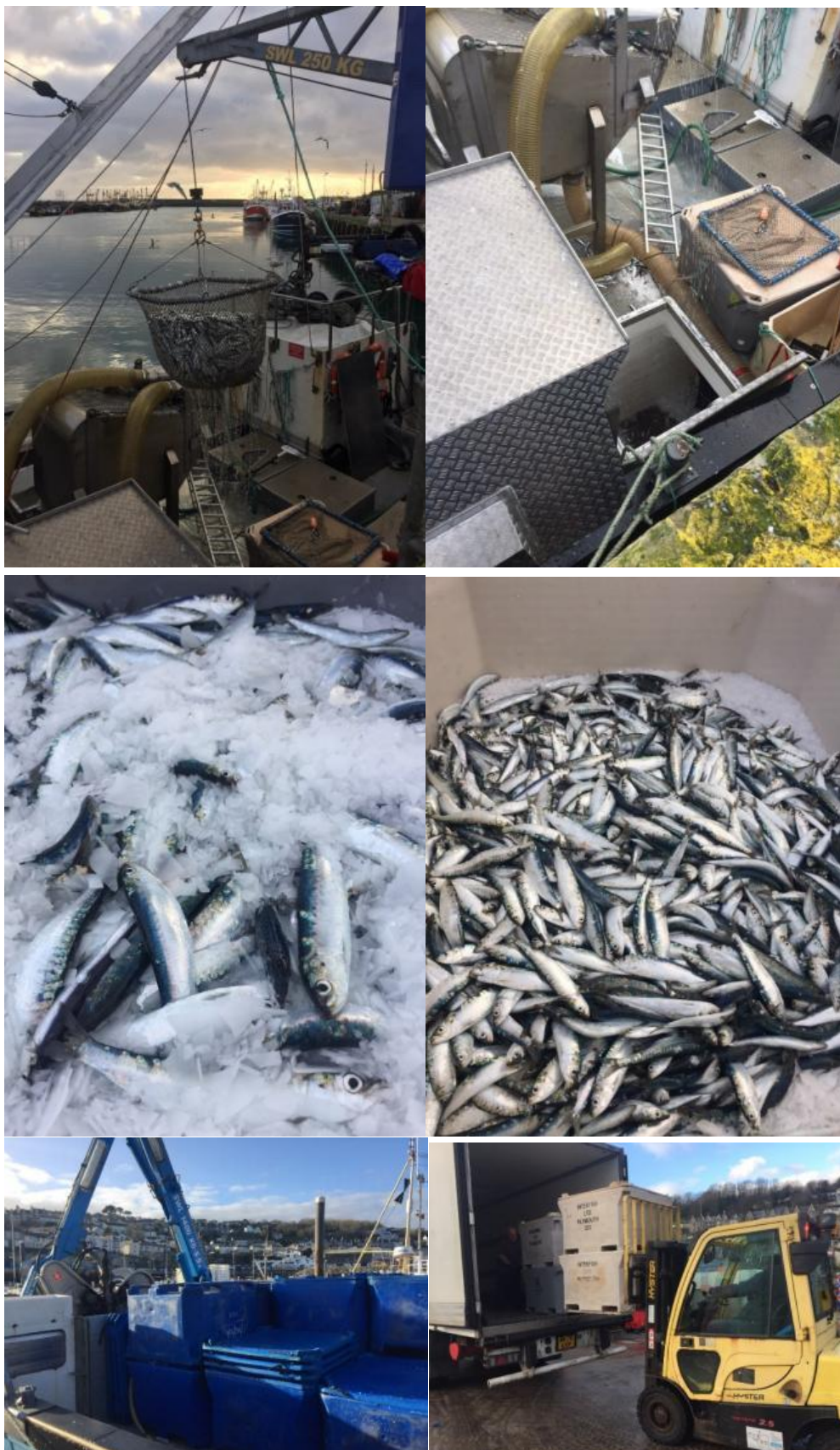


Figure 13. A CSMA vessel unloading sardines at Newlyn, Cornwall, UK. Images show net haulage from integrated vessel tank (top row), iced catch within transport bins (middle) and transport bins on a CSMA vessel without integrated storage (bottom left), loading a refrigerated trailer at the port (bottom right). Source: CU UK.

Table 9. Traceability within the fishery

Factor	Description
<p>Will the fishery use gears that are not part of the Unit of Certification (UoC)?</p> <p>If Yes, please describe: If this may occur on the same trip, on the same vessels, or during the same season; How any risks are mitigated.</p>	<p>Low risk. The vessels are only permitted to carry a single gear type at any one time and are subject to inspection by the IFCA's and MMO. Ring net is the most effective fishing method to catch sardine and there is no incentive to try alternatives.</p>
<p>Will vessels in the UoC also fish outside the UoC geographic area?</p> <p>If Yes, please describe: If this may occur on the same trip; How any risks are mitigated.</p>	<p>Low risk. There is no evidence of the fishery operating outside of the UoA. The fishery footprint is known and as the stock is wider than the fishery footprint fishing outside the UoA is highly unlikely.</p>
<p>Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities.</p> <p>Transport Storage Processing Landing Auction</p> <p>If Yes, please describe how any risks are mitigated.</p>	<p>Low risk. If assessed to pass the MSC sardine will be the only certified stock in the certificate. The only other products handled by the fishery are non-certified stocks caught as by catch. Substitution with other small pelagics is not an issue due to the physical differences in the species.</p> <p>There is not a risk of mixing certified and non-certified catch as CSMA vessels land directly at the processors (at authorised points of landing, Newlyn, Mevagissey and Plymouth) directly from their fishing trips, as mentioned above. All catch into processing units is recorded (as required by EC No 1224/2009) through the use of sales notes. These must be submitted within 48 hours of sale by the registered buyer for all commercially sold fish, irrespective of vessel length. Details required to be provided on a sales note include the details of the vessel, port and date of landing and the name of the vessel master or owner. This can be verified against the vessel list from the client group.</p>
<p>Does transshipment occur within the fishery?</p> <p>If Yes, please describe: If transshipment takes place at-sea, in port, or both; If the transshipment vessel may handle product from outside the UoC; How any risks are mitigated.</p>	<p>No transshipment occurs</p>
<p>Are there any other risks of mixing or substitution between certified and non-certified fish?</p> <p>If Yes, please describe how any risks are mitigated.</p>	<p>No - see above regarding bycatch stocks. Very limited. There are different processes in place between client and non-client vessels. Landing documentation requires catch locations to be recorded. Again, stock concentrated within UoC, no need to move fishing effort outside of the UoC.</p>

5.3 Eligibility to enter further chains of custody

Based on the current determination of this assessment CU UK confirm that sardines (*Sardina pichardus*) caught by CSMA member vessels (Table 7) in the Unit of Assessment defined in Table 2, will be eligible to enter certified chains of custody, and any subsequent seafood product is eligible to be sold as MSC certified and carry the MSC ecolabel subject to suitable chain of custody certification.

The intended change of ownership is when fish are landed at the processors, directly from the vessel the relevant landing ports listed below. Here they are sold and separate chain of custody certification is required from this point. There are no other parties or categories of parties, apart from the vessels that are eligible to use the fishery certificate.

MSC eligible sardines may be landed at the following ports: Newlyn and Mevagissey in Cornwall and Plymouth in Devon.

The CAB hereby inform the client that if they sell or label non-eligible (nonconforming) product as MSC certified, they must:

- a. Notify any affected customers and the CAB of the issue within 4 days of detection.
- b. Immediately cease to sell any non-conforming products in stock as MSC certified until their certified status has been verified by the CAB.
- c. Cooperate with the CAB to determine the cause of the issue and to implement any corrective actions required.

5.4 Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to enter further chains of custody

The fish stock is concentrated within the UoC and fishers do not fish outside of the UoC. The stock does extend beyond 7e and 7f but the UoC does not fish there. There is little to no chance of sardine outside of the UoC being landed as MSC certified and there is no IPI risk based on the present definition of the stock by ICES (ICES 2021a) and the location of the fleet effort within the boundaries of the UK 12 nm limit

6 Principles

6.1 Principle 1

6.1.1 Biology and ecology

6.1.1.1 Sardine in relation to Low trophic level and MSC requirements

Sardine is listed within Box SA1 FCR2.01 and therefore consideration is required in relation to whether Division 7 sardine is consistent with the MSC definition of key Low Trophic Level (LTL) stocks (SA2.2.9).

Criteria

- i. A large proportion of the trophic connections in the ecosystem involve this stock, leading to significant predator dependency.
- ii. A large volume of energy passing between lower and higher trophic levels passes through this stock;
- iii. There are few other species at this trophic level through which energy can be transmitted from lower to higher trophic levels, such that a high proportion of the total energy passing between lower and higher trophic levels passes through this stock (i.e., the ecosystem is 'wasp-waisted').

Response

Food web analysis and ECOSIM modelling show that this sardine stock is not responsible for large trophic connections in this ecoregion (Celtic Sea) (Hernvann et al. 2020; Lauria 2012). Rather the key trophic connections in the Celtic sea ecoregion as described by ICES (ICES 2020a) are spread between a suite of small pelagic species with the most numerous / abundant being mackerel, herring, horse mackerel, blue whiting, sprat, sardine and sandeel (Figure 54). For example herring and sardine occupy the same ecological niche but separate environmental niches best described by temperature gradients which vary within and between years (Hernvann et al. 2020). Modelling scenarios utilise blue whiting, mackerel, herring as the proxies for trophic connections through the ecosystem and sardine is grouped under a generalized 'small pelagic' category whereas the more abundant species (blue whiting, mackerel and herring) are individually defined (Lauria 2012). Due to the presence of numerous other species and their higher biomass, predatory demand cannot be exclusively confined to sardine. As such most of the energy transfer in this system does not pass through this stock and therefore does not meet the LTL criteria as outlined in the MSC guidance. The UoA is therefore assessed via PI1.1.1 not PI1.1.1a.

6.1.2 Total Allowable Catch (TAC) and Catch Data

There is no TAC for the stock but catch data for the UoA and the wider fishery are shown in Table 10.

Table 10. Catch Data. Sources: total catch = ICES (2021a), UoA Share = Logbook data. Note the CSMA fishing year crosses the calendar year and therefore the start year of the season is taken as the annual year to compare against ICES landings data

Total catch	Year	2019	Amount	7,936
UoA share of total catch	Year	2019	Amount	6,386

6.1.3 Catch and landings

Catches by all fleets are shown in Table 8, with the UoA catches from 2017 onwards shown in Table 11 below.

Table 11. UoA catches as percentage of total landings. Note the CSMA fishing year crosses the calendar year and therefore the start year of the season is taken as the annual year to compare against ICES landings data. Sources: ICES (2021a) and CSMA logbook records.

Year	CSMA (t)	Total landings (t)	CSMA %
2020/21	8,808	13,552	65.0
2019/20	6,386	7,936	80.5
2018/19	6,649	10,670	62.3
2017/18	6,675	12,662	52.7
Average	7,129	11,205	65.1

6.1.4 Survey data

The Pelagic ecosystem survey in the Western Channel and Celtic Sea (PELTIC) in a autumn acoustic survey, which provides two time-series of biomass index with different spatio-temporal coverage for the sardine stock (CEFAS 2019; CEFAS 2020b). The first index, “core area”, extends from 2013–2020 with a spatial coverage of English waters in 7e (excluding the Isles of Scilly) and the whole of 7f. From 2017, the survey was extended and thus the second index, “total area”, represents the whole of 7e and 7f (Figure 14).

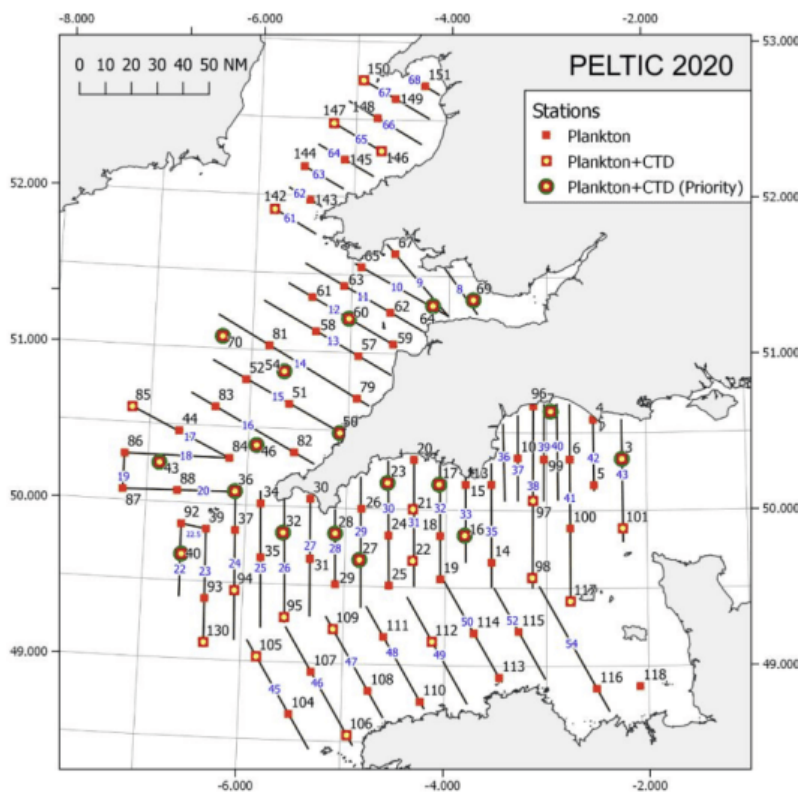


Figure 14. Peltic survey map 2020. Overview of the planned survey area, with the acoustic transect (black lines, numbers in blue), plankton stations (red squares) and hydrographic stations (yellow circles). Priority stations indicated in green. Source: CEFAS (2020b)

The PELTIC survey has been shown to capture the western and north-western boundary of the population consistently as evidenced by negligible sardine backscatter from the adjacent Celtic Sea Herring Acoustic Survey (CSHAS) survey (ICES 2021a). The absence of any (significant) sardine numbers in these waters confirms that the north-western limit of area 7 sardine is captured within the PELTIC survey coverage. The extension of the PELTIC survey in 2017 suggests a good coverage of the stock distribution, as well as an extensive coverage of the area where the majority of the fishery happens (ICES 2021a) (Figure 14; Figure 15).

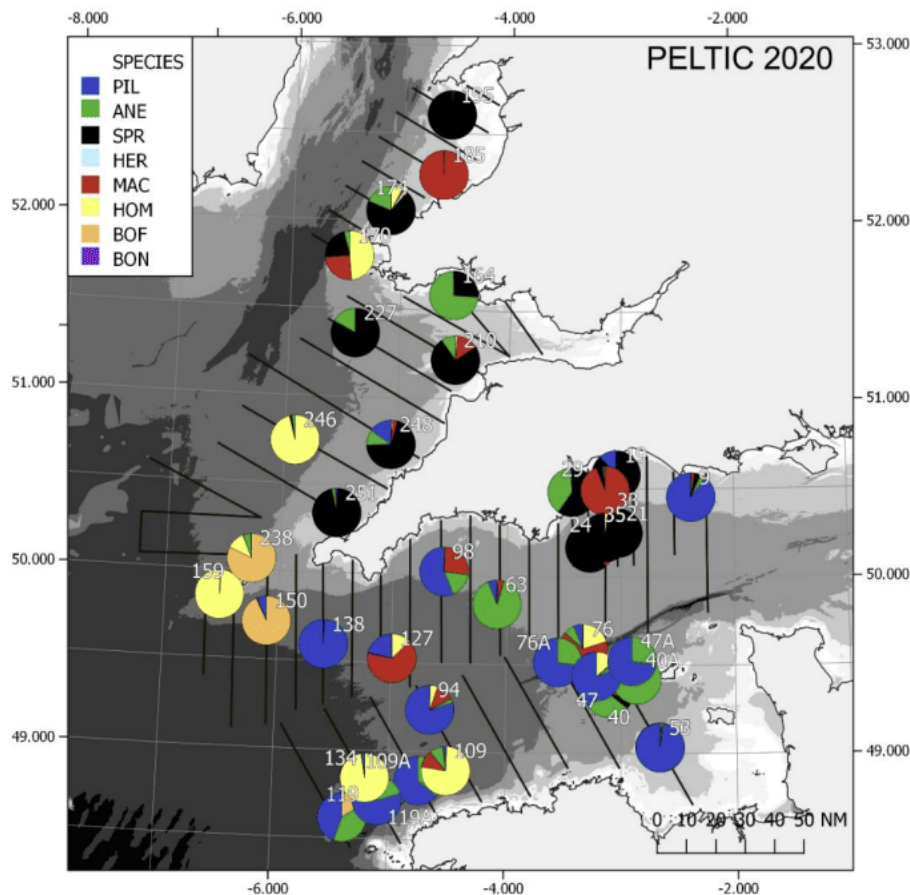


Figure 15. Overview map of the PELTIC20 survey area. Acoustic transects (black lines) and Trawl stations (pies) with relative catch composition by key species. Three letter codes: PIL=sardine, ANE=anchovy, SPR=sprat, HER=herring, MAC=mackerel, HOM= horse mackerel, BOF=Boarfish, BON=Atlantic bonito. Source: CEFAS (2020b).

In 2020, sardine was the most abundant small pelagic fish species in the PELTIC survey with a total biomass (for the total area), consistently surveyed since 2017 of 332,098 t (CV 0.21), slightly down from 2019 but the second highest in the time series (Figure 16) (CEFAS 2020b). Although widely distributed in the survey area, the core of the sardine distribution was located with the highest densities in southwest of the Cornish Peninsula (Figure 17). Sardine here comprised of fish from across the length spectrum, from 8-8.5 cm modal length up to fish larger than 23 cm. High numbers of sardine were also found in French waters (Figure 16) (CEFAS 2020b).

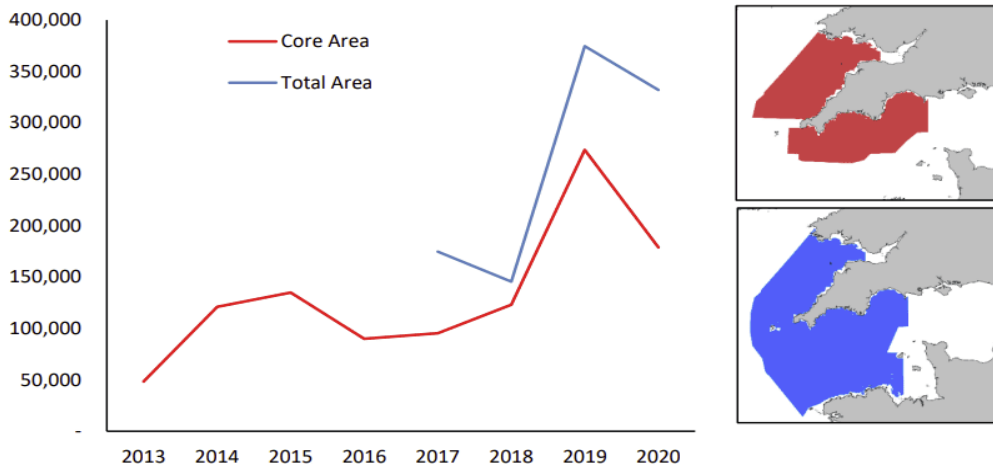


Figure 16. Sardine biomass (tonnes) trends (left) based on two available survey strata: the core area, consisting of the English waters of the western Channel and the Bristol Channel, surveyed consistently from 2013 (top right, red) and the total area, which also includes the Isles of Scilly and French waters of the western Channel, surveyed from 2017 (bottom right, blue). Source: CEFAS (2020b).

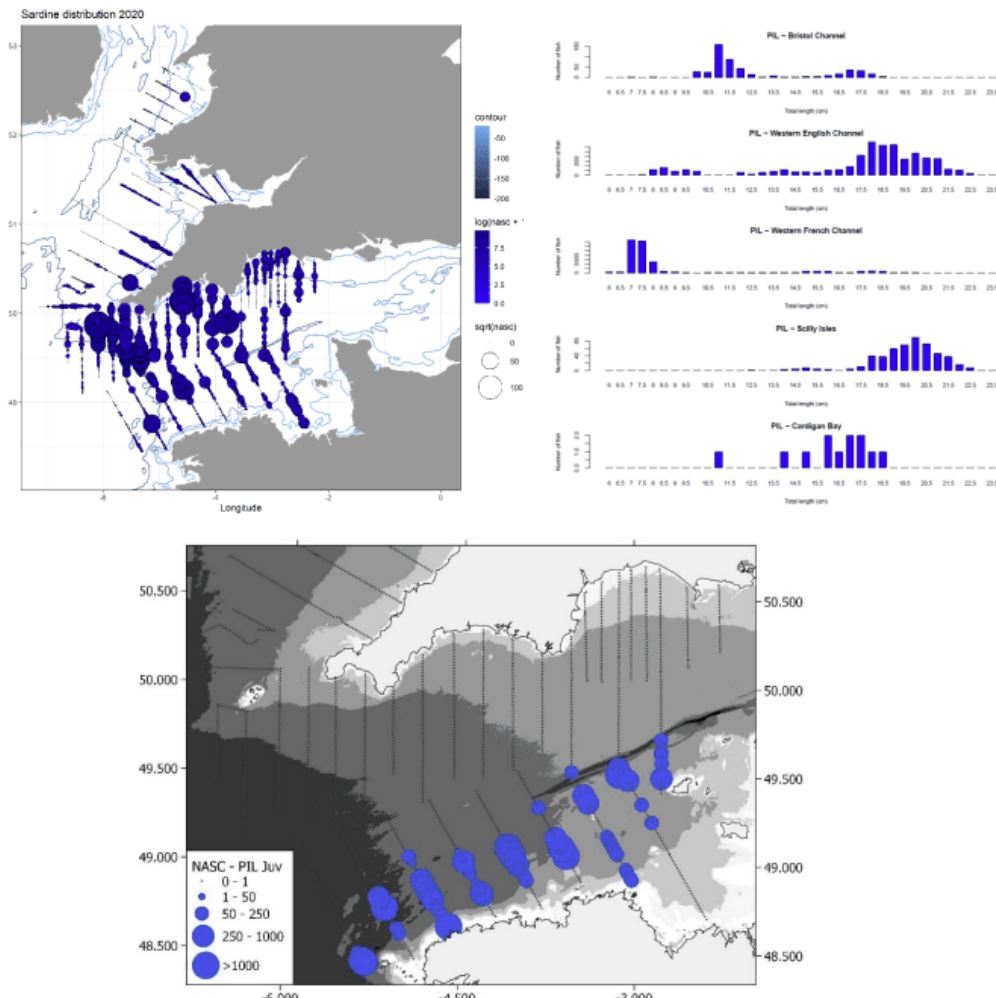


Figure 17. Relative acoustic density distribution of sardine (Nautical Area Backscattering Coefficient - NASC, top left), juvenile sardine in surface schools (bottom) and trawl-based length frequency histogram for sardine in the subareas of the PELTIC survey 2020 (top right). Source: CEFAS (2020b).

ICES reviewed the overall quality of the survey in 2021 and reported that the methodology and quality of data obtained from the PELTIC survey are ensured by the working Group on Acoustic and Egg Surveys for small pelagic fish in NE Atlantic (WGACEGG). That the extension of the PELTIC survey from 2017 provides good coverage of the stock distribution, and the area where the majority of the fishery happens (ICES 2021a). In addition, the short time-lag between the survey observations (October) and the assessment (November) further support the use of PELTIC biomass estimates as input data for stock assessment.

6.1.5 Stock Status and Assessment

The ICES Benchmark Workshop on West of Scotland Stocks (WKWEST) data compilation workshop, held from 14 to 18 September 2020, concluded that the landings and current availability of the biomass data provided by the PELTIC survey for sardine in Subarea 7 are appropriate to assess the stock and provide advice (ICES 2021a). Consequently, the availability of the biomass data to assess the stock implies an upgrade of stock category, being now classified as category 3. For stocks in categories 3 and 4 ICES currently uses MSY proxy reference points as part of a Precautionary Approach to provide advice on the status of the stock and exploitation. The F_{MSY} proxy corresponds to the exploitation rate that will provide maximum long-term yield (ICES 2018).

The WKWEST benchmark panel agreed that a surplus production model in continuous time (SPiCT) can be used to assess the status of the stock based on the relative biomass and fishing mortality to the reference points (B_{MSY} , F_{MSY}). The SPiCT model that produced the most plausible results was based on quarterly data on the sardine landings and the biomass estimated in the core area from 2013 to 2020, given the time-series of biomass in the total area was too short to produce meaningful results (Ouréns, Kooij, et al. 2021). The outputs show that the stock is in a good state, being the biomass above B_{MSY} and the fishing mortality below F_{MSY} (Figure 18). The sardine biomass in the core area shows an overall increase over time, with the lowest value of 48 kt in 2013 and the highest in 2019 of 274 kt (Figure 18). For the total area, biomass estimates ranged from 146 kt (2018) to 375 kt (2019). The biomass safeguard, estimated from the historical biomass index in the ‘total area’², was set at 92,858 t.

² The “Total Area” provides full coverage of the western Channel (7e, including the Isles of Scilly) and the eastern Celtic Sea (7f) but represents a shorter time-series (2017-2020) than the “Core Area”, consistently sampled over the whole time-series (2013–2020)

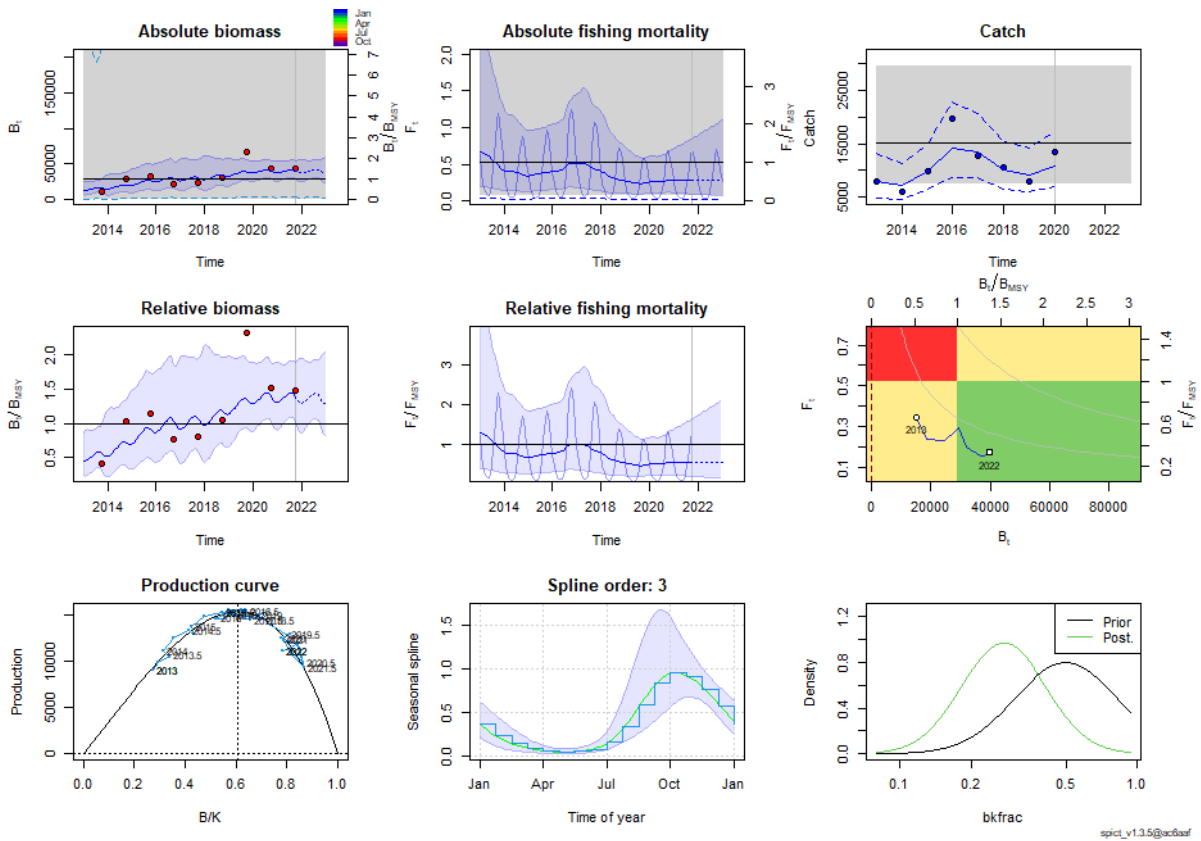


Figure 18. Main outputs of the model with the short time-series (2013–2020) and quarterly data. A prior was included to set the initial depletion of the stock at 50% of the carrying capacity. Legend: Estimates (fishing mortality, biomass, production, catch) are shown using blue lines. 95% CIs of absolute quantities are shown using dashed blue lines. 95% CIs of relative biomass and fishing mortality are shown using shaded blue regions. Estimates of reference points (B_{MSY} , F_{MSY} , MSY) are shown using black lines. 95% CIs of reference points are shown using grey shaded regions. The end of the data range is shown using a vertical grey line. Predictions beyond the data range are shown using dotted blue lines. Source: ICES (2021a).

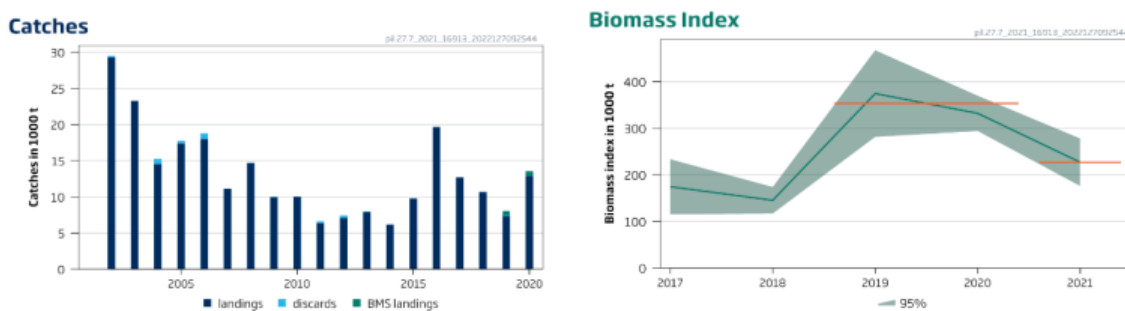


Figure 19. Sardine in Subarea 7. Catches disaggregated by category since 2002. The biomass was estimated from the total area of the acoustic survey PELTIC, and the shaded areas on the biomass plot represent 95% confidence intervals. The orange horizontal lines indicate the biomass index for 2021 and the average for 2019–2020. Source: ICES (2021d)

6.1.6 Stock management

6.1.6.1 ICES

Although the WKWEST benchmark panel agreed that a surplus production model in continuous time (SPiCT) can be used to assess the status of the stock, the benchmark concluded that it is not appropriate to provide advice given the high uncertainty associated to the absolute values of biomass,

fishing mortality and reference points. CEFAS therefore have proposed harvest control rules (HCR) based on ICES simulation modelling of small pelagic species and this rule, in which the advice is based on a comparison of the most recent index value with the 2 preceding values, combined with recent catch or landings data (ICES 2018). The 1 over 2 rule, in combination with an 80% symmetrical uncertainty cap and a biomass safeguard, is considered the most adequate method to assess this stock at the moment (ICES 2021a). This HCR, however, can result in reductions of catches due to the inability of the rule to take advice back to the previous level after hitting the lower cap. It has been noted that an 80% decrease in advice requires a 500% increase in the following advice to return to the previous level, taking a minimum of three years to achieve when an 80% uncertainty cap is applied (ICES, 2021b). The 1 over 2 rule with the 80% symmetrical cap and the biomass safeguard (I_{stat}) was applied to the sardine stock in Subarea 7 using the biomass trend index estimated from both the core area and the total area, using the smallest I_{stat} value of the time-series. The I_{stat} biomass safeguard represents a trigger biomass level below, which the advice would be corrected downwards. This harvest control rule (HCR) was applied with a retrospective character in order to analyse the trend of the advice if the HCR had been implemented when the data became available. The reference point should be revised in the next benchmark when the biomass time-series in the total area becomes longer (ICES 2021a).

The landings and biomass used to implement the rule for the first time will have a high impact on future advice. At the WKWEST workshop simulating a decrease in biomass for the next year, the advised catches in 2022 for sardine in Subarea 7 were found to range between 5,177 t and 19,732 t, depending on the approach used to implement the rule (ICES 2021a). Therefore, the 1 over 2 rule should be considered as a provisional HCR with the aim of achieving a better management approach within ten years (ICES 2021a). Using the F_{MSY} obtained from a surplus production model or a sustainable constant harvest rate determined by an MSE, are the preferable methods to provide advice for category 3 stocks of short-lived species (ICES 2021a). The application of a constant harvest rate for sardine has not been tested yet due to the absence of a stock-specific management strategy evaluation to identify a sustainable harvest rate (ICES 2021a).

In December 2021, the 1st ICES advice for the stock as a cat 3 stock, was released with the advice catch of 6,906 t using the HCR shown in Table 12. The biomass estimate derived from the total area of the PELTIC acoustic survey was used as the biomass index. The advice is based on the ratio between the last index value (index A) and the average of the two preceding values (index B), multiplied by the mean catches of the years 2019–2020. The index is estimated to have decreased by 36% and thus the uncertainty cap was not applied. The 1-over-2 rule with an uncertainty cap of 80% with a biomass safeguard is considered precautionary and as such a PA buffer was not considered. Discarding is considered negligible.

Table 12. Basis for catch advice for sardine in Subarea 7 in 2022. Source: (ICES 2021d)

Index A (2021)		227 117 tonnes
Index B (2019–2020)		353 358 tonnes
Index ratio (A/B)		0.64
Biomass safeguard (I_{stat})	Not applicable	
Uncertainty cap 80%	Not applied	
Mean catches (2019–2020)		10 745 tonnes
Discard rate		Negligible
Catch advice 2022 ***		6 906 tonnes
% advice change ^		Not applicable

* The figures in the table are rounded. Calculations were done with unrounded inputs, and computed values may not match exactly when calculated using the rounded figures in the table.

***[Mean catches (2019–2020)] x [Index ratio]

^ This is the first quantitative catch advice for this stock.

HCR simulations

The current ICES guidelines suggest that the average landings of the two most recent years should be used to implement the 1 over 2 rule for the first time to a stock of a short-lived species. However there is evidence that this guidance might not be appropriate for stocks which are only moderately exploited and that can support higher fishing pressures. For sardine in subarea 7 there is strong evidence of the stock being exploited below F_{MSY} in recent years and therefore higher fishing mortality might be applied without compromising the status of the stock. The reasons for this belief are the following: 1) outputs of the SPiCT model show that fishing mortality is below F_{MSY} and biomass is above B_{MSY} (ICES, 2021a); 2) the reported catches from opportunistic fleets (e.g. Dutch, German, and Danish pelagic trawlers) that target sardine sporadically but with a high intensity, were low in recent years; 3) the main contributor to the landings in recent years are the Cornish sardine fleet in the UK, who self-regulate the landings (usually at or below 10,000 t) based on several factors such as demand and previous catches; 4) the harvest rate in 2019 was 1.95 %, which is well below the harvest rate in previous years (around 7 % in 2017 and 2018) (Table 13). The WKDLSSLS3 (2021) working group explored different approaches to initiate the 1-over-2 rule (Table 13):

- 1) The general ICES guidelines of using the average landings of the last two years;
- 2) Average landings of the last 5 years;
- 3) Average landings of the full time-series (2002-2020);
- 4) Mean of the landings that would have been obtained in 2019 and 2020 if an average exploitation rate was applied;
- 5) Mean of the landings that would have been obtained in 2019 and 2020 if the ratio between the sum of the landings in the last four years and the sum of the biomass in the last 4 years was applied;
- 6) Mean of the landings that would have been obtained in 2019 and 2020 if the fishing mortality was equal to F_{MSY} . For the latter approach, the actual landings in 2019 and 2020 were divided by the relative fishing mortality for 2019 and 2020 derived from the SPiCT model.

The working group considered that the use of the average harvest rate (approach 4 in Table 13, Figure 20) could be a reasonable approach to minimise the impact of the recent low harvest rates on the advice. However, because this approach has not been tested in the Management Strategy Evaluation for all short lived species in early 2021, ICES applied the default guidance (1) to initiate the rule for this stock in 2022.

Table 13. Subarea 7 sardine harvest rate 2016-2020. Source ICES (2021f)

Year	Landings (t)	Biomass (t)	Harvest rate (%)
2016	19634		
2017	12662	174637	7.25
2018	10670	145514	7.33
2019	7317	374617	1.95
2020	10977*	332098	3.31*

Table 14. Sardine in Subarea 7. Catch advice in 2022 using different approaches to initiate the 1over-2 Rule.
Source ICES (2021f)

Approach	Technical basis	Catch advice 2022
1. ICES guidance	$\bar{C}_{2019-2020} \cdot IR_{2021}$	6906
2. Average catch 2016-2020	$\bar{C}_{2016-2020} \cdot IR_{2021}$	8297
3. Average catch 2002-2020	$\bar{C}_{2002-2020} \cdot IR_{2021}$	8456
4. Expected catch if average harvest rate was applied	$\sum_{2019}^{2020} (\overline{HR}_{2017-2020} \cdot B) / 2 \cdot IR_{2021}$	11807
5. Expected catch if the ratio \sum landings / \sum biomass was applied	$\sum_{2017}^{2020} C / \sum_{2017}^{2020} B \cdot IR_{2021}$	11807
6. Expected catch in 2019-2020 if $F=F_{MSY}$	$\sum_{2019}^{2020} (C / F_{MSY}) / 2 \cdot IR_{2021}$	13777

IR = index ratio; C = Catch; B = biomass; HR = harvest rate

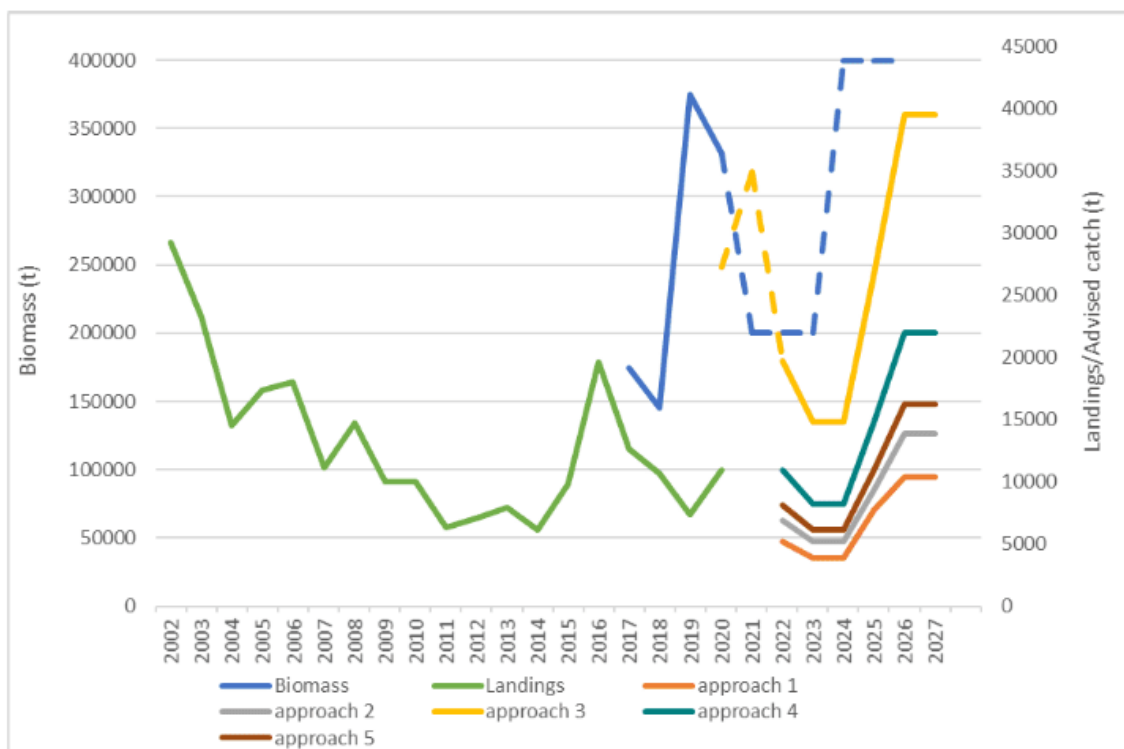


Figure 20. Sardine in Subarea 7. Catch advice in 2022 using different approaches to initiate the 1over-2 Rule.
Source ICES (2021f)

6.1.6.2 UK

The Trade and Cooperation Agreement (TCA) sets the framework for UK fisheries relations with the EU. Under the terms of the TCA tonnage limits, designed as a cap to prevent the displacement onto stocks that are economically-valuable but for which data is limited, will apply to catches of non-quota species like sardine. Given the delay in reaching an agreement for the 2021 fishing year, the Parties agreed not to apply tonnage limits, but will closely monitor and exchange landings data to support the

development of multi-year strategies for the conservation and management of non-quota stocks via the Specialised Committee on Fisheries (SCF) as a priority to ensure sustainable management of the stocks. The sardine stock in subarea 7 is a non-quota stock with annual catches driven by market needs and opportunistic fishing encounters. Reported catches by country are very variable over time and across ICES divisions, and up to 2021 it was not clear if this variability was caused by the opportunistic nature of some fleets or by misreporting. The WKWEST data compilation workshop concluded the high variability is primarily explained by shifts in fleets activity and species targeted over the years (ICES 2021a; Ouréns, Kooij, et al. 2021; Ouréns, Nash, et al. 2021). Sardine is the main target species for some of the fleets, whereas it is a bycatch species for others. The CSMA remain the only participants in the fishery which target the stock consistently on an annual basis and are responsible for the majority share of catches from the stock, up to 87% (2019).

6.1.6.3 CSMA harvest strategy and HCR

In the absence of a fishery wide harvest strategy and HCR tool for the stock CSMA have agreed an annual harvest limit for the fleet since 2018. The CSMA harvest strategy is enacted through their CSMA Code of Conduct (CoC) which all members sign annually. The CoC is based on the latest advice (CEFAS or ICES) and formalises the fishery's HCR tool within the context of the HS. All 15 members of the CSMA have met at least yearly (typically October and January) to examine overall fishery performance, get updates from CEFAS, and set vessel specific fishing quotas. The specific harvest rules included a cap on vessel licenses (15), vessel size limit (15 m) and headline length (450 m). The mesh size used by the fishery is on average 20 mm with some operators operating slightly larger meshes. The legal requirement is 16 mm (HM 2019b). In addition there is a minimum size limit (Minimum Conservation Reference Size) of 11 cm in UK waters applied through a [statutory instrument in the UK](#).

For the 2019-2020 season a Harvest Control vote by the CSMA was undertaken in July 2019 as part of the Annual General Meeting (AGM). This resulted in an agreed (9 in favour, 1 against, 1 no response) adoption of catch limits and pool system for the period 1st July 2019 to 31st December 2019. ICES advice recommend a total catch not exceeding 34,364 t across all fisheries. The CSMA adopted the following approach to set a catch limit for the UoA. The CSMA used the 20% Harvest Rates (HR) control rule proposed by CEFAS. The CSMA applied the following methodology to set a total CSMA catch limit:

- 20% harvest rate of the estimated biomass (145,514 t) for the PELTIC 2018 survey year = 29,103 t.
- Calculate UK average catch percentage from 2010-2018 ICES data = 55.3%
- 55% of 29,103 t gives a value of 16,007 t
- CSMA take 95% UK catch so the CSMA used 95% of 16,007 t = 15,206 t as the maximal catch for the fleet for the year. This is the start value from which the harvest control discussion at CSMA was derived.
- For 2019 the CSMA then agreed a catch limit of 10,048 t for the season which is 5,158 t lower than the maximal catch. This value was based on the basic agreement of a minimum of 400 t per vessel. With an uplift of 20% for those vessels actively catching near their 2018 allocation.
- The agreed total catch was to be reviewed in November 2019 to allow reallocation of unused catch back into the pool for all vessels who had not reached 75% of their allocation.

In 2020, on review of the PELTIC survey data for 2019 the total biomass estimate from the survey increased to 375 kt (the highest on record) (CEFAS 2019) and in the absence of new ICES advice (as a category 5 stock at the time the advice was biannual) CSMA voted to maintain the catch limit of 2019 at 10,048 t. Similarly in 2021, with a biomass estimate at 332,098 t (CEFAS 2020b) the annual general meeting (AGM) voted and implemented a pooled catch limit at 10,483 t for 2021, with a review catch limit in November when the new ICES advice (based on the WKWEST outputs (ICES 2021a)) was to be issued. The CSMA also agreed to maintain a monthly review of catches internally to monitor against the limit.

For 2022 and following the publication of the ICES advice of 2021 (ICES 2021d), CSMA raised its concern with CEFAS in relation to the 6,906 t ICES advice, which as described in section 6.1.6.1 – HCR simulations was based on the default guidance of using the average landings of the two most recent years implementing the 1 over 2 rule for the first time to the stock. Given the fishing pattern of the Cornish sardine fleet and recently low reported catches from opportunistic fleets, this default guidance uses information from two years when the harvest rates and landings were very low, which leads to an unnecessary low catch advice as shown in section 6.1.6.1 and the harvest rate in Table 13. The ICES advice for data limited stocks (ICES 2020c; ICES 2012) is implicitly designed to be applied to fisheries where previously there has been no ‘catch limit’ and stocks that are being fished at or above F_{MSY} . ICES (2021d) acknowledges that such guidance might not be appropriate for stocks moderately exploited that can support higher fishing pressures.

As detailed in section 6.1.6.1, the sardine stock in Subarea 7 has not been fished at or above F_{MSY} since 2013 (Figure 18). In that time F has been around 50 % of F_{MSY} and in effect, if the CSMA had not applied their catch limit and fished the stock at F_{MSY} , the ICES advice for 2022 based on the HCR rule shown in Table 12 would have been significantly higher. Indeed the benchmark of the stock identified that the 1 over 2 HCR could result in advised catches between 5,177 t and 19,732 t in 2022, depending on the approach used to implement the rule and the rule should be considered as a provisional HCR with the aim of achieving a better management approach within ten years (ICES 2021a). ICES (ICES 2021g) concludes that expert groups should use their knowledge of the stock and the fishery to determine a suitable starting catch or harvest rate, representative of the average performance of the fleet, to trigger the implementation of the rule.

The CSMA and CEFAS notified the assessment team, at the site visit (see Appendix 8) of the lack of appropriateness in the ICES advice (ICES 2021d) with reference to the WKWEST information (ICES 2021a) and subsequent HCR simulations (ICES 2021g). As a result the CSMA in consultation with CEFAS redrafted their HCR for 2022.

The new HCR is directed by three key objectives which are agreed by all members (see agreement in Appendix 11 - CSMA agreed HCR and fishery specific objectives).

1. Fishery specific objective: Maintain good and adaptive management procedures that utilise a precautionary approach towards the long-term sustainability of the fishery, based on the biological and population characteristics of the species.
2. Environmental objective: To minimise the impact of fishing activity on the marine environment. Maintain an effective code of conduct for all CSMA members.
3. Economic objective: Maintain stability of the resource in such a way as to ensure its economic sustainability and ongoing benefit to the Cornish, Plymouth community and CSMA members.

This HCR will be used for the period 2022-2024 or until a new ICES process of formulating the advice is agreed (whichever is soonest). The HCR will be re-evaluated by CSMA and Cefas after that period.

Each calendar year:

1. The CSMA will set an annual catch limit for the CSMA fleet based on catch history of the CSMA as a proportion of the overall catch of the stock over the preceding 3 years.
2. The CSMA will consult with Cefas if the proposed CSMA catch limit is sustainable and point 3 will be followed:
3. Cefas will evaluate if the proposed catch limit meets the following points:
 - i. The catch limit likely maintains the overall exploitation rate below F_{MSY} ; and
 - ii. not likely leads to an overall exploitation rate that would reduce biomass to approach the point of recruitment impairment.
 - a. If Cefas agree that the CSMA proposed catch limit as laid out under Point 3. i-ii are met, then then the proposed harvest rate will be offered to members for acceptance as the CMSA catch limit for the forthcoming calendar year.
 - b. If Cefas consider that the CSMA proposed catch limit as laid out under Point 3. i-ii are not met, then CSMA will adopt a catch level advised by Cefas which ensures that Point 3 i-ii is met or will follow the ICES HCR, whichever is higher.
4. Where a reduction in catch limits is required by the CSMA under 3.b., the CSMA may choose to limit catch reductions by a maximum of 10% of the previous year's catch limit. This is to avoid large reductions in catch which may have severe socioeconomic impacts in the fishery and could lead to the fishery failing to meet the fishery objective for economic sustainability. Under this scenario the CSMA will request that Cefas evaluate any proposed decrease with respect to whether the reduction can be expected to reduce F below F_{MSY} within a reasonable time frame relevant to the stock. Once a catch limit is agreed between Cefas and CSMA, the proposed harvest rate will be offered to members for acceptance as the CMSA catch limit for the forthcoming calendar year.

At interview (see Appendix 8) CEFAS confirmed that the CSMA HCR allows for catch limits above the ICES advice (because of the issues in the ICES HCR) but importantly requires annual 'approval' confirmation with CEFAS that the advice is appropriate and does not risk F being too high [$F > F_{MSY}$]. It also contains clauses where if CEFAS do not agree to the CSMA catch proposal for CEFAS to recommend a level. This should ensure that that the catch advice is reduced if RPs are approached. The CSMA HCR has a proposed time limit to 2024 whilst the information that underpins the stock assessment and the HCR is further developed. Therefore the CSMA HCR should be considered a key HCR tool in the short term with an aim to have an improved ICES HCR by the time of the next interbenchmark.

6.1.7 Principle 1 Performance Indicator scores and rationales

Scoring table 1. PI 1.1.1 – Stock status

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guide post	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
	Met?	Yes	Yes	No

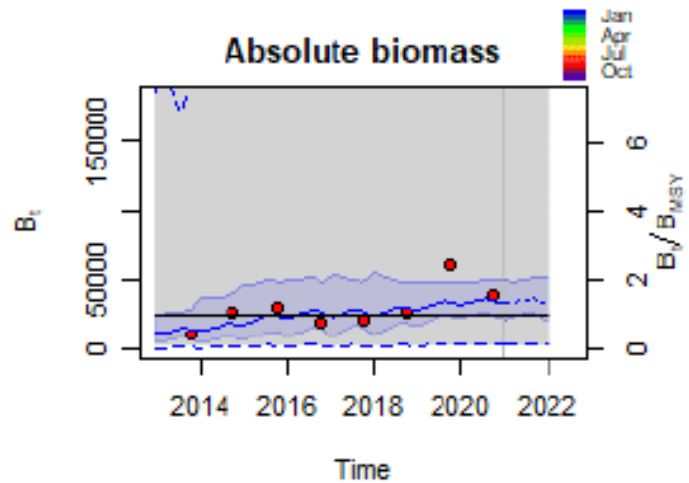
Rationale

The latest stock assessment was completed as part of the WKWEST benchmark in 2021 (ICES 2021a). The outputs of the accepted SPiCT model for the subarea 7 stock show that, based on quarterly data on the sardine landings and the biomass estimated in the core area from 2013 to 2020, the stock is in a good state, with the biomass above B_{MSY} and the fishing mortality below F_{MSY} (Figure 18). A biomass safeguard (I_{stat}) was also estimated from the historical biomass index in the ‘total area’ and it was set at 92,858 t. That value has been revised. The I_{stat} value estimated using the biomass index in the total area from 2017 to 2020, data available at the moment of the benchmark, should be 109 965 tonnes (ICES, 2021a). I_{stat} is calculated from the following equation:

$$I_{stat} = geometric(I_{hist}) \cdot \exp(-1.645 \cdot sd(\log(I_{hist})))$$

Where I_{hist} is the available historical series of the biomass index. The assessment team consider I_{stat} as suitable proxy for PRI.

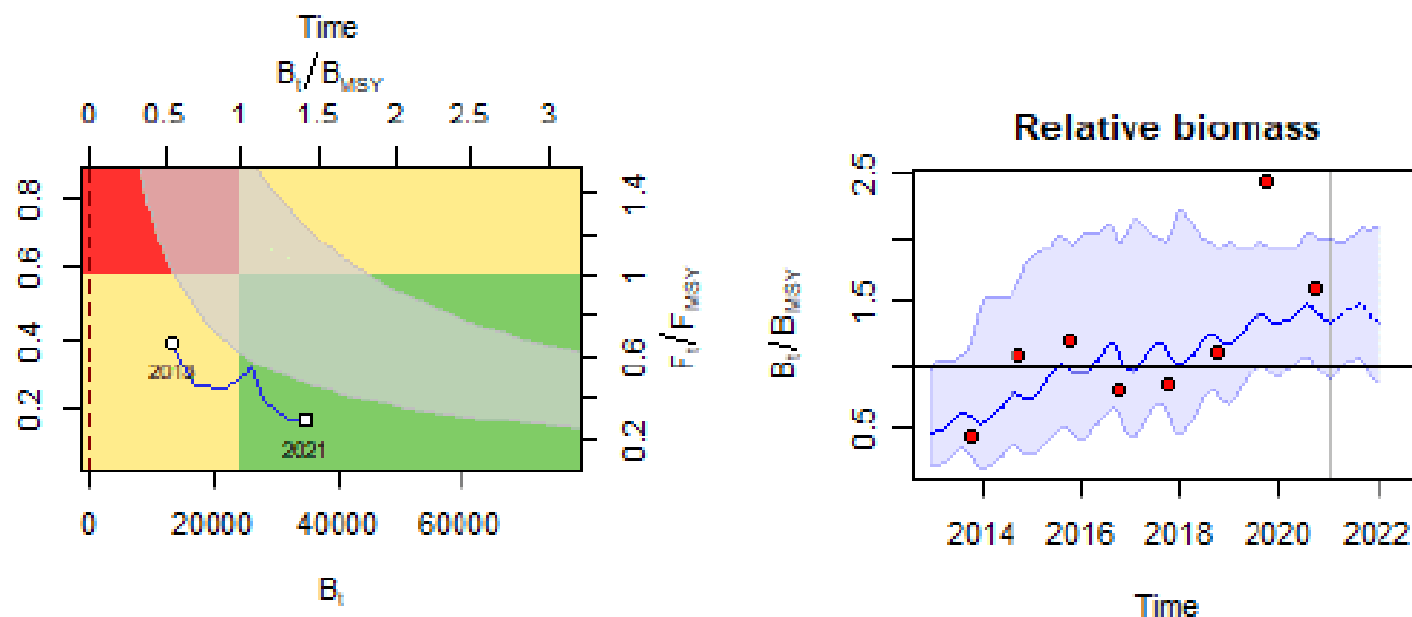
In 2020 the biomass of sardine in the Total Area was estimated at 332 kt (CV 0.21), slightly down from 2019 (375 kt) but the second highest in the time series (Figure 16). According to the most recent estimate, the biomass of sardine in the Total Area was 227 kt in 2021 (CEFAS 2020b). The sardine biomass in the Core Area shows an overall increase over time, with lowest value of 48 kt in 2013 and the highest in 2019 of 274 kt. It is therefore highly likely that the stock is above the point where recruitment would be impaired. **SG60 and SG80 are met.** However, although biomass estimates for the total area are well above I_{stat} , there cannot be a high degree of certainty that the stock is above the PRI given the high uncertainty associated with absolute values of biomass, which were shown in the benchmark. The absolute biomass figure (below) shows 95% CIs of absolute quantities using dashed blue lines and the lower value is below I_{stat} . **SG100 is not met.**



b	Stock status in relation to achievement of Maximum Sustainable Yield (MSY)		
	Guide post	The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?	Yes	No

Rationale

The outputs of the SPiCT model show that the stock is in a good state, being the biomass above B_{MSY} and the fishing mortality below F_{MSY} since 2013 (figure below and Figure 18) (ICES 2021a; Ouréns, Kooij, et al. 2021; Ouréns, Nash, et al. 2021). **SG80 is therefore met.** There is however no high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years, with total biomass estimated to be below B_{MSY} in 2013. Data available to assess the stock in Subarea 7 have been limited to a few years only. Following ICES advice (ICES 2017a), new data have been collected to assess this stock only since 2017. **SG100 is not met.**



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Ouréns, R., Nash, R. & Van Der Kooij, J., 2021. Evaluation of the independent and dependent fisheries data available to assess the sardine (*Sardina pilchardus*) stock in subarea 7 (Southern Celtic Seas and the English Channel). Working document to WKWEST data compilation workshop., Cefas.

Stock status relative to reference points

	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	$I_{stat.}$	109,965 t total stock biomass.	Total biomass = 332,098 t (CV 0.21) TB/ $I_{stat.}$ = 3.0
Reference point used in scoring stock relative to MSY (SIb)	$B_{MSY.}$	~250,000 t (based on Figure 18)	Total biomass = 332,098 t (CV 0.21) TB/ MSY = ~1.4 (based on Figure 18)
Overall Performance Indicator score	80		
Condition number (if relevant)	N/A		

Scoring table 2. PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guide post	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	Yes	Yes	No

Rationale

The MSC definition of a Harvest Strategy is the combination of monitoring, stock assessment, harvest control rules and management actions, which may include a management plan.

All vessels procuring the stock are subject to technical measures for vessel power/ gear types / mesh sizes in the EU (EU 2019b) and UK (HM 2019), however the sardine stock in subarea 7 is a non-quota stock with annual catches driven by market needs, opportunistic fishing encounters and in the case of sardine fishery in Seine Bay (7d) it has been closed for human consumption since 2010 due to PCB contamination. As such, the CSMA remain the only participants in the fishery, which target the stock annually and are responsible for the majority share of catches from the stock (Table 11) up to 87% (2019) averaging 65%.

GSA2.4 of the FCR2.01 outlines four key elements to informal approaches to scoring this PI - Harvest Strategies relevant to this fishery. These are:

- *The assessment should factor in the likelihood of changes within the fishery that could potentially lead to an increase in the risk of impact from fishing activity over time.*
- *Teams should further consider how elements of the strategy are combining to ensure that the fishery is moving in the desired direction or operating at a low risk level and that qualitative or semi-quantitative objectives are being achieved.*
- *There should be evidence that the expected objectives are being achieved. Evidence may be demonstrated through local knowledge or research.*

- *CABs should determine the extent to which there is feedback and learning mechanism to inform the harvest strategy on an ongoing basis. Depending on the scale of the fishery this could be through informal stakeholder processes that are based on local knowledge of the fishery or any other less subjective review process.*

Monitoring of the stock status is considered adequate for management needs as evaluated by ICES in the 2021 benchmark (ICES 2021a). There is fishery-independent survey data, which monitors the total biomass of the stock annually and through the UoA, there is a self-sampling program that provides fishery dependent length-frequency data and discard into the assessment process, although the time-series of this is weak at present and prevents its use in the current assessment (CEFAS 2020a). Catch data is reported by all EU member states under the requirements of the Common Fishery Policy (CFP) and by the UK as part of its UK MoU with ICES (UK 2021a). Catch information is variable over time by member states and it is not clear if this variability was caused by the opportunistic nature of some fleets or by misreporting (ICES 2021a), however the information has been viewed as adequate for stock assessment purposes.

The stock as of 2021 is considered a Category 3 stock by ICES and stock assessment advice will now be given on an annual basis. The first of this Category 3 advice was published in December 2021 (ICES 2021d) and was reviewed in section 6.1.5 and PI 1.1.1. The stock is in a good state, with the biomass above B_{MSY} and the fishing mortality below F_{MSY} (Figure 18), the assessment has biomass safeguards and allows for annual advice to be given.

HCR. As part of a Precautionary Approach to provide advice on the status of the stock and exploitation, the 1 over 2 rule is considered the most adequate method to assess this stock at the moment (ICES 2021a) and the 2021 advice is based on this method (Figure 21). This rule is defined as advice on fishing opportunities for the coming year(s), is based on the recent advised catch (or landings) adjusted to the change in the stock size index for the single most recent value relative to the two preceding values (ICES 2018). Using the 1 over 2 rule as an HCR, and retrospective analysis, the advised catches in the total area for 2020 based on this proposed HCR would have been 27,000 t, whilst landings were ~ 11,000 t (Figure 21). The 2021 advised catch based on the proposed HCR was ~27,000 t for the total area. It should be noted that using the 1 over 2 rule as a HCR has been in combination with the 80% symmetrical uncertainty cap and biomass safeguard, however, can result in reductions of catches and ICES consider in the long term that using the F_{MSY} obtained from a surplus production model or a sustainable constant harvest rate determined by an MSE, are the preferable methods to provide advice in the long term (ICES 2021a). The HCR proposed by ICES has been formally presented for the stock in the December 2021 advice (ICES 2021d) and advised catches are 6906 t although there is no catch limit control on the stock at the EU or UK national level. See PI 1.2.2 for discussion on the adopted ICES HCR for 2022 and its appropriateness.

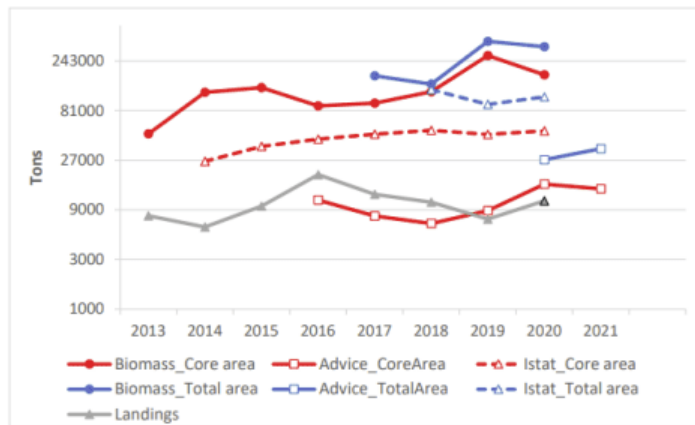


Figure 21. Simulation of advice resulting from applying the 1 over 2 rule with a 80% uncertainty cap with a retrospective character. The rule has been applied using both the biomass trend derived from the total area and the core area. The biomass and I_{stat} values from total area and core area are also represented. Note the y-axis is in a logarithmic scale. Source: ICES (2021a).

The CSMA is the only fleet targeting the stock on an annual basis and in the absence of a fishery wide harvest strategy which includes an HCR tool for the stock they have developed their own including an agreed annual harvest limit for the fleet since 2018. The CSMA harvest strategy is enacted through their CSMA Code of Conduct (CoC) which all members sign annually. The specific harvest rules included a cap on vessel licenses (15), vessel size limit (15 m) and headline length (450 m). All 15 members of the CSMA have met at least yearly (typically October and January) to examine overall fishery performance, get updates from CEFAS, and set vessel specific fishing quotas. The mesh size used by the fishery is on average 20 mm with some operators operating slightly larger meshes. The legal requirement is 16 mm (HM 2019b). In addition there is a minimum size limit (Minimum Conservation Reference Size) of 11 cm in UK waters applied through a [statutory instrument in the UK](#).

For the 2019-2020 season a Harvest Control vote by the CSMA was undertaken in July 2019 as part of the Annual General Meeting (AGM). This resulted in an agreed (9 in favour, 1 against, 1 no response) adoption of catch limits and pool system for the period 1st July 2019 to 31st December 2019. ICES advice recommend a total catch not exceeding 34,364 t across all fisheries. The CSMA adopted the following approach to set a catch limit for the UoA. The CSMA used the 20% Harvest Rates (HR) control rule proposed by CEFAS. The CSMA applied the following methodology to set a total CSMA catch limit:

- 20% harvest rate of the estimated biomass (145,514 t) for the PELTIC 2018 survey year = 29,103 t.
- Calculate UK average catch percentage from 2010-2018 ICES data = 55.3%
- 55% of 29,103 t gives a value of 16,007 t

- CSMA take 95% UK catch so the CSMA used 95% of 16,007 t = 15,206 t as the maximal catch for the fleet for the year. This is the start value from which the harvest control discussion at CSMA was derived.
- For 2019 the CSMA then agreed a catch limit of 10,048 t for the season which is 5,158 t lower than the maximal catch. This value was based on the basic agreement of a minimum of 400 t per vessel. With an uplift of 20% for those vessels actively catching near their 2018 allocation.
- The agreed total catch was to be reviewed in November 2019 to allow reallocation of unused catch back into the pool for all vessels who had not reached 75% of their allocation.

In 2020, on review of the PELTIC survey data for 2019 the total biomass estimate from the survey increased to 375 kt the highest on record (CEFAS 2019) and in the absence of new ICES advice (as a category 5 stock at the time the advice was biannual) CSMA voted to maintain the catch limit of 2019 at 10,048 t. Similarly in 2021, with a biomass estimate at 332,098 t (CEFAS 2020b) the annual general meeting (AGM) voted and implemented a pooled catch limit at 10,483 t for 2021, with a review catch limit in November when the new ICES advice (based on the WKWEST outputs (ICES 2021a)) will be issued. The CSMA also agreed to maintain a monthly review of catches internally to monitor against the limit.

The CSMA in consultation with CEFAS developed a new Harvest Control Rule (HCR) for the Sardine stock in Subarea 7 in 2022 and these are designed to meet with the fishery specific objectives (ICES 2021d):

1. Fishery specific objective: Maintain good and adaptive management procedures that utilise a precautionary approach towards the long-term sustainability of the fishery, based on the biological and population characteristics of the species.
2. Economic objective: Maintain stability to the resource in such a way as to ensure its economic sustainability and ongoing benefit to the Cornish, Plymouth community and CSMA members.

The 2022 HCR will be used for the period 2022-2024 or until a new ICES process of formulating the advice is agreed (whichever is soonest). The HCR will be re-evaluated by CSMA and Cefas after that period.

Each calendar year:

1. *The CSMA will set an annual catch limit for the CSMA fleet based on catch history of the CSMA as a proportion of the overall catch of the stock over the preceding 3 years.*
2. *The CSMA will consult with Cefas if the proposed CSMA catch limit is sustainable and point 3 will be followed.*
3. *Cefas will evaluate if the proposed catch limit meets the following points:*
 - i. *likely maintain the overall exploitation rate below F_{MSY} ; and ii) not likely lead to an overall exploitation rate which would reduce biomass to approach the point of recruitment impairment.*

- a. *If Cefas agree that the CSMA proposed catch limit as laid out under Point 3.i-ii are met, then then the proposed harvest rate will be offered to members for acceptance as the CMSA catch limit for the forthcoming calendar year.*
- b. *If Cefas consider that the CSMA proposed catch limit as laid out under Point 3.i-ii are not met, then CSMA will adopt a catch level advised by Cefas which ensures that Point 3.i-ii is met or will follow the ICES HCR, whichever is higher.*

4. *Where a reduction in catch limits is required by the CSMA under 3.b., the CSMA may choose to limit catch reductions by a maximum of 10% of the previous year's catch limit. This is to avoid large reductions in catch which may have severe socioeconomic impacts in the fishery and could lead to the fishery failing to meet the fishery objective for economic sustainability. Under this scenario the CSMA will request that Cefas evaluate any proposed decrease with respect to whether the reduction can be expected to reduce F below F_{MSY} within a reasonable time frame relevant to the stock. Once a catch limit is agreed between Cefas and CSMA, the proposed harvest rate will be offered to members for acceptance as the CMSA catch limit for the forthcoming calendar year.*

CSMA members continue to closely analyse ICES annual assessments in relation to stock status together with CEFAS scientist reports and CEFAS have informed CSMA on developing their catch limit. In the event the ICES recommendations require modifications on the exploitation of the resource, there is evidence that CSMA members agree to adapt their management framework, respecting the scientific advice to maintain sustainable catch limits. Additionally, the CSMA participate actively with scientific works to promote understanding of the sardine stock. The continued commitment of CEFAS scientists to work with CSMA provide the fishery with the capacity to implement these measures and assess the response of these actions in the fishery.

With respect to the four key points identified in GSA2.4 it can be said that:

- The new stock assessment (WKWEST) and annual monitoring, both fishery independent and dependent, account for of changes within the fishery over time. The major risk here would be regular targeting by non-UoA fleets on the stock. This is accounted for by the annual reporting by Member States, the new annual stock assessment process and in terms of the UoA would be reviewed as part of their annual AGM, HCR rule and the UoA catch share.
- The fishery can be considered to be moving in the desired direction through the UoA led self-sampling program, the progression to ICES category 3 stock status and that the objective of maintaining the stock above MSY is being achieved (see PI1.1.1). ICES also indicate that there is plan for development of the HCR in the long-term through using the F_{MSY} obtained from a surplus production model or a sustainable constant harvest rate determined by an MSE, which are the preferable methods to provide advice in the long term (ICES 2021a)
- The evidence that the expected objectives are being achieved is evident in the WKWEST benchmark and shown in Figure 21.
- There is a feedback and learning mechanism shown in the fishery which is informing the harvest strategy on an ongoing basis. The UoA are in regular contact with the fishery scientists, participate in the fishery dependent research. The CSMA have a monthly and within season (November) meetings planned to review catches and have been shown to annually review their catch limit with reference to the latest advice whilst agreeing actions with the relevant authorities.

On the basis of the above the assessment team view that **SG60 and SG80 are met**, but the lack of an overall 'design' to the harvest strategy and the lack of an HCR for all vessels **SG100 is not met**.

b	Harvest strategy evaluation			
	Guide post	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Yes	Yes	No

Rationale

Indications from both the PELTIC survey (CEFAS 2020b) and the outputs of the SPiCT model (ICES 2021a) show that, based on quarterly data on the sardine landings and the biomass estimated in the core area from 2013 to 2020, the stock is in a good state. Moreover, the sardine biomass in the core area shows an overall increase over time. The time-series of biomass estimated from the PELTIC in the core area surveyed since 2013 has significantly increased in the last three years, reaching the highest biomass in 2019 with 273,708 t of sardine. In addition, F is below F_{MSY} which is the objective in the Common Fisheries Policy, UK Fisheries Act and the CSMA and both the CSMA HCR and ICES HCR (1 over 2 rule) are designed to maintain this. As such the **SG60 and SG80 levels are met**. The performance of the harvest strategy has not been fully evaluated at the stock level. **SG100 is not met**.

c	Harvest strategy monitoring	
	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.
	Met?	Yes

Rationale

Sardine in the Celtic Sea is dependent on the abundance of the incoming year class which is highly variable and largely dependent on environmental factors. Therefore, the population needs to be closely monitored by fishery-independent research surveys. Both the self-sampling data (CEFAS 2020a) and the PELTIC survey (CEFAS 2020b) are used to monitor the stock and inform the new annual stock assessment process to determine if the harvest strategy is effective. The expansion of the PELTIC survey in 2017 and the definition of stock boundaries in Subarea 7 provides increased confidence that the entire stock area is surveyed. Finally, data reporting from the fisheries procuring the stock is available on an annual basis also, via member states of the EU requirements and the UK MoU with ICES (UK 2021a). **As such this guidepost is met**.

d	Harvest strategy review
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Guide post
Met?

The harvest strategy is periodically reviewed and improved as necessary.
Yes

Rationale

F below F_{MSY} is the objective in the Common Fisheries Policy which was reviewed and incorporated into the 2020 UK Fisheries Act and the CSMA objective number 1. At the CSMA level the Harvest strategy has been reviewed every year since 2017 and the stock was separated from the Subarea 8 sardine stock. The CSMA have made improvements to the effectiveness of their operation which include the establishment of fishery objectives, self-sampling for length frequency (monitoring), and HCR adjustments which would be suitable to meet this guidepost. At the overall stock level there has been reviews of the surveys, leading to improved coverage of the stock from 2017, in 2021 there has been a comprehensive review of the stock assessment (WKWEST) and upgrades in advice being applied and planned for the future. The HCR 1 over 2 rule with the 80% symmetrical cap and the biomass safeguard (I_{stat}) was applied to the sardine stock in Subarea 7 with a retrospective character in order to analyse the trend of the advice if the HCR had been implemented when the data became available, and this was pre-tested in an MSE to ensure it was precautionary. Although the rule is considered the most adequate method to assess this stock at the moment, the starting reference point should be revised in the next benchmark when the biomass time-series in the total area becomes longer. As such the rule should be considered as a provisional HCR with the aim of achieving a better management approach within ten years. There is therefore evidence of review and understanding of the limitations of the current harvest strategy and also evidence that improvements are needed and planned for **SG100 is met**.

e	Shark finning			
	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	N/A	N/A	N/A

Rationale

Sardine is not a shark.

f	Review of alternative measures
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	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	Yes	Yes	Yes

Rationale

Unwanted catches from the UoA relate to slippage events. The knowledge base of survival from slippage for sardines remains the work of Catchpole et al. (2015) and the CSMA adopted the high survivability protocol described in this paper through the CSMA slippage policy (CSMA 2017b). The policy follows the high survivability exemptions in place for herring and mackerel targeted fisheries within the EU which requires that herring should be released at the latest when 80% of the net is aboard and mackerel at or before 90%. The CSMA therefore suggested that all vessels attach visible markers to nets at 80% and 90% allowing easy identification of these points during hauling (CSMA 2017b). Shared catches, where one vessel calls in a second ring-netting vessel to pump from their net when they have too many sardines, is permitted in this fishery and is encouraged in the Code of Conduct. *‘Members shall endeavour to ensure their fishing activities prevent overfishing and excess fishing capacity and not lead to more fish being caught than can be safely carried by the available vessels. Skippers shall communicate with nearby vessels at every opportunity to manage larger catches. In the event of an excessive catch which cannot be shared with another vessel, fish in the net should be released alive at the earliest possible point in the fishing operation.’* (CSMA 2017a).

There have been no reports of mass stranding of slipped fish for the season 2019 (MMO, Daisy May pers. comm. reported in Jones et al. (2020)) which offers qualitative evidence that the measures implemented are being effective. The slippage policy was reviewed and updated in 2020 (CSMA 2020b). In addition a meeting held by the CSMA in February 2020 (CSMA 2020d)(CSMA 2020b) there is evidence of discussion of alternative measures to help with reducing slippage these are:

- Best to release fish before brailing of pumping begins.
- Trying to release fish early in process
- Setting up a committee to review incidents
- Possible sanctions for vessels not abiding by CoC
- Gear modifications were also discussed
- Reduce net floatation
- V-cut bunt end making easier to spill fish
- Reducing net length
- Multicoloured bunts to mark fish volumes
- Possible use of cameras onboard for monitoring

At the site visit it was identified that implementation of the CCTV on all vessels (section 6.2.2.5) and the review committee had been completed by the fleet. In addition some vessels adding V-cut bunt end making easier to spill fish and other vessels adding a slip ring system at the end of the net to allow slipping from the end of the net rather than over the headline (Figure 22) as examples of implementation of reducing unwanted catch mortality.

On the basis of the above SG60, SG80 and SG100 are met.

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Overall Performance Indicator score	90
Condition number (if relevant)	N/A

Scoring table 3. PI 1.2.2 – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guide post	Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.
	Met?	Yes	Yes	No

Rationale

The sardine stock in subarea 7 is a non-quota stock and whilst there are technical measures for vessel power/ gear types / mesh sizes associated with vessels which target this stock in the EU (EU 2019b) and UK (HM 2019) up until 2021 there was no HCR nor HCR tools from the jurisdictions which could have been considered as to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached. As noted in PI1.2.1 the CSMA remain the only participants in the fishery which target the stock consistently on an annual basis and are responsible for the majority share of catches from the stock (Table 11) up to 87% (2019), with a 5 year average of 61.5%.

The stock as of 2021 is considered a Category 3 stock by ICES. As part of ICES's Precautionary Approach to provide advice on the exploitation the stock a responsive HCR (the 1 over 2 rule) is now in place based on a comparison of the most recent index value with the 2 preceding values (ICES 2021a; ICES 2018). However, there will be no implemented HCR tool associated with this and there is concern on the appropriateness of the HCR (see sections 6.1.6.1 and 6.1.6.3 and further below in this rationale).

Prior to 2021 in the absence of a stock wide HCR and HCR tool capable of responding to exploitation rate, the CSMA implemented an annual catch limit to the fleet in 2017 and ensured all members agreed to it through the CSMA Code of Conduct. In response to the PELTIC survey data, for the 2019-2020 season the CSMA used a 20% Harvest Rates (HR) control rule as advised by CEFAS as a baseline for setting their catch limit. The CSMA applied the following methodology to set a total CSMA catch limit:

- 20% harvest rate of the estimated biomass (145,514 t) for the PELTIC 2018 survey year = 29,103 t.
- Calculate UK average catch percentage from 2010-2018 ICES data = 55.3%

- 55% of 29,103 t gives a value of 16,007 t
- CSMA take 95% UK catch so the CSMA used 95% of 16,007 t = 15,206 t as the maximal catch for the fleet for the year. This is the start value from which the harvest control discussion at CSMA was derived.
- For 2019 the CSMA then agreed a catch limit of 10,048 t for the season which is 5,158 t lower than the maximal catch. This value was based on the basic agreement of a minimum of 400 t per vessel. With an uplift of 20% for those vessels actively catching near their 2018 allocation.
- The agreed total catch was to be reviewed in November 2019 to allow reallocation of unused catch back into the pool for all vessels who had not reached 75% of their allocation.

In 2020, on review of the PELTIC survey data for 2019 the total biomass estimate from the survey increased to 375 kt the (highest on record) (CEFAS 2019) and in the absence of new ICES advice (as an ICES category 5 stock at the time the advice was biannual) CSMA voted to maintain the catch limit of 2019 at 10,048 t. Similarly in 2021, with a biomass estimate at 332,098 t (CEFAS 2020b) the CSMA annual general meeting (AGM) voted and implemented a pooled catch limit at 10,483 t for 2021. The CSMA also agreed to maintain a monthly review of catches internally to monitor against the limit.

That the catch limit in 2019 was based on a 20% harvest rate advised by CEFAS and the method of catch limit setting was documented and below the precautionary 20% harvest rate suggests the HCR can be considered in place and well-defined. There is recorded review and agreement of the HCRs in 2020 and 2021 which reference to this original catch limit and the current stock status suggests the HCR is suitably reviewed and would reduce exploitation as PRI is approached. Further as evidenced in the ICES advice from 2021 (ICES 2021d) F has been maintained below F_{MSY} in part due to this HCR (ICES 2021a).

In GSA2.5 MSC state that ‘HCRs will usually include some form of dynamic rule, requiring that a change of some sort will be made in response to a fishery indicator moving above or below one of the trigger reference points.’ HCRs are often applied on a frequent basis, such as with the annual setting of TACs or effort restrictions. Such HCRs respond dynamically to the monitoring data from the fishery with regular adjustments to input/output type management measures (MSC GSA2.5). The code of conduct signed by the CSMA members each year based on the latest advice (CEFAS or ICES) formalises the fishery’s HCR within the context of the HS. Evidently as the CSMA fleet does not constitute the entire subarea 7 sardine fishery which could target the stock there is a question as to whether the leverage associated with the CSMA catch limit is sufficient to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached for the scoring guideposts in this SI. Under MSC FCR2.01 there is guidance as to the question of leverage (the proportion of the stock on which the HCR operates). GSA2.5 MSC state that ‘A reduction of exploitation rate may not always mean that the control rule requires a reduction in “total” exploitation rate, but instead could for instance involve reducing exploitation rate on parts of the stock (e.g., by age or sex).’ Therefore the CAB consider that with a market share of annual catch ~ 65.1 % average (Table 11) the CSMA HCR should be considered sufficient, under the guidance of GSA2.5, to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached, provided it is supported by scientific opinion.

The current ICES guidelines suggest that the average landings of the two most recent years should be used to implement the 1 over 2 rule for the first time to a stock of a short-lived species. In 2022 as detailed in section 6.1.6.1 ICES set its advice basis at 6,906 t based on the 1 over 2 rule (Figure 17). This advice value is not considered appropriate as it may provide an unnecessary low advice for this stock with reference to the WKWEST information (ICES 2021a), subsequent HCR simulations (ICES 2021g) and scientific opinion (see Appendix 8). It is not considered appropriate because the 1over 2 rule assumes exploitation is at or near MSY whilst this stock is only moderately exploited and the starting

point for the 1 over 2 rule is low because of a combination of market forces, the CSMA catch limit and lack of opportunistic harvesting of the stock in the past 2 years. The harvest rate in 2019 (the start point for the HCR) was 1.95%, which is well below the harvest rate in previous years (around 7 % in 2017 and 2018) Table 12 and subsequent HCR simulations (ICES 2021g) showed the 1 over 2 rule could result in catches between 6,906 t and 13,777 t depending on the start point (Table 14). According to CEFAS the 1 over 2 rule start point was never defined by ICES and where the resource is underexploited the 1 over 2 rule penalises the starting point which lowers the advice for the stock. This is the key issue with the ICES HCR on this stock as catches do not track stock size. However, HCR was adopted by ICES by default because no other HCR simulation had been MSE tested within the data limited workshops (ICES 2020d; ICES 2020c; ICES 2021g) earlier that year and ICES notes that the 1 over 2 rule should be considered as a provisional HCR with the aim of achieving a better management approach within ten years (ICES 2021a).

As a result of this lack of appropriateness in the ICES HCR, the CSMA in consultation with CEFAS redrafted the CSMA HCR for 2022 (as below).

This HCR will be used for the period 2022-2024 or until a new ICES process of formulating the advice is agreed (whichever is soonest). The HCR will be re-evaluated by CSMA and Cefas after that period.

Each calendar year:

- 1. The CSMA will set an annual catch limit for the CSMA fleet based on catch history of the CSMA as a proportion of the overall catch of the stock over the preceding 3 years.*
- 2. The CSMA will consult with Cefas if the proposed CSMA catch limit is sustainable and point 3 will be followed:*
- 3. Cefas will evaluate if the proposed catch limit meets the following points:*
 - i. The catch limit likely maintains the overall exploitation rate below F_{MSY} ; and*
 - ii. not likely leads to an overall exploitation rate that would reduce biomass to approach the point of recruitment impairment.*
 - a. If Cefas agree that the CSMA proposed catch limit as laid out under Point 3. i-ii are met, then the proposed harvest rate will be offered to members for acceptance as the CSMA catch limit for the forthcoming calendar year.*
 - b. If Cefas consider that the CSMA proposed catch limit as laid out under Point 3. i-ii are not met, then CSMA will adopt a catch level advised by Cefas which ensures that Point 3 i-ii is met or will follow the ICES HCR, whichever is higher.*
- 4. Where a reduction in catch limits is required by the CSMA under 3.b., the CSMA may choose to limit catch reductions by a maximum of 10% of the previous year's catch limit. This is to avoid large reductions in catch which may have severe socioeconomic impacts in the fishery and could lead to the fishery failing to meet the fishery objective for economic sustainability. Under this scenario the CSMA will request that Cefas evaluate any proposed decrease with respect to whether the reduction can be expected to reduce F below F_{MSY} within a reasonable time frame relevant to the stock. Once a catch limit is agreed between Cefas and CSMA, the proposed harvest rate will be offered to members for acceptance as the CSMA catch limit for the forthcoming calendar year.*

At interview (see Appendix 8) CEFAS confirmed that the CSMA HCR allows for catch limits above the ICES advice (because of the issues in the ICES HCR discussed above) but importantly requires annual ‘approval’ confirmation with CEFAS that the advice is appropriate and does not risk F being too high [$F > F_{MSY}$]. It also contains clauses where if CEFAS do not agree to the CSMA catch proposal in any year for CEFAS to recommend a new level which CSMA will adopt. This should ensure that the catch advice is reduced if RPs are approached. The CSMA HCR has a proposed time limit to 2024 whilst the information that underpins the stock assessment and the ICES HCR is further developed. CEFAS consider that the CSMA HCR should be considered a key HCR tool in the short term with an aim to have an improved ICES HCR by the time of the next interbenchmark.

GSA2.5 MSC state that HCRs should be regarded as ‘well-defined’ in the sense required to achieve an 80 score when they exist in some written form that has been agreed by the management agency, ideally with stakeholders, and clearly state what actions will be taken at what specific trigger reference point levels.

The CSMA HCR can be considered to be well defined and in place (see CSMA and CEFAS agreements in Appendix 11 and Appendix 8). CEFAS as the scientific body responsible for the stock at the UK level and as the lead group in ICES consider the HCR should ensure that the catch advice is reduced if RPs are approached and maintain the catch below F_{MSY} .

As such given all the information above the assessment team consider **SG60 and SG80 are met**.

As the new HCR from CSMA is untested (either empirically or by an MSE etc) and it doesn’t consider the ecological role of the stock **the requirements of SG100 are not met**

b	HCRs robustness to uncertainty		
	Guide post	The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
	Met?	Yes	No

Rationale

At the stock level the main uncertainties preventing HCR development in the fishery before 2021 were resultant of the lack of historic fishery-independent and -dependent data from the entire Subarea 7 region and consequently there has not been an analytical assessment for this stock. However, the WKWEST workshop, concluded that the landings and current availability of the biomass data provided by the PELTIC survey for sardine in Subarea 7 are appropriate to assess the stock and provide advice (ICES 2021a). A biomass safeguard was also estimated based on ICES simulation modelling of small pelagic species and the 1 over 2 rule was tested by MSE. The 1-over-2 rule in place from ICES is considered inappropriate not because of uncertainty, but because of the method of application of the ‘starting point’ see SI a.

From 2018 to 2021 the HCR of the CSMA catch limit was based on the stock biomass derived from the latest survey data and CSMA’s historic proportional catch of the stock. The stepwise allocation of the catch limit for CSMA, shown in SIa for the period, accounted for the uncertainty in the proportion of the CSMA landings to total landings and

added a buffer for the uncertainty thus accounting for the main uncertainties (catch from other sectors and annual recruitment changes). In subsequent years 2019-21 the catch limit has not increased whilst the biomass has increased meaning the buffer to the uncertainty in the proportion of catches has also increased.

For 2022 the CSMA HCR continues the trend of using CSMA's historic proportional catch of the stock and stock biomass derived from the latest survey data but also includes a verification check with CEFAS (the national scientists responsible for the stock) to ensure its precautionary nature. As such it accounts for the main uncertainties (catch from other sectors and annual recruitment changes).

Based on the above SG80 is met.

In regard to the '1-over-2' rule it has been noted that an 80% decrease in advice requires a 500% increase in the following advice to return to the previous level, taking a minimum of three years to achieve when an 80% uncertainty cap is applied (ICES, 2021b). Due to the inability of the rule to take advice back to the previous level after hitting the lower cap, it does not account for a wide range of uncertainties. With regard to the CSMA HCR and the ICES HCR neither account for ecological role of the stock. **SG100 is therefore not met.**

c	HCRs evaluation			
	Guide post	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	Yes	Yes	No

Rationale

A study in 2017 (Carpi & Kooij 2017) and the results of the PELTIC surveys to date (CEFAS 2020b) together with the retrospective analysis of the ICES proposed HCR (1 over 2) suggest that the tools in use have been effective in the recent past (Ouréns, Kooij, et al. 2021; Ouréns, Nash, et al. 2021). The stock is in a good state ($B > B_{MSY}$) suggesting that the harvest control measures in place (from the CSMA) have been beneficial both stock-wide and locally and not overexploited ($F < F_{MSY}$) as required by SA2.5.6. **As such SG60 level and SG80 are met.**

The evidence base is not considered clear because of the wide 95% confidence intervals in the absolute biomass estimate (PI1.1.1a). **SG100 not met.**

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(Carpi & Kooij 2017; CSMA 2017a; CSMA 2019b; CEFAS 2019; CEFAS 2020a; CSMA 2020a; ICES 2021a; CEFAS 2020b; CSMA 2021; ICES 2021d; ICES 2021g; ICES 2021f)

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Appendix 8 and 11

Overall Performance Indicator score	80
Condition number (if relevant)	N/A

Scoring table 4. PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guide post	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Yes	Yes	No

Rationale

Monitoring of the stock status is considered adequate for management needs as evaluated by ICES in the 2021 benchmark (ICES 2021a). The annual PELTIC survey undertaken by CEFAS in the UK (CEFAS 2020b) is now in its 9th season. The survey is known to cover both the core fishing area and the western extent of the stock boundary (section 6.1.4). The UoA continues to implement its self-sampling program which provides fishery dependent length-frequency data and discard into the assessment process, although the time-series of this is weak at present and prevents its use in the current assessment (CEFAS 2020a). Catch data is reported by all EU member states under the requirements of the Common Fishery Policy (CFP) and by the UK as part of its UK MoU with ICES (UK 2021a). Catch information is variable over time by member state and it is not clear if this variability was caused by the opportunistic nature of some fleets or by misreporting (ICES 2021a). Indications from both the PELTIC survey and the outputs of the SPiCT model show that, based on quarterly data on the sardine landings and the biomass estimated in the core area from 2013 to 2020, the stock is in a good state. Data is collected from all member states and moreover, the stock continues to show strong signals of increase and there have been continued improvements in data recording in the fishery including the self-sampling program. **SG60 is met.** The WKWEST data compilation workshop, held from 14 to 18 September 2020, concluded that the landings and current availability of the biomass data provided by the PELTIC survey for sardine in Subarea 7 are appropriate to assess the stock (ICES, 2021a). **SG80 is therefore met.**

However, the benchmark concluded that it is not appropriate to provide advice given the high uncertainty associated to the absolute values of biomass, fishing mortality and reference points as the data series is still short and other information such as environmental information are not explicitly considered. **SG100 is therefore not met.**

b	Monitoring			
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	Guide post	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Yes	Yes	No

Rationale

For the stock under assessment, relative abundance is measured using the annual PELTIC survey undertaken by CEFAS in the UK (CEFAS 2020b). The survey is known to cover both the core fishing area and the western extent of the stock boundary (section 6.1.4). The UoA removals are provided through good logbook compliance (monthly reports and reviews by the CSMA) for the target stock to the MMO and made available to ICES (section 6.2.3). The UoA continues to implement its self-sampling program which provides fishery dependent length-frequency data and discard into the assessment process (CEFAS 2020a) although these are not used in the stock assessment at present (ICES 2021a). These data sources are monitored routinely and catch data are sufficient for ICES to provide advice. Non-UoA data is supplied to ICES by EU member states and although some uncertainty exists (see Slc) the WKWEST data compilation workshop, concluded that the landings and current availability of the biomass data provided by the PELTIC survey for sardine in Subarea 7 are appropriate to assess the stock (ICES 2021a). Consequently, the availability of the biomass data to assess the stock has implied an upgrade of stock category, being now classified as category 3. The CSMA review the catch limits (HCR) annually against their catch records and those held by ICES to provide information on proportionality of catch. As such stock abundance and coverage is considered accurate and regular and informs the basis for the HCR from more than one source **SG60 and SG80 level is met**. Given the uncertainty associated to the absolute values of biomass, fishing mortality and reference points **SG100 is not met**.

c	Comprehensiveness of information			
	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		Yes	

Rationale

Reported catches by country are very variable over time and across ICES divisions, and up to 2021 it was not clear if this variability was caused by the opportunistic nature of some fleets or by misreporting. The WKWEST data compilation workshop concluded the high variability is primarily explained by shifts in fleets activity and species targeted over the years and the catch data quality was considered sufficient to apply ICES category 3 advice (ICES 2021a; Ouréns, Kooij, et al. 2021). Sardine is the main target species for some of the fleets, whereas it is a bycatch species for others. Some fleets are also opportunistic, and they only target sardine when the abundance or the quota of their

main target species is low. Variations in the relative abundance of pelagic species, the market, and the fishing opportunities have driven the variability observed in sardine landings over time. Based on the ICES data analysis and conclusions from 2021 **SG80 is met.**

References

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Overall Performance Indicator score	80
Condition number (if relevant)	N/A

Scoring table 5. PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		No	No

Rationale

The WKWEST data compilation workshop of 2021 concluded that the landings (including that of the UoA) and the biomass data provided by the PELTIC survey for sardine in Subarea 7 are appropriate to assess the stock and provide advice. The extension of the PELTIC survey from 2017 provides good coverage of the stock distribution, and the area where the majority of the fishery happens (ICES 2021a). In addition, the short time-lag between the survey observations (October) and the assessment (November) further support the use of PELTIC biomass estimates as input data for stock assessment.

The availability of the biomass data to assess the stock now allow the stock to be classified as category 3 and the benchmark panel agreed that a SPiCT model should be used to assess the status of the stock based on the relative biomass and fishing mortality to the reference points (B_{MSY} , F_{MSY}). However, ICES (2021a) acknowledged that the estimates of absolute biomass (B), fishing mortality (F) and the reference points (F_{MSY} and B_{MSY}) provided by the model were considered unreliable, and therefore, the catch advice would be based on the biomass trend estimated with the data provided by the acoustic survey PELTIC. The benchmark provides a biomass safeguard from the historical biomass index in the ‘total area’ of the stock and set it at 109,965 t. If the biomass index fell below this value, the benchmark recommended that the advised catch should be reduced in proportion to the drop. The major features of the target stock are its distribution which is accounted for in the PELTIC survey and its short life-span which is accounted for in the model type (SPiCT models have been designed and MSE tested on simulated sardine stocks (ICES 2020d)). The UoA supply logbook data and fishery dependent length-frequency data and discard into the assessment process, although the time-series of this is weak for the length frequency at present and prevents its use in the current assessment (CEFAS 2020a), this is covered by the survey data.

The starting point for the 1 over 2 rule is low because of a combination of market forces, the CSMA catch limit and lack of opportunistic harvesting of the stock in the past 2 years. ICES adopted and tested the 1 over 2 rule on the assumption that the exploitation rate at the point at which the HCR is applied is at or near MSY whilst for the sardine stock it was only moderately exploited in recent years and therefore higher fishing mortality ($>F$ in 2019 and 2020 but $<F_{MSY}$) would have resulted in higher advice without compromising the status of the stock. Clear evidence of this comes from the harvest rate in 2019 (the start point for the HCR) which was 1.95%, which is well below the harvest rate in previous years (around 7% in 2017 and 2018) (Table 13) and which CEFAS consider well below the rate the stock can accommodate (CEFAS - Appendix 4 - HR

with values of 9 -10% don't usually impact a stock. From a survey you estimate the catchability of the stock and for sprat (in subarea 7) at 10% was considered precautionary [as an example]). Given this fishing pattern, if the 1 over 2 rule is applied to recent landings, the catch advice is unnecessary low (ICES 2021a) (ICES 2021g) and ICES showed the 1 over 2 rule could result in catches between 6,906 t and 13,777 t depending on the start point Table 14 (ICES 2021g). According to CEFAS the key issue with the ICES HCR on this stock is that catches do not track stock size. However, this HCR was adopted by ICES by default because no other HCR simulation had been MSE tested within the data limited workshops. Alternative approaches to implementing this rule for the first time in sardine in Subarea 7 were discarded as they deviated from the recommended practice (ICES 2020d; ICES 2021g) and ICES notes that the rule should be considered as a provisional HCR with the aim of achieving a better management approach within ten years (ICES 2021a).

Whilst the ICES HCR is not considered appropriate the CSMA and CEFAS HCR utilises the assessment information to define the catch limits and requires annual 'approval' confirmation with CEFAS that the advice is appropriate to the current stock status and the reference points. As such the assessment is capable of providing an appropriate HCR. The HCR allows for catch limits above the ICES advice (because of the issues in the ICES HCR, discussed above) but importantly requires annual 'approval' confirmation with CEFAS that the advice is appropriate and does not risk F being too high (above F_{MSY}).

Overall the team felt that although the CMSA HCR was the one with the associated HCT tool and is based on the stock advice may be considered appropriate for the stock, because the ICES advice basis is based on an inappropriate harvest rate calculation it cannot be said that the assessment is appropriate for the HCR (1 over 2 rule) ICES use and therefore **SG80 is not met**.

b	Assessment approach		
	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.
	Met?	Yes	Yes

Rationale

The species category ICES sees sardine belonging to is the data-limited short-lived species group (<https://www.ices.dk/community/groups/Pages/WKDLSSL5.aspx>). The model type assigned to this stock is a SPiCT model which have been designed and MSE tested on simulated sardine stocks (ICES 2020d). The model tested and carried to review in the ICES benchmark allows the assessment of stock status based on the relative biomass and fishing mortality to the reference points (B_{MSY} , F_{MSY}). The benchmark provides a biomass safeguard from the historical biomass index in the 'total area' of the stock which is a proxy to PRI. **SG60 and SG80 are met**.

c	Uncertainty in the assessment
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	Guide post	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Yes	Yes	No

Rationale

The major sources of uncertainty in the stock assessment are identified as the absolute values of biomass and fishing mortality and accounts for these by providing biomass and fishing mortality and reference points in relative terms. The internal ICES review of the assessment (ICES 2021a) notes that: Several configurations of seasonal SPiCT using quarterly catches and survey biomass index of core area were tested. Attempts were made to get rid of the seasonal variation in biomass estimated by the model. Sensitivity analyses with different starting depletion levels for the timeseries were carried out. The group found a level of 50% as adequate and supported the use of such modelling configuration for providing proxy MSY reference points to indicate stock status. **SG60 and SG80 are met. SG100 is not met** because confidence intervals for absolute estimates cannot be provided.

d	Evaluation of assessment			
	Guide post	The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.		
	Met?	Yes		

Rationale

The assessment has been tested through the workshop of WKWEST and testing of alternative models is shown for the simulated stocks in data-limited short-lived species group (<https://www.ices.dk/community/groups/Pages/WKDLSSL.aspx>) (ICES 2020d). The WKWEST report notes that several configurations of seasonal SPiCT using quarterly catches and survey biomass index of core area were tested. Attempts were made to get rid of the seasonal variation in biomass estimated by the model. Sensitivity analyses with different starting depletion levels for the timeseries were carried out. The report also highlights that the assessment methods evaluated in this benchmark have been recommended for data-limited stocks of short-lived species by ICES and the guidelines published for SPiCT have been also followed to perform the SPiCT model (Mildenberger et al., 2020 cited in (ICES 2021a)). **SG100 is met.**

e	Peer review of assessment		
	Guide post	The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?	Yes	No

Rationale

The WKWEST report includes a review undertaken on the assessment which concludes ‘ The choice of proceeding with the SPiCT modelling was considered appropriate to provide additional information on the status of the stock.’ **SG80 met.**

There has been no external review to date **SG100 is not met**

References

(ICES 2021a; Ouréns, Kooij, et al. 2021; Ouréns, Nash, et al. 2021), (ICES 2020d), (ICES 2021g) and scientific opinion (see Appendix 8)).

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Overall Performance Indicator score	75
Condition number (if relevant)	1

6.2 Principle 2

6.2.1 Designation of species under Principle 2

Primary species (MSC Component 2.1) are defined as follows:

- Species in the catch that are not covered under P1;
- Species that are within scope of the MSC program, i.e. no amphibians, reptiles, birds or mammals;
- Species where management tools and measures are in place, intended to achieve stock management objectives reflected in either limit (LRP) or target reference points (TRP). Primary species can therefore also be referred to as ‘managed species’.

Secondary species (MSC Component 2.2) are defined as follows:

- Species in the catch that are not covered under P1;
- Species that are not managed in accordance with limit or target reference points, i.e. do not meet the primary species criteria;
- Species that are out of scope of the programme, but where the definition of ETP species is not applicable (see below)

ETP (Endangered, Threatened or Protected) species (MSC Component 2.3) are assigned as follows:

- Species that are recognised by national ETP legislation
- Species listed in binding international agreements (e.g. CITES, Convention on Migratory Species (CMS), ACAP, etc.)
- Species classified as ‘out-of scope’ (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).

Both primary and secondary species are defined as ‘**main**’ if they meet the following criteria:

- The catch comprises 5% or more by weight of the total catch of all species by the UoC;
- The species is classified as ‘Less resilient’ and comprises 2% or more by weight of the total catch of all species by the UoC. Less resilient is defined here as having low to medium productivity, or species for which resilience has been lowered due to anthropogenic or natural changes to its life-history
- The species is out of scope but is not considered an ETP species (secondary species only)
- Exceptions to the rule may apply in the case of exceptionally large catches of bycatch species.

6.2.2 Data availability

6.2.2.1 Logbooks and processor records

Based on the information available from the UoA and externally verified sources the fishery continues to be a clean target species dominated fishery. Records of landed catch composition from the UoA are

available from the CSMA logbooks and processor records (Table 15). Sardine remains the dominant catch and all other species were less than 5% of the landed weights from 2014 -2021 (Table 15).

Table 15. Bycatch small pelagic species landing in tonnes and MSC classification under Principle 2. Note: none of these stock conform to the classification of less resilient as per FCR 2.021 - SA3.4.2.2. Source CSMA logbooks and processor records

Year and percentage of landings	Sardines	Anchovy	Sprats	Herring	Mackerel	Scad	Total
	<i>Sardina pilchardus</i>	<i>Engraulis encrasicolus</i>	<i>Sprattus sprattus</i>	<i>Clupea harengus</i>	<i>Scomber scombrus</i>	<i>Trachurus trachurus</i>	
2020-21	8,808.3	154.8	0	0	13.2	5.3	8,981.7
%	98.1	1.7	0.0	0.0	0.1	0.1	
2019-20	6,386.0	72.0	1.0	0	30.7	108.8	6,598.5
%	96.8	1.1	0.0	0.0	0.5	1.6	
2018-19	6,649.2	289.0	0.0	0.0	33.4	2.0	6,979.5
%	95.3	4.1	0.0	0.0	0.5	0.0	
2017-18	6,675.0	32.2	10.2	8.9	61.5	4.0	6,791.7
%	98.3	0.5	0.1	0.1	0.9	0.1	
2016-17	6,740.5	139.0	0.0	0.4	7.6	8.9	6,896.4
%	97.7	2.0	0.0	0.0	0.1	0.1	
2015-16	4,662.8	20.4	2.8	239.5	44.5	0.4	4,970.4
%	93.8	0.4	0.1	4.8	0.9	0.0	
2014-15	3,670.9	366.0	64.3	245.8	28.9	3.6	4,379.5
%	83.8	8.4	1.5	5.6	0.7	0.1	
MSC classification	Target	Secondary Minor	Secondary Minor	Secondary Minor	Primary Minor	Primary Minor	

Bycatch of other species (non-small pelagic stocks) are available from logbook records also and these show catches across all species totalling approximately 2.6 t for non-ETP catches. The value here is somewhat uncertain as catches of single specimens of these species were often recorded by unit rather than weight particularly if they are required to be returned to the sea e.g. blue fin tuna (Table 16).

Table 16. Bycatch non-small pelagic species landings in kilograms or counts where relevant. Classification under the MSC classification - Principle 2 are shown. * Source CSMA logbooks and processor records.

Species	2020-21 volume by weight (kg) or unit	Fate and comments	MSC classification
Seabass (<i>Dicentrarchus labrax</i>)	335	Discarded – Under EU legislation ring netting is not an authorised gear for seabass and have to be legally discarded	Secondary Minor

Species	2020-21 volume by weight (kg) or unit	Fate and comments	MSC classification
Tuna (unspecified)	1 individual	unknown	Secondary Minor
Whiting (<i>Merlangius merlangus</i>)	515	landed	Secondary Minor (no stock assessment in division 7e, h, g)
Sole (<i>Solea solea</i>)	16	landed	Primary Minor
John dory (<i>Zeus faber</i>)	80	landed	Secondary Minor
Plaice (<i>Pleuronectes platessa</i>)	44	landed	Primary Minor
Pollack (<i>Pollachius pollachius</i>)	2	landed (depending on size & quantity)	Secondary Minor
Hake (<i>Merluccius merluccius</i>)	3	landed (depending on size & quantity)	Primary Minor
Bonito (<i>Sarda sarda</i>)	12 individuals	landed (depending on size & quantity)	Secondary Minor
Small eyed ray (<i>Raja microocellata</i>)	314 individuals Average weight is 4.5 kg therefore total is ~1.4 t	landed	Secondary Minor
Cuttlefish (<i>Sepia officinalis</i>)	1 individual	landed (depending on size & quantity)	Secondary Minor
Bluefin tuna (<i>Thunnus thynnus</i>)	7 individuals	Released alive (from 2021 licence variation allows vessels to land 1 per trip)	Primary Minor
Sunfish (<i>Mola mola</i>)	4 individuals	released	Secondary Minor
Electric ray (<i>Torpedo marmorata</i>)	1 individual	Unknown (most likely released)	Secondary Minor
Black back gull (<i>Larus marinus</i>)	2 individuals	Released alive	ETP
Gull (unspecified)	11 individuals	Released alive	ETP
Bird unknown	4 individuals	Released alive	ETP
Common dolphin (<i>Delphinus delphis</i>)	2 individuals	Released alive	ETP
Harbour porpoise (<i>Phocoena phocoena</i>)	3 individuals	Released alive	ETP
Seal (<i>Halichoerus grypus</i>)	2 individuals	Climbed over headline and then released alive	ETP

6.2.2.2 Slippage

Slippage continues to occur within the fishery as a method of reducing unwanted catch whilst lowering mortality rates. This is permitted in this fishery (UK 2021b) and is referenced in the CSMA Code of Conduct (CSMA 2020b). It is recorded in the CSMA logbooks by estimating the weight slipped and species composition. There is evidence that slippage has been reduced in recent years by increased use of shared catches, where one vessel calls in a second ring-netting vessel to pump from their net when they have caught too many sardines and this action is also recorded in logbooks of both vessels, although it is not known if this is done systematically.

Slippage activity is reported in the self-sampling program under the FSP project from the fishery and summarised in Rodríguez-Climent et al. (2021) by month (Table 17). From the logbooks seven of the fleet's 12 active vessels report slippage events in 2020-21 with an estimated total of 283.6 t (Table 18). This is a reduction from 2019-2020 estimated at 317 t total. The 2019 data includes an incident where the vessel found itself too close to shore in poor weather and had to abandon its net. The net was later recovered (Jones et al. 2020). The slipped composition is similar between years except for anchovies where they were landed to market in 2019, but without market value in 2020 they were slipped if caught.

In total, slippage represented 3.0% of the total catch in 2020 compared to 4.6% in 2019 with values similar to percentages found in previous years for the fishery (2.9% in 2018 11 of 15 vessels reporting slippage events) (Jones et al. 2018; Jones et al. 2019; Jones et al. 2020). There were no reports of mass stranding of slipped fish for the season 2019 (MMO, Daisy May pers. comm. reported in Jones et al. (2020)) which offers qualitative evidence that the measures implemented are being effective. For 2020 and 2021 this information also confirmed by the authorities at the site visit (C. Elson pers. Comm. MMO).

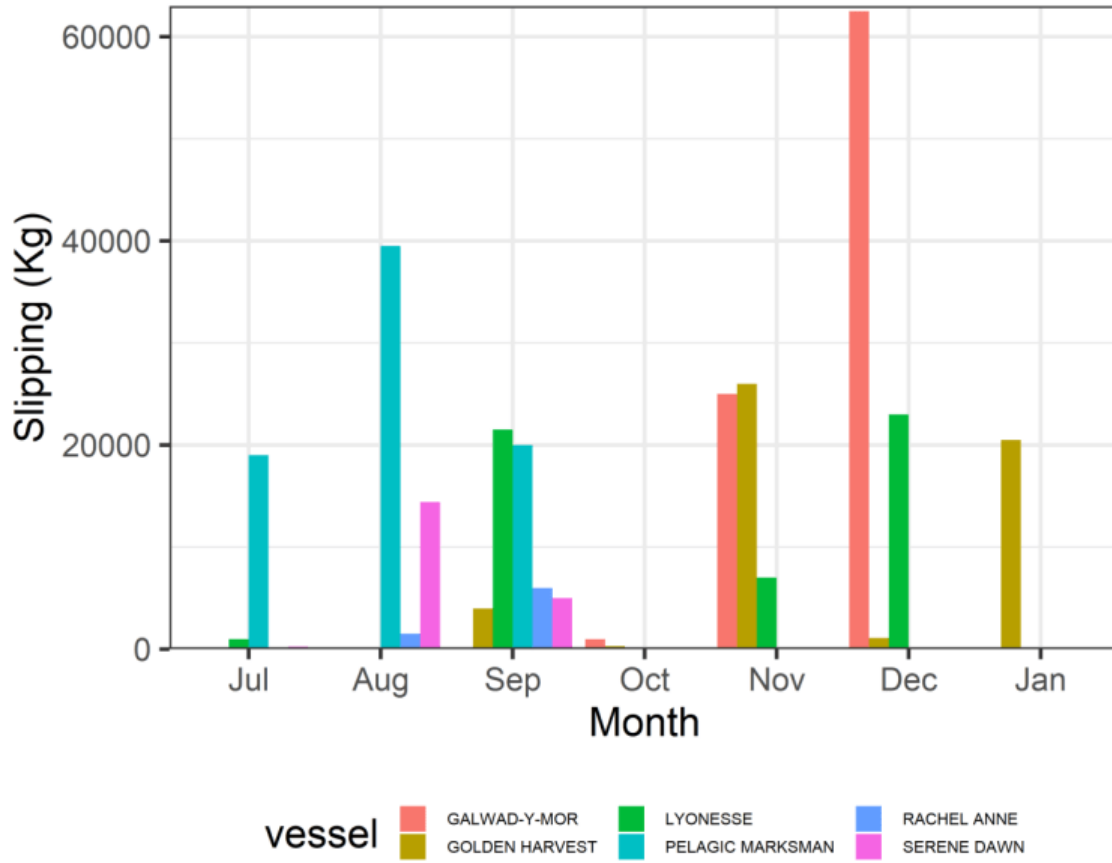


Table 17. Recorded slipping practices by vessel and month during the sardine fishing season. Source Rodríguez-Climent et al. (2021).

Table 18. Slippage estimates and percentage contributions for 2018-2020. Source: CSMA logbooks.

species	SLIPPED COMPOSITION (t) & %					
	2018 weight (t) and %		2019 weight (t) and %		2020 weight (t) and %	
HERRING	0	0.0	0	0.0	0	0.0
BASS	0.2	0.1	0.5	0.1	0.3	0.1
SCAD	2	1	70.274	17.0	20.2	7.1
SPRAT	28.5	14	0	0.0	0	0.0
MACKEREL	17	8	0	0.0	0	0.0
ANCHOVY	0	0	0	0	75.5	26.6
WHITE BAIT	1.1	1	20.5	5.0	0	0
SARDINE	206.3	76.1	321.05	77.9	187.5	66.1
TOTAL	206.3		412.3		283.6	

6.2.2.3 Slippage management and information

The knowledge base of survival from slippage for sardines remains the work of Catchpole et al. (2015) the client group noted during the Year 1 audit in 2018 (Jones et al. 2018) that CSMA follow the high survivability protocol described in this paper. Although this is not explicitly written in the fishery Code of Conduct, it is formalised in the CSMA slippage policy (CSMA 2017b; CSMA 2020b). The policy follows the high survivability exemptions in place for herring and mackerel targeted fisheries within the EU, which requires that herring should be released at the latest when 80% of the net is aboard and mackerel at or before 90%. The CSMA therefore advise that all vessels attach visible markers to nets at 80% and 90% allowing easy identification of these points during hauling (CSMA 2017b). This was confirmed at the site visit on CSMA vessels. Shared catches, where one vessel calls in a second ring-netting vessel to pump from their net when they have too many sardines, is permitted in this fishery and is encouraged in the Code of Conduct. *'Members shall endeavour to ensure their fishing activities prevent overfishing and excess fishing capacity and not lead to more fish being caught than can be safely carried by the available vessels. Skippers shall communicate with nearby vessels at every opportunity to manage larger catches. In the event of an excessive catch which cannot be shared with another vessel, fish in the net should be released alive at the earliest possible point in the fishing operation.'* (CSMA 2017a).

As a non-TAC species there is no regulatory requirement for the recording of sardine slippage from the authorities, but it is recorded by the CSMA in the log sheets as described above. Slippage of non-target species which are subject to TACs is permissible under a UK statutory instrument in The Sea Fisheries (Amendment etc.) (No. 2) Regulations 2021 (UK 2021b). Specifically, this instrument is a derogation from Article 15(1) of Regulation (EU) No 1380/2013. Therefore the landing obligation does not apply to catches of mackerel, horse mackerel, herring and sprat in the ring net fishery when targeting pelagic species not subject to quotas in ICES divisions 7e and 7f.

In a meeting held by the CSMA in February 2020 (CSMA 2020d) there is evidence of discussion of alternative measures to help with reducing accidental mortalities from slippage events these were:

- Best to release fish before brailing of pumping begins;

- Trying to release fish early in process;
- Setting up a committee to review incidents; and
- Possible sanctions for vessels not abiding by CoC.

Gear modifications were also discussed:

- Reduce net floatation;
- V-cut bunt end making easier to spill fish;
- Reducing net length;
- Multicoloured bunts to mark fish volumes; and
- Possible use of cameras onboard for monitoring.

A number of these actions were taken forward from this and other meetings. Actioned items include the implementation of the CCTV on all vessels (section 6.2.2.5), some vessels adding V-cut bunt end making easier to spill fish and other vessels adding a slip ring system at the end of the net to allow slipping from the end of the net rather than over the headline (Figure 22) footage of this system is available to view in the video link provided in section 4.2.2.



Figure 22. An example of the slip ring system onboard a CSMA vessel. A rope threaded through the rings allows release of fish to be slipped from the end of the net rather than over the headline. This reduces risk of potential damage to the fish. Source: CU UK.

6.2.2.4 Observer data

At the last PCR (Cieri et al. 2017) it was noted that there had been some sporadic independent observations of the ring-net fishery in relation to cetaceans between 2005 and 2014. The Sea Mammal Research Unit (SMRU) had coordinated nine days of monitoring on ring-net vessels to fulfil obligations under the Habitats Directive, with no record of any sea mammal interactions within three reports between 2006 and 2011 as reported in Cieri et al. (2017). Some observations were also made in 2014 through a pilot project run by CEFAS. This also reported no incidental capture of marine mammals (Northridge et al. 2016). The CEFAS slipped catch survivability trial which accompanied a fishing trip in

January 2015 also observed no sea mammals (Personal Communications, Tom Catchpole, CEFAS, 16 October 2015 reported in Cieri et al. (2017)).

In 2018, a routine observer program run by Sea Mammal Research Unit (SMRU) began for the UoA after initial discussions were held with the CSMA and with the subsequent agreement of the Bycatch Monitoring Program (BMP) steering group. The purpose of this sampling is to independently quantify protected or sensitive species interactions with CSMA fishing vessels during the course of their normal fishing operations. The skippers and owners of all vessels in the CSMA pre-agreed to carry observers whenever asked and the fishery is sampled using a port-based stratified random vessel selection procedure wherever possible with target days (20 days per annum) spread across the duration of the fishing season.

The SMRU remit includes observations on seabirds, marine mammals, reptiles and protected fish (including elasmobranch's). The SMRU observer programme (funded through DEFRA) is the UK Protected Species Bycatch Programme (UKBP) which fulfilled the UK monitoring and mitigation obligations for marine mammals under EC Council Regulation 812/2004. It also fulfils similar obligations for the EU Habitats and Bird Directives, Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS) the International Convention on the Regulation of Whaling (ICRW) and the Oslo and Paris Conventions (OSPAR) (SMRU 2018).

In 2018, 13 days were observed due to delays in protocol agreement and the short sampling period between September and December (SMRU 2018). The 13 days accounted for approximately 2% of the sea days for the fleet for the 2018 season. All samples (5 vessels, 15 hauls) were from Mounts Bay in Cornwall in 2018. The only ETP interactions recorded through the observer programme were with herring gulls (*Larus argentatus*) protected through the Wildlife and Countryside Act 1981 (UK 2008) (SMRU 2018). There were six separate encounters with the gulls and the observer summary report notes that all animals were released alive with three dried out on the vessel prior to release (SMRU 2018). The report also notes that on one trip the vessel captain did not shoot the net on account of bluefin tuna and then common dolphins in close vicinity.

In 2019, 14 days observations were made across 4 months (40% of months fished) and 6 vessels (50% of vessels active in 2019) (SMRU 2019). The data for 2019 shows a single herring gull (*Larus argentatus*) was recorded as bycatch and was dead on retrieval to the vessel. No other protected species bycatch was recorded.

In 2020, due to social distancing requirements (COVID -19) SMRU suspended all observer programs and no at-sea data collection was available for the 1st few months of 2020. Sampling was restarted in the summer of 2020 for the remainder of the season. The 20 days sampling achieved in 2020 and 2021 were undertaken during 14 trips on 4 different vessels and totalled 16 observed hauls (SMRU 2022). On several trips the gear was not deployed, either due to a lack of suitable marks or because of shoals dispersing before the gear could be shot. The commercial catch was overwhelmingly of pilchard, with a small, retained bycatch of horse mackerel, mackerel and anchovy in three hauls. During one trip some catch was also pumped aboard the observed vessel from another boat. No ETP bycatch mortality was recorded during any of these operations. The SMRU reported that the observer has had no problems arranging trips with skippers in the fishery and we continue to have 100% access to boats when trips are requested (A. Kingston pers comm.).

Table 19. SMRU observer sampling and recorded bycatch records for 2020 and 2021. * all seagulls released alive. Source: SMRU (2022)

Year	Month	Sampled days	Sampled hauls	Area	Target	Marine mammals	Seabirds
2020	1	2	0	7f	Pilchard	0	0
	3	1	0	7f	Pilchard	0	0
	11	3	2	7f	Pilchard	0	0
	12	4	1	7f	Pilchard	0	0
2021	2	1	2	7f	Pilchard	0	0
	3	3	3	7f	Pilchard	0	0
	8	1	2	7f	Pilchard	0	0
	9	3	2	7f	Pilchard	0	5*
	10	2	4	7f	Pilchard	0	0

6.2.2.5 CCTV

A CCTV system was agreed to be fitted by all member vessels for the start of the 2020-21 season and is now in place (Figure 23). Testing of the adequacy of the CCTV system on vessels was completed by Cornwall IFCA who signed off the camera view/angle and quality of image based on submitted still images (Figure 24). The camera specification was set so that images would be collected and stored for a minimum of a month to allow images to be viewed retrospectively if required. The CCTV records vessel activity and in the case of any issue raised against the vessel will be reviewed by an independent panel (a member of the Cornwall IFCA and/or Cornish Fish Producers Organisation + an industry expert). The CCTV has been fitted by members to prove compliance with the CSMA code of conduct but will only be used if an issue or allegation arises, there is no legal requirement for the cameras.

To date a single incident where a CSMA vessel was accused of dumping fish close to the shore has occurred. The vessel in question gave access to the CCTV to the independent panel, who viewed the relevant footage and was happy that the video proved that the accusation was untrue. At the site visit the management authorities (MMO and IFCA) acknowledged the efforts made by the industry to install the systems and confirmed that they were able to request footage (should it be required).

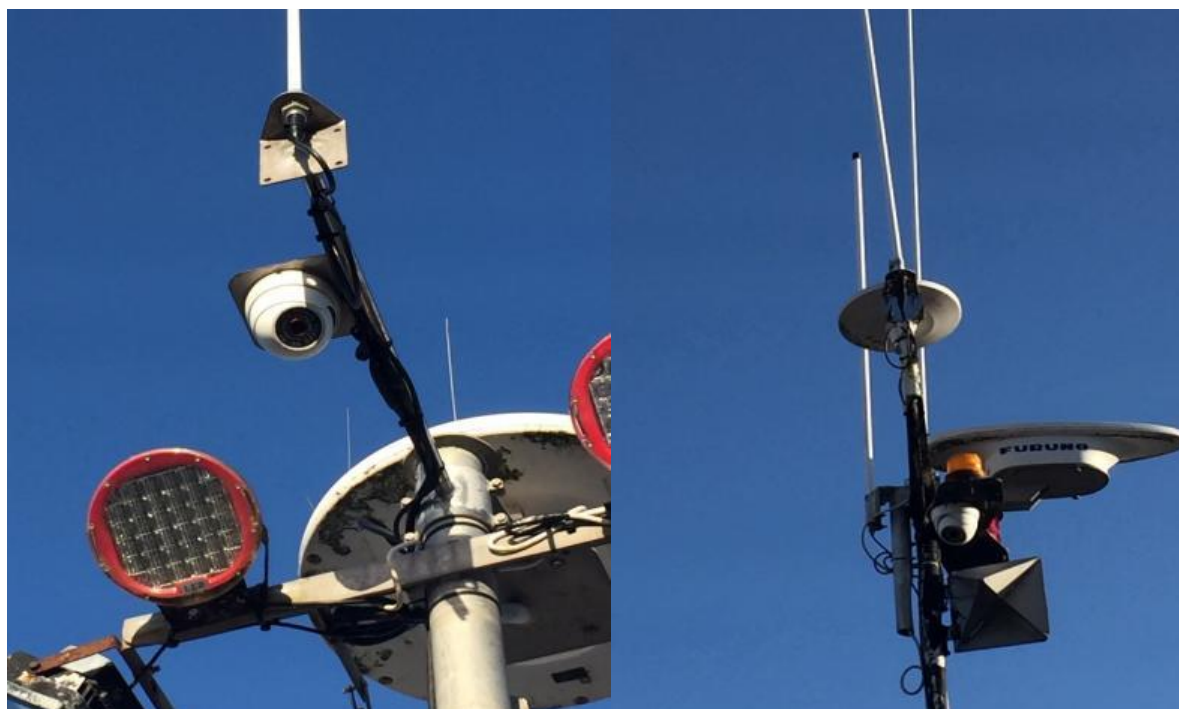


Figure 23. CCTV fitted to two CSMA vessels. Source: CU UK.



Figure 24. CCTV still image taken from an onboard display in a CSMA vessel wheelhouse during a hauling event. Source CU UK.

6.2.3 CSMA Logbook compliance

The year 3 surveillance report for the fishery reported that logbook compliance for the fishery was on the whole good however, ETP recording was missing/incomplete for five vessels and slipping/discards not recorded in three vessels (Jones et al. 2020). Following that audit, the CSMA intend to go back to the skippers and try to ensure that the logbooks were completed in the future. An analysis of the 2020

data shows some improvement by individual vessels, but ETP and discard recording remain the principal areas of poor recording (Table 20). Two vessels don't appear to have followed the logbook reporting methods of CSMA in 2020. At the site visit the CSMA noted that the two vessels with missing records were being skippered by new captains in this season and the CSMA would continue with information and education sessions with the new captains (CSMA data officer pers. Comm.). The CSMA also noted that the vessels with poor reporting are not full time in the fishery and some barely fished in 2020. The CSMA logbooks are completed by the vessels in addition to the official logsheets completed for the MMO records. Non-completion of the CSMA logs is therefore not a non-compliance issue but reduces the assurance level in the catch profile of the CSMA.

Table 20. Logbook compliance summary for 2020. Green = complete, yellow = blank cells missing some zero's etc, Red = Missing / no entries. Source: CU analysis of CSMA logbooks.

VESSELS	LOCATION	DEPTH	NON-SARDINE PELAGIC RETAINED	NON-PELAGIC RETAINED	SLIPPINGS RECORDED	DISCARDS RECORDED	SEATIME HRS (INC NO CATCH TRIPS)	ETP RECORDED	NOTES
ASTHORE				all zeros	all zeros	all zeros		Bird interactions recorded	Comments on activities provide insight into vessel activity
CHARLOTTE CLARE				all zeros	all zeros	all zeros		Blank cells	All other columns have zeros entered except ETP suggesting data not inputted rather than no interactions.
GALWAD Y MOR				all zeros				Blank cells	Blank cells for ETP but significant volume of notes and blanks in other columns (bycatch and slipped) included suggest that these are zeros not incomplete records.
GOLDEN HARVEST									
LYONESSE								Blank cells	Blank cells for ETP but significant volume of notes and blanks in other columns (bycatch and slipped) included suggest that these are zeros not incomplete records.
MAYFLOWER				Blank cells	Blank cells	Blank cells		Blank cells	Blank cells for ETP, non-pelagic bycatch/slippage and discards
PELAGIC MARKSMAN								Dolphin / Tuna interactions recorded	Most active vessel in the UoA and most complete logbook.
PRIDE OF CORNWALL									No data beyond sardine landings (as per processors records) shown to assessment team

VESSELS	LOCATION	DEPTH	NON-SARDINE PELAGIC RETAINED	NON-PELAGIC RETAINED	SLIPPINGS RECORDED	DISCARDS RECORDED	SEATIME HRS (INC NO CATCH TRIPS)	ETP RECORDED	NOTES
RACHEL ANNE								Blank cells	Blank cells for ETP but significant volume of notes and blanks in other columns (bycatch and slipped) included suggest that these are zeros not incomplete records.
RESOLUTE									No data beyond sardine landings shown to assessment team
SERENE DAWN				Blank cells		Blank cells		seal and bird interactions recorded	Blank cells for non-pelagic retained and discard catch may be zeros
VESTA				Blank cells	Blank cells	Blank cells		Blank cells	Blank cells for ETP, non-pelagic bycatch/slippage and discards

6.2.4 Primary and secondary species

Within the previous PCR (Cieri et al. 2017) herring (*Clupea harengus*) and anchovy (*Engraulis encrasicolus*) were considered ‘main’ on a precautionary basis because in individual years the landing of these species may have exceed 5% but over a time period of 5 years they average < 5% (Cieri et al. 2017). Analysis of the updated landing figures at this assessment and better information on slippage events (section 6.2.2.2) suggests there is no evidence of these species exceeding 5% in the past 5 years (Table 15 and Table 18).

In review of all the data sources, no stocks meet the requirements of SA3.4.2 or SA3.7.1 and therefore there are no main species under consideration in this assessment for Primary and Secondary components.



Figure 25. Sardine (top), mackerel (middle) and anchovy (bottom) taken at the site visit from a January catch of a CMSA vessel. Source CU UK.

6.2.4.1 Primary minor species

Based on the information provided in section 6.2.2 the assessment team determined that sole, mackerel, horse mackerel, plaice hake and Atlantic bluefin tuna are primary minor species. The relevant stock and current stock status is provided in Table 21. Key management measures for relevant Primary minor species is discussed below Table 21.

Table 21. Primary minor species and stock status.

Primary species/stock	Reference latest ICES advice	Status
Sole Division 7.e	ICES (2021e)	$F < F_{MSY}$, $B > MSY_{trigger}$
Mackerel NE Atlantic	(ICES 2020b)	$F < F_{MSY}$, $B > MSY_{trigger}$
Horse Mackerel Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k (Northeast Atlantic)	(ICES 2021b)	$F > F_{MSY}$, $B \sim B_{lim}$,
Plaice Division 7.e	ICES (2021c)	$F > F_{MSY}$, $B > MSY_{trigger}$
Hake - Northern stock	ICES (2021d)	$F > F_{MSY}$, $B > MSY_{trigger}$
Atlantic bluefin tuna	ICCAT (2019)	Overfishing = no. Stock \sim MSY based on F proxies

Mackerel

Catches of mackerel (Primary minor species) (Table 15) remain well inside the 15% catch limits required for regulated gears fishing within the mackerel box, which overlaps 100% with the UoA (Figure 26). The mackerel box regulation is monitored closely by the MMO with port landings observed for compliance. The MMO at interview in the site visit confirmed that there were no breaches of this regulation in recent times (C. Elson MMO pers. Comm.).

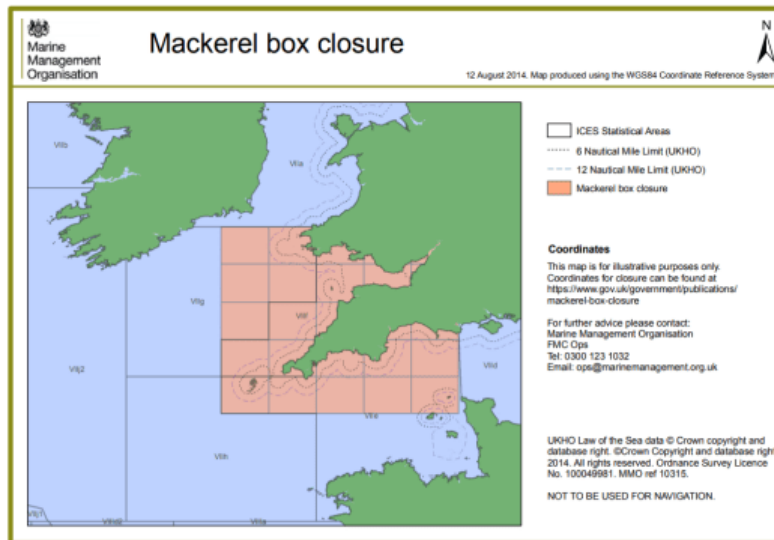


Figure 26. Mackerel box in Southwest England which covers the entire extent of the UoA. Source: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/342783/Mackerel_boxes.pdf

Bluefin tuna

There was some previous evidence of occasional catches of Eastern stock Atlantic bluefin tuna (*Thunnus thynnus*) from the fishery. Potentially the result of improvement to the tuna's stock status (ICCAT 2017) in the past decade. These catches appear in the vessel logbooks and have to be released alive, if possible under ICCAT regulations as the UK had no quota for these species up to 2020. In response to the reports of occasional catches the MMO officer provided clarity to CMSA by email in July 2019 of what needed to occur if these tunas were captured (Daisy May pers comm). To CSMA 'If you catch Blue Fin Tuna as bycatch, release if alive, if dead inform MMO office, MMO will arrange for BFT to be disposed of via Exeter University or by other means into non-human food chain. Any other actions may constitute an offence being commissioned.' These steps were repeated to the CAB via telephone interview as part of the year 3 audit (Jones et al. 2020).

As of August 2021 the situation has changed and the UK now holds its own bluefin tuna quota under ICCAT, as a result of it leaving the EU (48 t). Under this quota, allocations have been made to account for incidental mortality arising from the 'catch-and-release tagging' programme (CHART) and for unavoidable bycatch in commercial fisheries including this UoA. There are management measures in place for this stock as of 2021.

- For the protection and conservation of bluefin tuna there is a minimum conservation reference size (MCRS). For bluefin tuna caught in the Eastern Atlantic and Mediterranean the MCRS is 30 kg or 115 cm (fork length).

- Selling bluefin tuna is only allowed under certain provisions. This is to prevent direct targeting. These provisions are:
 - A limit of one by-caught bluefin tuna able to be sold per trip by vessels.
 - Only vessels with gear types with a risk of unavoidable bycatch can sell this bluefin tuna. [this includes ringnets].
- If the bluefin tuna cannot be returned to the sea alive, UK vessels must:
 - record all bluefin tuna bycatch;
 - report and land all dead bluefin tuna above MCRS;
 - discard all dead bluefin tuna that are below MCRS; vessels must record all discards.

Source: <https://www.gov.uk/guidance/bluefin-tuna-in-the-uk>

The CSMA has also in place a tuna ID guide for this species to assist with species recognition (Figure 27).

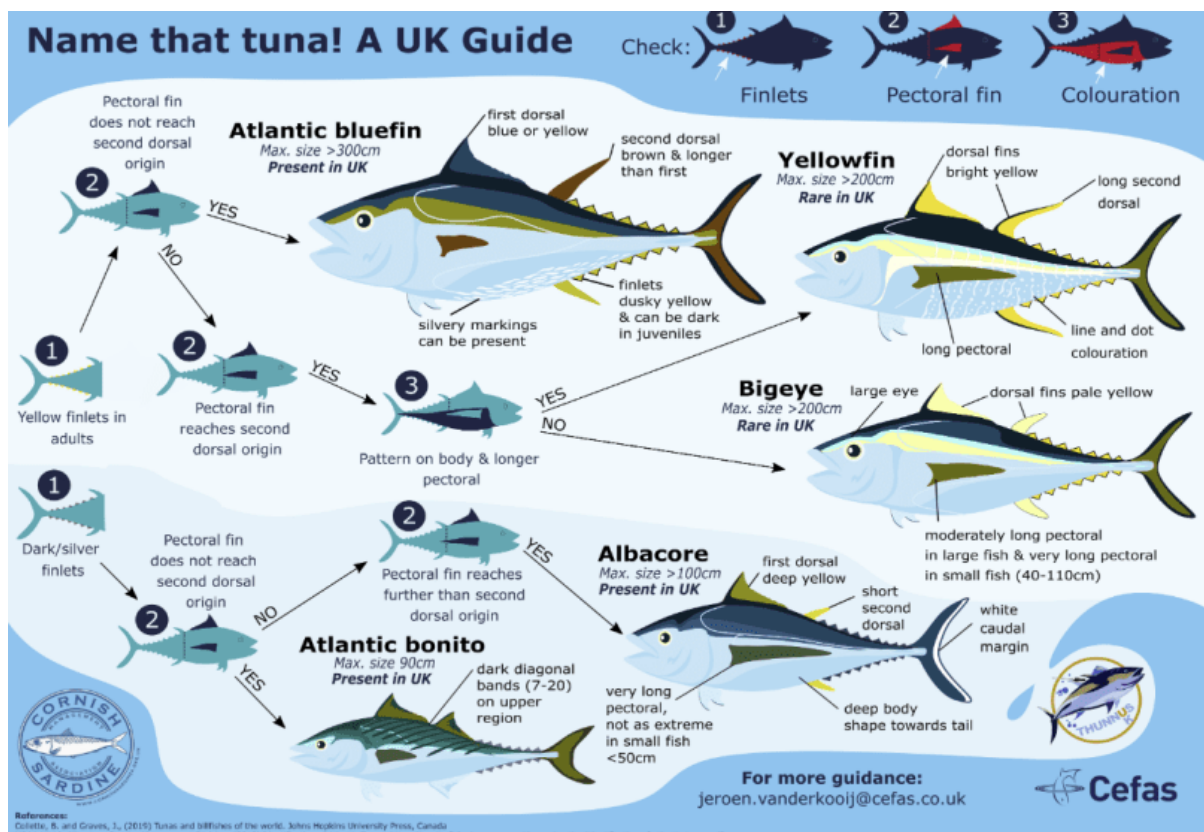


Figure 27. Tuna ID guide by CSMA and Cefas.

6.2.5 ETP species

6.2.5.1 Designations

ETP species are identified against the MSC criteria listed in section 6.2.1 and using the relevant UK legislation concerning the protection of wildlife including: -

a. Annex I & II of the EU Habitats Directive;

b. Schedule 5 of the UK Wildlife & Countryside Act; and

c. Article 57 (“Prohibited species”) of the current EU Regulation (2021/92) setting TACs for this sea area (EC 2021). Prohibited species within subarea 7 include:

- common skate (*Dipturus batis*)
- tope shark (*Galeorhinus galeus*)
- porbeagle (*Lamna nasus*)
- undulate ray (*Raja undulata*)
- whale shark (*Rhincodon typus*)
- picked dogfish (*Squalus acanthias*)
- common skate complex (*Dipturus batis*)

Management of these species is in the form of prompt release after any accidental encounter (EC 2021). None of these elasmobranchs have been recorded within CSMA logsheets or observer data and are therefore not considered in any further detail as ETP species which interact with the fishery.

The UK left the EU as of January 1st 2021 but designations of species and habitats under the EU habitats Directive are still in place e.g. Special Protection Areas etc. therefore the qualifying criteria are still considered by the team to be relevant to this assessment.

EC Habitats Directive (92/43/EC), the Wild Birds Directive (2009/147/EC) and the UK Wildlife Act 1981 (updated 2008) (UK 2008). The species listed in this legislation which are known in the region are:

- Bottlenose dolphins (*Tursiops truncatus*)
- Common dolphin (*Delphinus delphis*)
- Harbour porpoise (*Phocoena phocoena*)
- Harbour seals (*Phoca vitulina*)
- Grey seals (*Halichoerus grypus*)
- Basking shark (*Cetorhinus maximus*)
- Twaite shad (*Alosa fallax*)
- Allis shad (*Alosa alosa*)
- Marine turtles (several species)
- Seabird species (see Table 27)

Table 22. Bird species with potential overlap with the fishery and conservation status, this table is updated from that previously published in Cieri et al. (2017)* comments from previous assessment.

Scientific Name	Common Name	Potential Overlap	Observed by CSMA Fishermen*	Status	Protective Legislation
<i>Larus fuscus</i>	Lesser Black-backed gulls	Present all year	Gulls are most commonly seen birds	Rated as Amber by RSPB	OSPAR Convention The Wildlife and Countryside Act 1981
<i>Larus marinus</i>	Great black backed gull	Present all year		Rated as Amber by RSPB	AEWA The Wildlife and Countryside Act 1981
<i>Larus argentatus</i>	Herring Gull	Present all year		Least concern (EU Red list)	AEWA, Birds Directive The Wildlife and Countryside Act 1981
<i>Fulmarus glacialis</i>	Northern Fulmar	Mainly observed in coastal areas summer	Occasionally seen	Assessed as Endangered (EU Red list)	EU Birds Red-List The Wildlife and Countryside Act 1981
<i>Puffinus mauretanicus</i>	Balearic Shearwater	Feeds on anchovies, sprat & sardines Mainly observed in summer: July – Sept.	Rarely seen	Assessed as Critically Endangered (EU Red list)	OSPAR, EU Birds Red-List The Wildlife and Countryside Act 1981
<i>Rissa tridactyla</i>	Black legged Kittiwake	Mainly observed in coastal areas summer	Never seen	Assessed as Vulnerable (EU Red list)	AEWA The Wildlife and Countryside Act 1981
<i>Uria aalge</i>	Common Guillemot	Mainly observed in summer		Rated as Amber by RSPB	AEWA The Wildlife and Countryside Act 1981
<i>Alca torda</i>	Razorbill	Feed on sprats, herring and sandeels but mainly observed in summer		Rated as Amber by RSPB	AEWA, Birds Directive The Wildlife and Countryside Act 1981
<i>Phalacrocorax carbo</i>	Great cormorant	All year	Seen fishing around coast	Least concern (EU Red list)	Birds Directive The Wildlife and Countryside Act 1981
<i>Morus bassanus</i>	Gannet			Least concern (EU Red list) UK amber-listed bird of conservation concern	Birds Directive The Wildlife and Countryside Act 1981

Table 23. Potential mammals encountered in the Cornish sardine fishery

Scientific Name	Common Name	Spatial Occurrence	Temporal Occurrence	Potential overlap	Estimated Status	Protective legislation
<i>Phocoena phocoena</i>	Harbour Porpoise	Few sightings in the Channel	No seasonal pattern	Potential overlap	35,232 for the Celtic and Irish seas population (NAMMCO 2019)	CITES, CMS, Habitats Directive, OSPAR ASCOBAN
<i>Tursiops truncatus</i>	Common Bottlenose Dolphin	Some sightings in the Channel	Spring	Possible overlap in early spring (e.g. March)	17,500 in the Irish Sea Between 19,295 and 12,645 in the English channel Source: ASCOBAN	CITES, Habitats Directive ASCOBAN
<i>Delphinus delphis</i>	common dolphin	Present in Western Approaches to Channel	-	Potential overlap but prefers deep water	The most recent estimate is 468,000 for the NE Atlantic population (Hammond et al. 2017). 120,00	CITES, CMS, Habitats Directive ASCOBAN

Table 24. Potential pinniped species encountered by the fishery.

Scientific Name	Common name	Spatial Occurrence	Potential overlap	Protective legislation
<i>Halichoerus grypus</i>	Grey seal	Present in small numbers in the SW compared with other areas of the UK. The latest UK population figures estimate that the population is 150,000 (approximate 95% CI 131,000-171,600) grey seals (1+ aged population) in 2017 (SMRU 2018).	Potential overlap	Habitats Directive, CMS
<i>Phoca vitulina</i>	Common seal/Harbour sea	Low numbers compared to other areas of the UK. UK population of 36,050 according to the seal trust	Potential overlap	Habitats Directive, CMS

Of relevance to this fishery as it overlaps with the fishery footprint. Natural England activated (2017) the Falmouth Bay to the St Austell Bay Special Protection Area (SPA), through the SPA selection guidelines based on EC Directive 2009/147/EC on the Conservation of Wild Birds Special Protection Area (NaturalEngland 2017). The site qualifies under Article 4.1 of the Directive (2009/147/EC) as it is used regularly by 1% or more of the Great Britain population of Annex I species great northern diver, black-throated diver and Slavonian grebe in any season (Table 25).

Table 25. Annex 1 species designations for the Falmouth Bay to St Austell Bay Special Protection Area.
Source (NaturalEngland 2017).

Species	Count	% of subspecies or population (pairs)	Interest type (EU legislation)
Black-throated diver <i>Gavia arctica</i>	115 – wintering (2009/10 – 2010/11)	20.5% GB population	Annex 1
Great northern diver <i>Gavia immer</i>	74 individuals – wintering (2009/10 – 2010/11)	3.0% GB population	Annex 1
Slavonian grebe <i>Podiceps auritus</i>	15 individuals – wintering (2007/08 – 2011/12)	1.4% GB population	Annex 1

Analysis of bird interaction with mobile fishing gear during the consultation phase of the SPA designation was undertaken by Natural England and contracted consultants. During nine boat transects, 20 net observations were recorded with four net observations involving a bycatch of birds, none of the species trapped were interest features of the SPA (Cruickshanks & liley 2014). Further work in subsequent years showed only four incidents of great northern diver bycatch. The incidents of great northern diver catch are associated with static fishing gear using small mesh sizes and mono-filament line which is invisible underwater. The potentially significant predictors of bycatch incidence were: distance to coast (netting incidents <260 metres from shore); mesh size (in particular 90 mm – 99 mm and 100 mm - 120 mm nets); water depth (shallow depths <12 metres deep) and degree of enclosure by land (Panter & liley 2016). Management of fishing gear regulation in relation to the SPA is directed under the Cornwall Inshore Fisheries and Conservation Authority (CIFCA) and following the designation they have advised that they do not intend to apply any additional management measures (local bylaws etc) within the SPA to any fishing operations based on the low-level incidences involving SPA species (D. Matthews pers. Comm. 09/01/18).

6.2.5.2 ETP species and the UoA

No incidences of bird mortality nor marine mammal mortality were recorded in logbooks for 2016 – 2017, which were evaluated at the last assessment (Cieri et al. 2017). However, at the time, there were issues surrounding incomplete logbooks, concern from stakeholders and a condition was issued to the fishery in this regard (Cieri et al. 2017). Improved logbook formats and introduction of the observer program in 2018 saw better information be available for the fishery from 2017 onwards and ETP interactions have been reported in the surveillance audits for the fishery since (Jones et al. 2018; Jones et al. 2019; Jones et al. 2020). These are summarised in Table 26. The new catch app under trial also shows the ability to record ETP interactions (section 4.2.5.1).

CSMA members noted in previous audits, and confirmed previously in observer reports (Catchpole et al. 2015), that seabirds surround the net (Figure 28) and occasionally do enter the net in order to scavenge, but that banging on the side of the boat with a steel bar (or other scare means) disperses the birds. The fishers note that on occasion a bird may be submersed on hauling and require assistance. On these occasions they can be scooped aboard using a net and set on a foredeck to dry out. This method was independently observed in 2018 (SMRU 2018) and by the assessment team at the site visit.



Figure 28. Gulls - herring gulls (*Larus argentatus*), lesser Black-backed gulls (*Larus fuscus*) and great black backed gull (*Larus marinus*) present during a hauling event. Source: CU UK

As noted in previous audits and in section 6.2.2.4 of this report observer data from 2018 and 2019 only report interaction with herring gulls (*Larus argentatus*), although sightings of common dolphin (*Delphinus delphis*) near the vessels are reported there is no direct interaction (SMRU 2018) (SMRU 2019).

Table 26. ETP interactions with the UoA since 2017 with fate and comments. Source: CSMA logbooks.

Species	2017	2018	2019	2020	total
Black back gull <i>(Larus marinus)</i>	0	0	0	2 (released alive)	2
Herring gulls <i>(Larus argentatus)</i>	0	53 28 dead (single event) all others alive.	0	0	53
Gull (unspecified)	0	0	0	11 (released alive)	11
Bird unknown				4 (released alive)	4
Common dolphin <i>(Delphinus delphis)</i>	1 (fate unknown)	7 6 alive, 1 unknown fate	5 (released alive) 19 observed near vessels	2 (released alive)	15
Harbour porpoise <i>(Phocoena phocoena)</i>	0	0		3 (released alive)	3
Seal <i>(Halichoerus grypus)</i>	0	0	2 (released alive)	2 (released alive)	4

6.2.5.3 ETP Management

As of 2021 the UK has implemented a new licence condition for the reporting of marine mammal bycatch to comply with international standards for the conservation of marine mammals ([MMO link](#)). Under this condition there is now a mandatory requirement, whereby fishers need to report any bycatch of marine mammals to the MMO, via a template in the link above, within 48 hours of the end of the fishing trip. As this regulation has only just been implemented assessment against this new requirement can only be accounted for in future audits of the fishery.

All species of wild birds are protected by the EU Birds Directive and unlawful capture or killing, destruction of nests, taking of eggs and disturbance of birds is prohibited. The EU Habitats Directive requires strict protection of a number of marine species of European importance in Annex II and IV. All cetaceans are afforded similar protection under the ASCOBANS convention. Within England, The Wildlife and Countryside Act provides equivalent protection under domestic legislation for some other marine species such as basking shark. These species are protected wherever they are found and not only in protected areas. The species protected under the Act are subject to review every five years.

All cetaceans are classified as European protected species and are protected from deliberate disturbance, taking, injury or killing by the Conservation of Habitats and Species Regulations 2017 (HM 2017), and the Wildlife and Countryside Act 1981 (UK 2008).

It is also an offence under the legislation mentioned above to take, possess, transport or sell any parts or derivatives of marine European protected species without a wildlife licence (disposal of the carcass arranged by the local authority or landowner does not require a wildlife licence). If a cetacean is accidentally caught by a fishing vessel, it should be released as soon as possible and without harm. If a

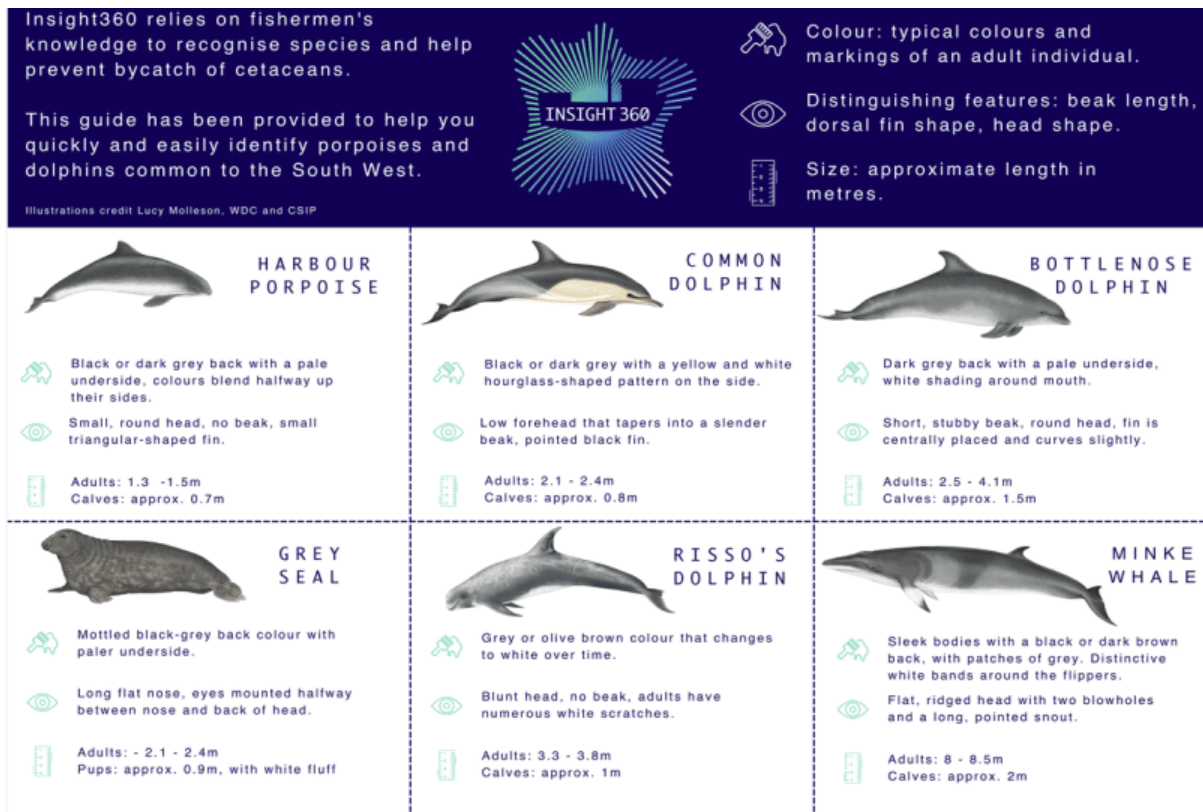
cetacean has been accidentally caught and has been discovered dead in the net it must be reported to the Receiver of Wreck³ before it can be disposed of.

For elasmobranch and ‘fish under prohibition to take’, management of these species is in the form of prompt release after any accidental encounter (EC 2021; UK 2020).

At the UoA level, the CSMA requires members to sign a code of conduct each year (CSMA 2019b) which requires its members to:

- ... abide by the CSMA slippage policy when prosecuting the fishery to minimise unwanted catches of pelagic species
- ... thoroughly and accurately complete their CSMA logbooks in a timely manner and submit them for collation annually, before the AGM. Cetacean and seabird interactions will be recorded in logbooks whenever applicable.

The CSMA has also issued skippers with a cetacean/seal identification guide which covers the species which are likely to interact (and others) with the fishery to aid in correct identification is assigned (Figure 29).



Insight360 relies on fishermen's knowledge to recognise species and help prevent bycatch of cetaceans.

This guide has been provided to help you quickly and easily identify porpoises and dolphins common to the South West.

Illustrations credit Lucy Mollison, WDC and CSIP

INSIGHT 360

- Colour: typical colours and markings of an adult individual.
- Distinguishing features: beak length, dorsal fin shape, head shape.
- Size: approximate length in metres.

Species	Coloration	Head/Beak	Dorsal Fin	Size (Adults)	Size (Calves)
HARBOUR PORPOISE	Black or dark grey back with a pale underside, colours blend halfway up their sides.	Small, round head, no beak, small triangular-shaped fin.	Small, triangular	1.3 - 1.5m	approx. 0.7m
COMMON DOLPHIN	Black or dark grey with a yellow and white hourglass-shaped pattern on the side.	Low forehead that tapers into a slender beak, pointed black fin.	Pointed	2.1 - 2.4m	approx. 0.8m
BOTTLENOSE DOLPHIN	Dark grey back with a pale underside, white shading around mouth.	Short, stubby beak, round head, fin is centrally placed and curves slightly.	Short, curved	2.5 - 4.1m	approx. 1.5m
GREY SEAL	Mottled black-grey back colour with paler underside.	Long flat nose, eyes mounted halfway between nose and back of head.	None	2.1 - 2.4m	Pups: approx. 0.9m, with white fluff
RISSE'S DOLPHIN	Grey or olive brown colour that changes to white over time.	Blunt head, no beak, adults have numerous white scratches.	None	3.3 - 3.8m	Calves: approx. 1m
MINKE WHALE	Sleek bodies with a black or dark brown back, with patches of grey. Distinctive white bands around the flippers.	Flat, ridged head with two blowholes and a long, pointed snout.	None	8 - 8.5m	Calves: approx. 2m

Figure 29. Cetacean ID guide. Source: CSMA

In 2019, a CSMA member vessel was recorded on camera from the shore by members of the public interacting with three dolphins. As described in Jones et al. (2020), these animals were released alive and reported by the skipper. Following the incident, the CSMA sought input from the SMRU and included within the slippage policy document a link describing the ‘backdown procedure’ used by the skipper in the 2019 incident <https://www.bmis-bycatch.org/mitigation-techniques/backdown->

³ <https://www.gov.uk/guidance/wreck-and-salvage-law>

[procedure-and-medina-panel](#) (CSMA 2020b). In addition to the slippage link, vessel skippers and owners have fitted CCTV cameras to all vessels for the start of the 2020 – 21 season and this system is reviewed in section 6.2.2.5 of this report.

6.2.6 Habitats

The MSC FCR v2.01 requires habitats interacting with the fishery to be defined as ‘commonly-encountered’, ‘VME’ or ‘minor’, with definitions as given in Table 27.

Table 27. Habitat definitions as per the MSC Fisheries Certification Requirements v2.01.

FCR reference	Definition
SA3.13.3.1	A commonly encountered habitat shall be defined as a habitat that regularly comes into contact with a gear used by the UoA, considering the spatial (geographical) overlap of fishing effort with the habitat’s range within the management area(s) covered by the governance body(s) relevant to the UoA.
SA3.13.3.2	A Vulnerable Marine Ecosystem (VME) shall be defined as is done in paragraph 42 subparagraphs (i)-(v) of the FAO Guidelines (definition provided in GSA3.13.3.2). This definition shall be applied both inside and outside EEZs and irrespective of depth.
GSA3.13.3.2	VMEs have one or more of the following characteristic, as defined in paragraph 42 of the FAO Guidelines: Uniqueness or rarity – an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by similar areas or ecosystems Functional significance of the habitat – discrete areas or habitats that are necessary for survival, function, spawning/ reproduction, or recovery of fish stocks; for particular life-history stages (e.g., nursery grounds, rearing areas); or for ETP species Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities Life-history traits of component species that make recovery difficult – ecosystems that are characterised by populations or assemblages of species that are slow growing, are slow maturing, have low or unpredictable recruitment, and/or are long lived Structural complexity – an ecosystem that is characterised by complex physical structures created by significant concentrations of biotic and abiotic features
N/A	Minor habitats are those that do not meet the above definitions.

6.2.6.1 VME

There are several important considerations regarding the MSC’s VME habitat requirement that were clarified through the MSC Interpretations website (<https://mscportal.force.com/interpret/s/global-search/VME>):

- It is not the responsibility of an assessment team to identify habitats as VME within the fished area. Instead, VMEs need to be identified by a local, regional, national, or international management authority/governance body.
- The history of fishing and when the VME was identified is critical to establishing what the ‘unimpacted level’ is; if a VME was already impacted by any fishery/UoA prior to its identification as a VME, and fishing impacts occurred prior to 2006, then the ‘unimpacted level’ is considered to be the status at the point of designation⁴.

⁴ Note: The year 2006 was chosen because it is the date of the UNGA Resolution 61/105

6.2.6.2 Fishery impact on habitats

Although ring nets should not cause damage to the seabed as they function in midwater, this is only the case if the water is deeper than the depth of the net when being pursed. The maximum height of a net is 60 m but due to the nature and deployment of the net, this vertical height is not a true reflection of the depth to which the net could interact with the seabed. As the net is deployed it does not hang vertically in the water but it billows out reducing the functional operating depth to approximately ½ the net height e.g. a maximum of ~30 m. One of the CSMA skippers of the fleet had this to note on depth of interaction:

'It [what depth could the net actually touch the bottom] all depends on the hanging ratio to the headroom and foot rope the amount of weight in the foot rope, the depth of the panels and the way the panels are set, along the rows or across the rows, bear in mind every boat has different set nets from different suppliers, and we set our own. All I can say is our net hanging straight as a wall would be 60 m [the CAB note this is one of the largest vessels in the fleet] but at no time would it fish like that even during slowly pursing. We were fishing in 30 m last night over rough ground only just touching the bottom in one place, evidenced [by] a 1 metre rip, as the pursing operation prevents it going deeper if you want it to. The answer is there is not one single calculation you could apply to all nets.' (Stefan Glinski pers. comm.)

As evidenced in Figure 3, fishing activity is directed up to 60 m of depth with the principal area of effort at 17 m. Theoretically based on net height, the functional operating depth of the net and the skipper's opinion about habitat interaction is limited to 30 m depth and therefore the assessment team consider habitats below this depth to not directly interact with the fishery. This depth was confirmed in conversation with CIFCA (Appendix 4) and all industry attendees at the site visit noting that the depth at which the net may interact is very much vessel, skipper and net dependent.

Where interaction does occur, it is in the form of physical disturbance from the purse line (and the bottom of the net) scrapping the seabed as it is pursed. There is no sediment penetration with this type of net but there the possibility of scrapping and dislodgement of epibenthic fauna and the risk of entanglement with rocks/boulder. Therefore, the fishery only targets sardine when they are above suitable substrata where entanglement risk is low. There is active avoidance of any hard substratum (rough ground) by the fleets as net entanglement with rocks, boulders and other non-flat benthic substrates can endanger the vessel and cause net damage (see quote above). Evidence of this process is clear in the logbooks of the fleet with comments such as *'didn't shoot sardine on hard ground'*, *'only marks [shoals of sardine] on rocky ground found'*. In 2020/2021, across all vessels there were 6 reported incidences of ripped nets associated with bottom contact. In 2019, an incident where a vessel found itself too close to shore in poor weather with a stuck net had to abandon its net and slip its catch (Jones et al. 2019). The net was later recovered.

6.2.6.3 Fishery footprint

The fishery footprint is known from logbook records and has been published in reports (Rodríguez-Climent et al. 2021; Stanton 2021) (Figure 33 and Figure 32). It was also confirmed at site visit from vessel plotters (Figure 30, Figure 31). Catch hotspots continue to be around Mounts Bay with almost all effort taking place in water <60 m with a target fish depth on average of 17 m (Stanton 2021). The same trend was present in 2020 (Rodríguez-Climent et al. 2021) where despite some exploration to the north coast of Cornwall by CSMA fleets, as reported in previous audits, there appears to be unusual locations, north of the Cornwall peninsula which the authors conceded may be the result of

transcription errors in the longitude axis. This appears to be confirmed by the available VMS data shown in Figure 10 which covers the majority of the larger vessels in the fleet.

Based on the fishery footprint and depth information the habitat area under consideration in this assessment is the Southwestern coastal line of the UK from low water to 30 m depth within the Western Approaches of the English Channel. Bathymetry data for this area is shown in Figure 34 and Figure 35. Some habitats under consideration here extend across NW Europe but the team felt this scale of habitat area would not be appropriate for the fishery given its localized footprint.

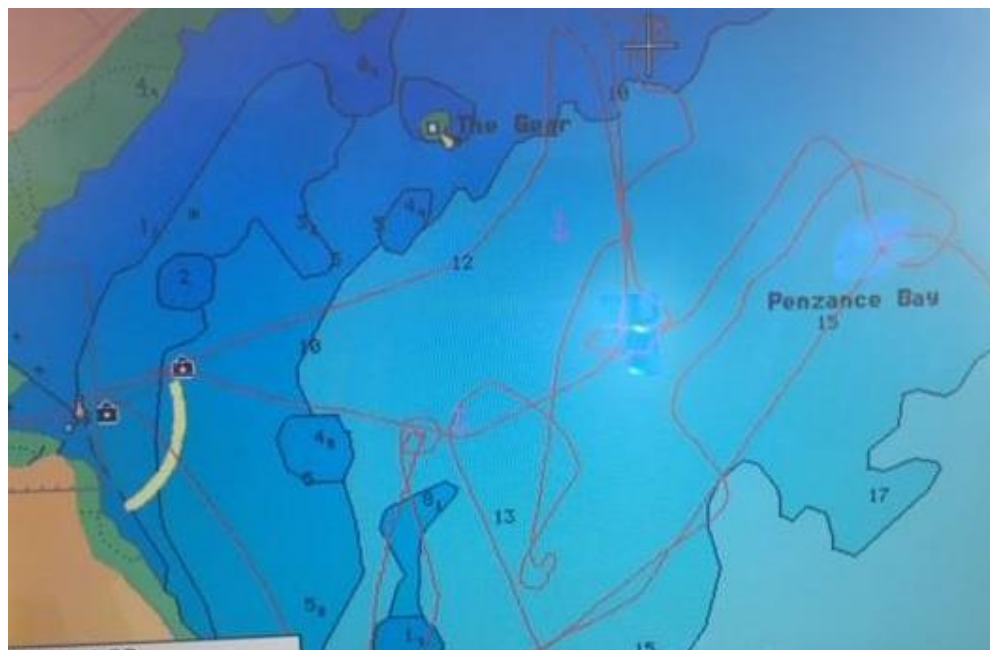


Figure 30. Image of CSMA vessel plotter showing recent fishing events (tight circles in red) within Mounts Bay, depth in fathom (1 fathom = 1.8 m). Source: CU UK.



Figure 31. Image of CSMA vessel plotter showing fishing events within Mounts Bay over the past few years, depth in fathom (1 fathom = 1.8 m). Source: CU UK.

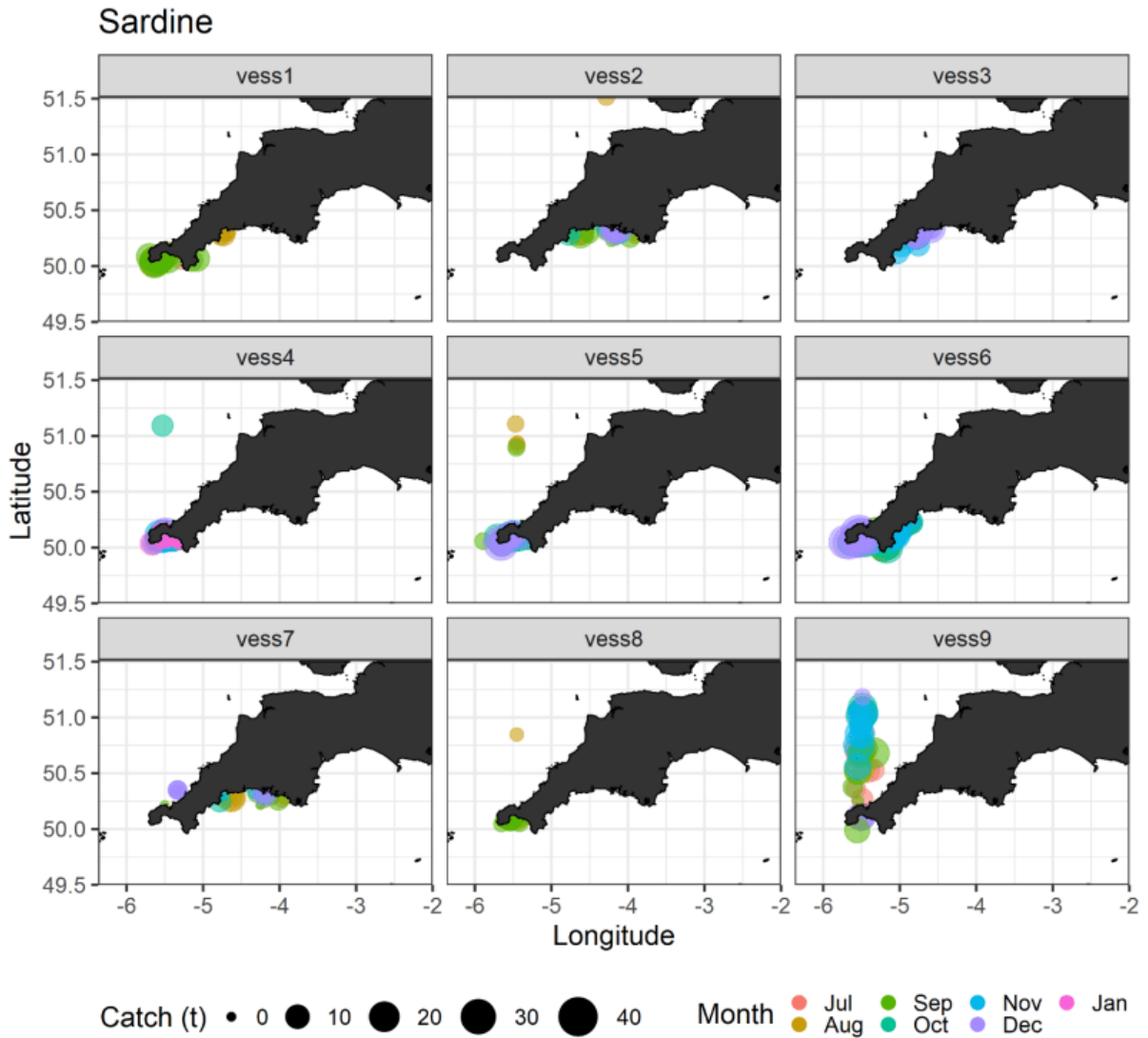


Figure 32. Sardine catches by anonymized FV, location, and month for 2020. Bubble size proportional to catch. Note Unusual locations, north of the Cornwall peninsula were found for vessels 2, 4, 5, 8 and 9; these may be the result of transcription errors [in longitude] according to the source. (Rodríguez-Climent et al. 2021). NOTE: according to CSMA and CEFAS the issue lies in the transcription of longitude between paper logbooks and CEFAS analysis. The error if corrected by longitude will place all activity in Mounts Bay.

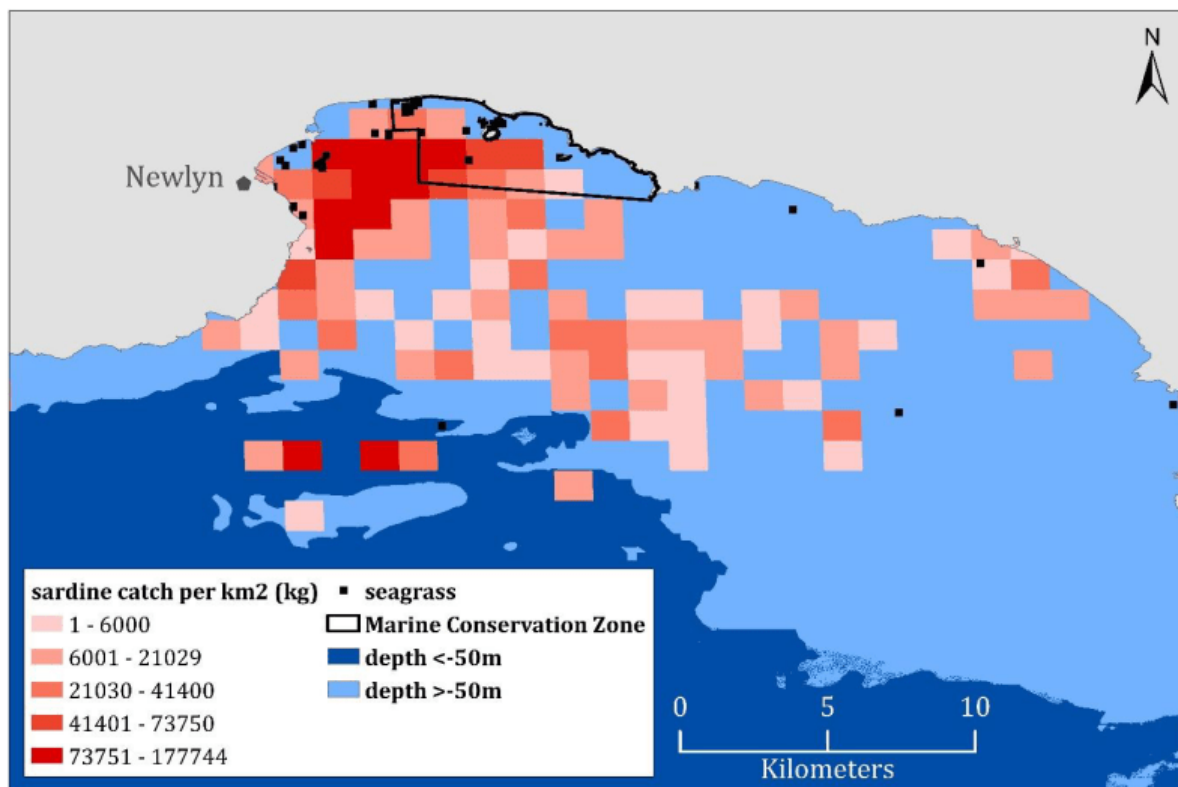


Figure 33. Mounts Bay, Cornwall, UK and CMSA catches in 2019 by unit area. The figure also shows depth contour, seagrass areas and the Marine Conservation Zone (MCZ). Source (Stanton 2021).

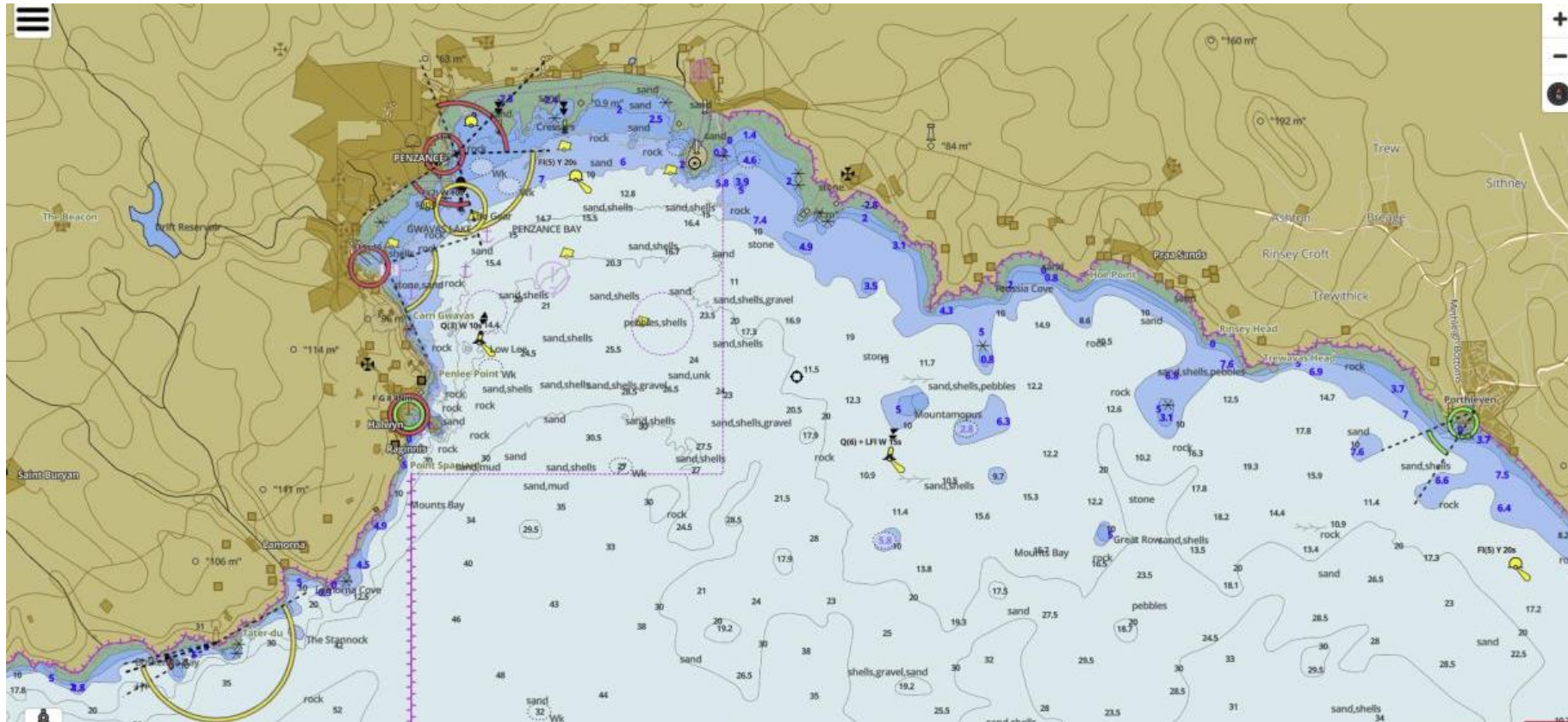


Figure 34. Bathymetry data for Mounts Bay Cornwall the principal fishing ground for the UoA. Blue contour line is 10 m, 20 m and 30 m contours are shown. Source: <http://fishing-app.gpsnauticalcharts.com/i-boating-fishing-web-app/fishing-marine-charts-navigation.html?title=Penzance+Bay+boating+app#12/50.0877/-5.4570>

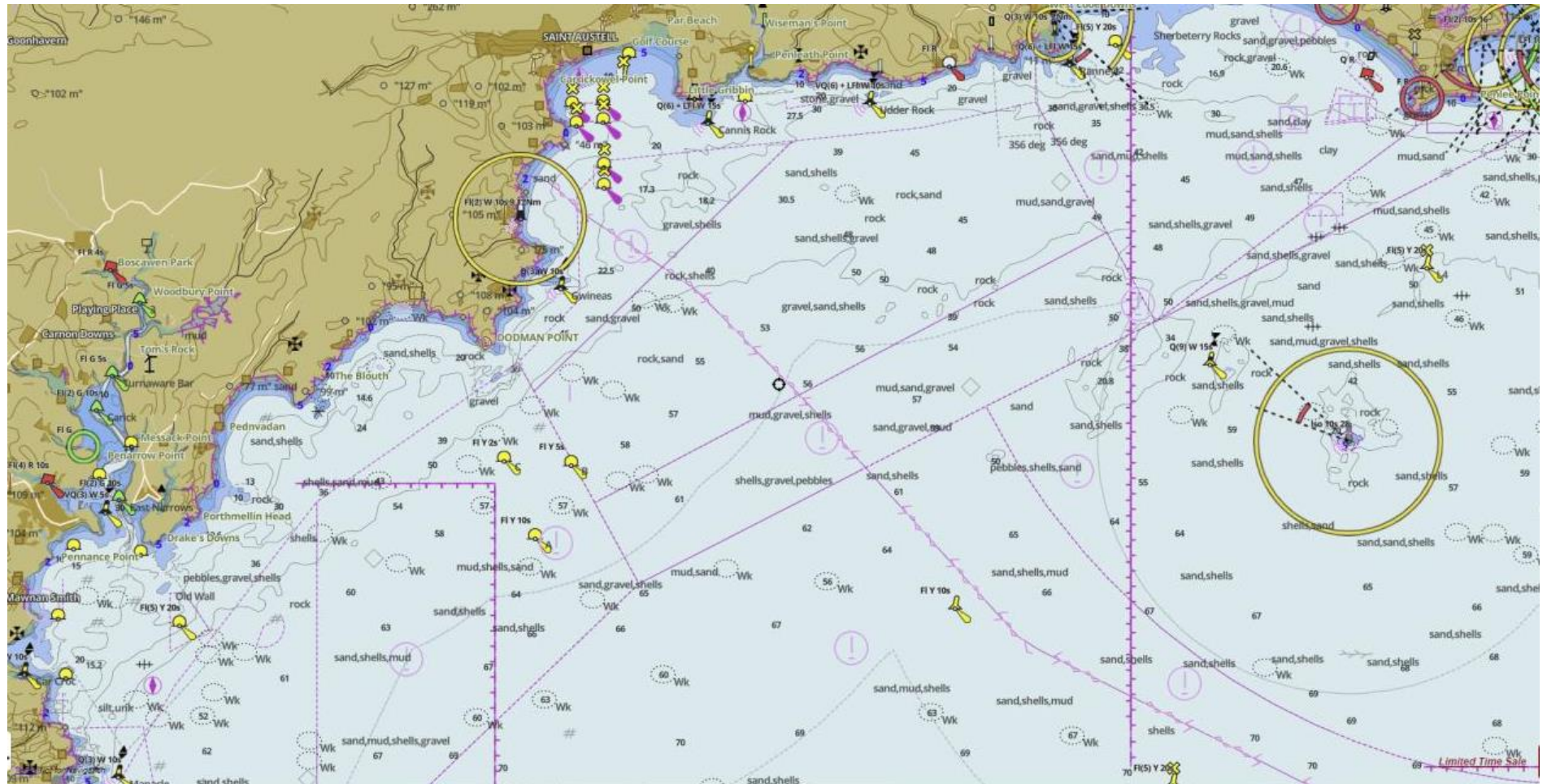


Figure 35. Bathymetry data for east Cornwall to Plymouth Sound the eastern fishing ground for the UoA. Blue contour line is 10 m, 20 m and 30 m contours are shown. Source: <http://fishing-app.gpsnauticalcharts.com/i-boating-fishing-web-app/fishing-marine-charts-navigation.html?title=Penzance+Bay+boating+app#12/50.0877/-5.4570>

6.2.6.4 Habitat types within the area of consideration

The habitat under consideration in this assessment is Southwestern coastal line of the UK from low water to 30 m depth within the Western Approaches of the English Channel. The MSC defines ‘habitat’ as ‘the chemical and bio-physical environment, including biogenic structures, where fishing takes place’ (Table GSA2, MSC FCRv2.01). For assessment purposes, the MSC requires that benthic habitats are described according to the following criteria (SA3.13.2 and Table GSA6, MSC FCR v2.01):

- characterising substratum - i.e. fine (mud, sand), medium, large or solid reef of biogenic origin;
- geomorphology - i.e. flat, low relief, outcrop or high relief; and
- biota (i.e., large erect, small erect/encrusting/burrowing, no fauna or flora, or flora)

Broadscale habitat types are available from The EMODnet Seabed Habitats website (Figure 36 and Figure 37) at a level of resolution to define the key habitats within the area of consideration. These are circalittoral fine sand or circalittoral muddy sand, circalittoral coarse sediment (commonly encountered habitats elements), high energy circalittoral rock, orange and high energy infralittoral rock. These rocky habitats are principally minor habitats, but some areas and biotopes are designated VME habitats (see section 6.2.6.5). These habitat types can be further defined using UK biotope classification and biotope maps produced via the MarLIN (www.marlin.ac.uk) open resource biotope classification system. Biotopes are subcategories of the principal habitat types, and the MarLIN website provides detailed sensitivity analysis of biotopes grouped by type which consist of resistance, and sensitivity ratings based on pressure types. For each scoring element (habitat type) the following tables summarise the habitats main features, describe its risk to abrasion (direct contact with the UoA net) and show the MarLIN sensitivity analysis. A university thesis published in 2021 recorded the possible impact of the CSMA fleet on seagrass and concluded that the CSMA fleet does sometimes occur over seagrass beds and in shallow water, with potential for damage by footropes. This habitat is a VME under the OSPAR List of threatened and/or declining species and habitats (OSPAR agreement 2008-6). The MarLIN sensitivity analysis for seagrass in the UK is shown in Table 30 and the thesis is summarised under section 6.2.6.5.

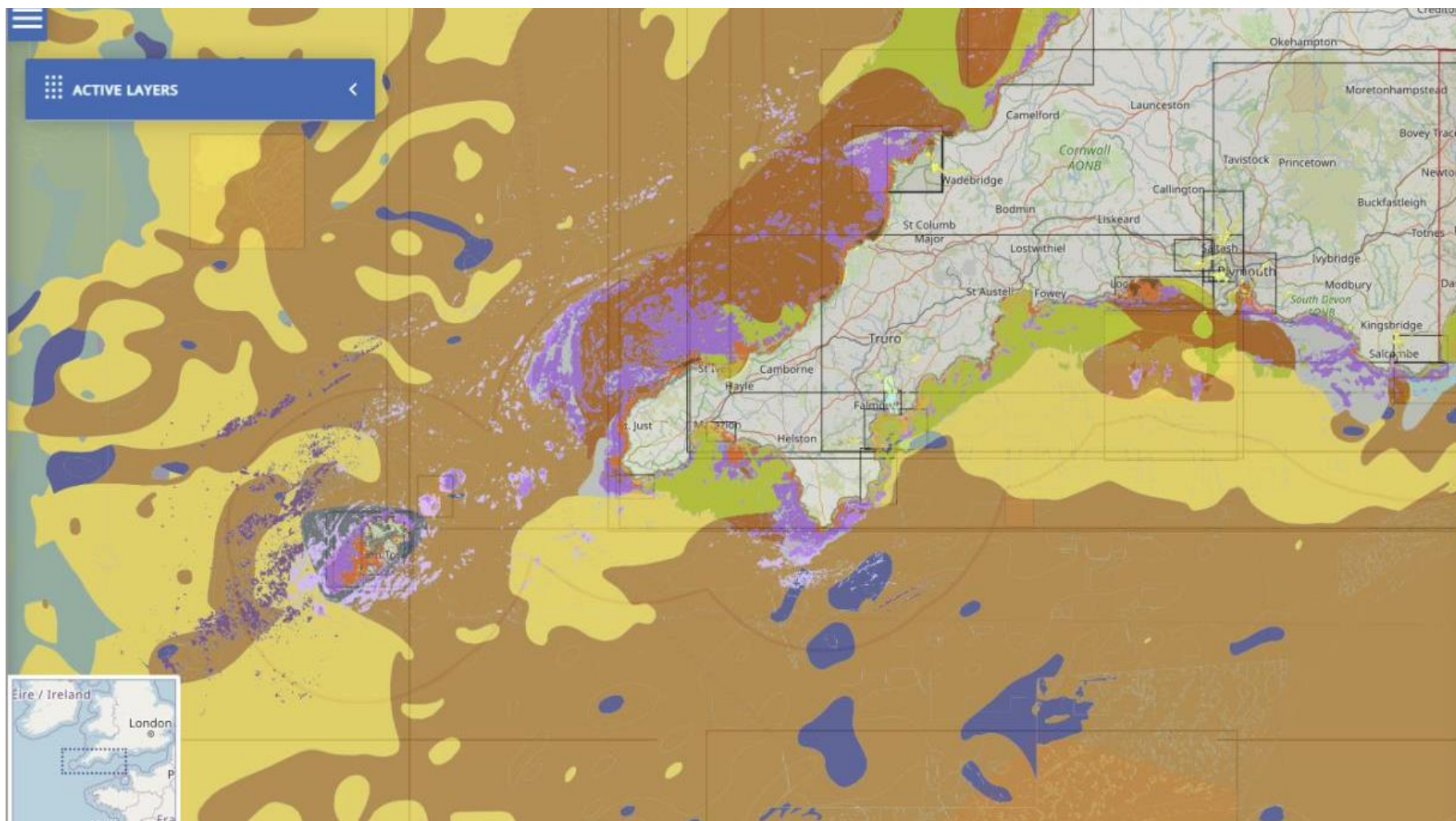


Figure 36. Broad scale habitat types within the Mount Bay region and East to Plymouth, Devon UK the Eastern extent of the where the UoA operates. Green = circalittoral fine sand or Circalittoral muddy sand, Brown = Circalittoral coarse sediment, Purple = high energy circalittoral rock, orange = high energy infralittoral rock
 Source: <https://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/?zoom=5¢er=-5.749,56.543&layerIds=500,501,502&baselayerId=-3>

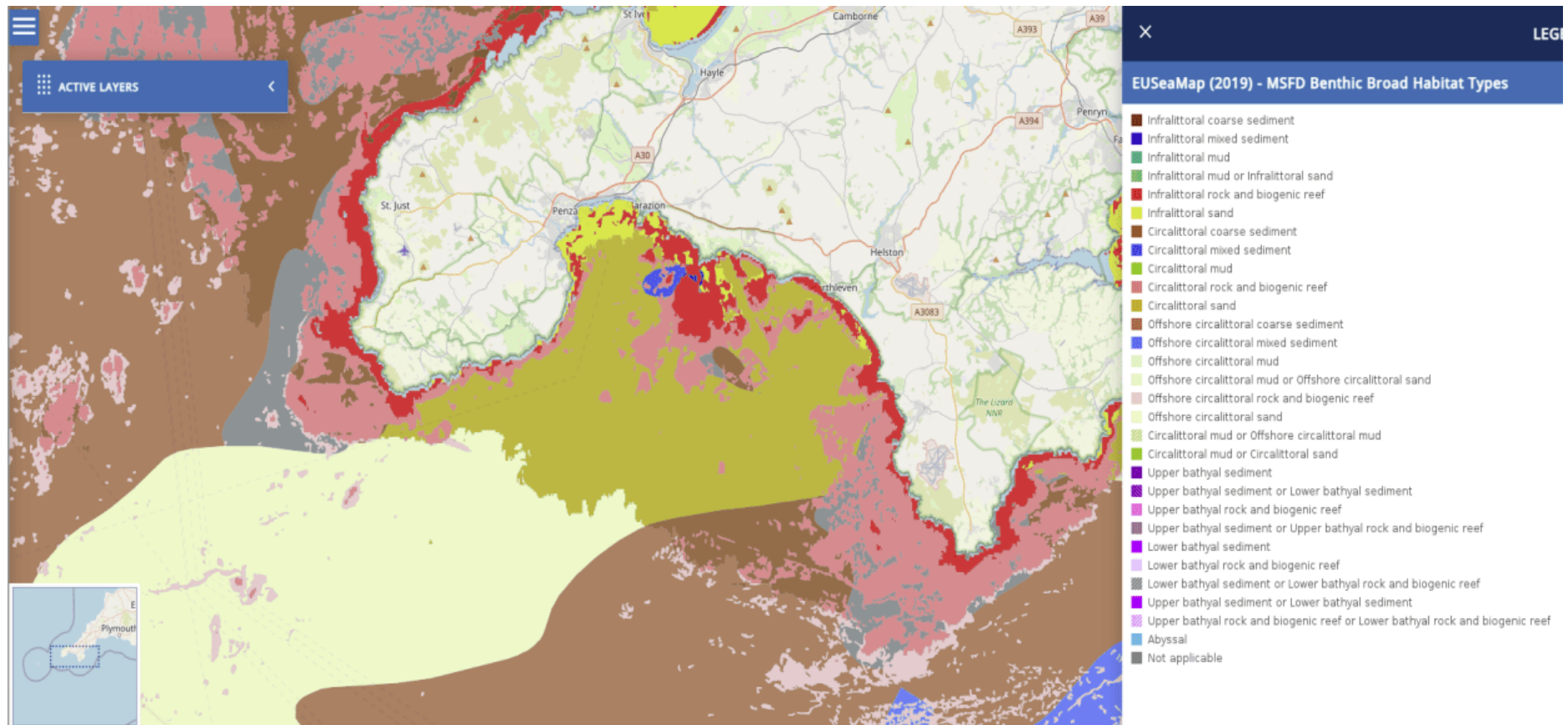


Figure 37. Fine scale habitat types within the Mount Bay region the dominant area of the fishery. Source: <https://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/?zoom=11¢er=-5.341,50.047&layerIds=3&baseLayerId=-3&activeFilters=>

Table 28. Scoring element - Circalittoral fine sand or circalittoral muddy sand subdivided by biotope. Source: https://www.marlin.ac.uk/habitats/habitat/48/subtidal_sands_and_muddy_sands and references within.

Biotope	Description	Sensitivity / fishery impact (Abrasion/disturbance of the surface of the substratum or seabed)	Recovery from impacts
Echinocardium cordatum and Ensis spp. in lower shore and shallow sublittoral slightly muddy fine sand	Very little structural complexity with most species living in or on the sediment. Macroalgae are largely absent although in some areas sparse cover of seagrass may increase habitat heterogeneity because of the leaves and root rhizomes. Depth range to 30 m.	The two key species in the biotope, <i>Echinocardium cordatum</i> and <i>Ensis ensis</i> are infaunal found close to the sediment surface. This life habit provides some protection from abrasion at the surface only. These species are less resilient when the sediment is penetrated. The infaunal position provides some protection but the characterizing species of the biotope may suffer some damage as a result of surface abrasion. Resistance is therefore assessed as Low and resilience as Medium so the biotope's sensitivity is assessed as Medium.	Both key species are relatively long-lived and take several years to reach maturity the time for the overall community to reach maturity is also likely to be several years. Estimated at 5 for recovery from severe disturbance.
Abulina fabula and Magelona mirabilis with venerid bivalves and amphipods in infralittoral compacted fine muddy sand	In stable, fine, compacted sands and slightly muddy sands in the infralittoral and littoral fringe, communities occur that are dominated by venerid bivalves. Depth range to 30 m.	Abrasion is likely to damage epifauna and flora and may damage a proportion of the characterizing species, biotope resistance is therefore assessed as 'Medium'. Resilience is assessed as 'High' as opportunistic species are likely to recruit rapidly and some damaged characterizing species may recover or recolonize. Biotope sensitivity is assessed as 'Low'.	The climax species are relatively quick to mature and it is likely that the community would reach maturity within 2-3 years.
Infralittoral mobile clean sand with sparse fauna	Medium to fine sandy sediment in shallow water, often formed into dunes, on exposed or tide-swept coasts often contains very little infauna due to the mobility of the substratum. Depth range to 20 m.	The species inhabiting this biotope are characteristic of mobile sediments and are adapted to the high levels of disturbance. Resistance to a single abrasion event is assessed as 'Low'. Resilience is assessed as 'High', based on migration from adjacent populations and in-situ reproduction by surviving amphipods. Sensitivity is therefore assessed as 'Low'.	Even following severe disturbances recovery would be expected to occur within a year.
Arenicola marina in infralittoral fine	In shallow fine sand or non-cohesive muddy sand in fully marine conditions (or occasionally in variable salinity) a community	Overall, the recovery of <i>Arenicola marina</i> is probably rapid. However, should a population be severely reduced it may take some time for recolonization to occur from other populations. Therefore, where resistance is 'Medium' or 'Low' (some or	<i>Arenicola marina</i> lives in sediment to a depth of 20-40 cm and, therefore, is protected from most sources of abrasion and physical disturbance caused by surface action. <i>Arenicola</i> is little

Biotope	Description	Sensitivity / fishery impact (Abrasion/disturbance of the surface of the substratum or seabed)	Recovery from impacts
sand or muddy sand	characterized by the polychaete <i>Arenicola marina</i> may occur. This biotope appears quite faunally sparse. Depth range to 20 m	significant mortality) a resilience of High is recorded but where resistance is lower ('None'; severe mortality) a resilience of Medium (2-10 years) is recorded.	affected by abrasion in the form of trampling or vehicle compaction. Therefore, a resistance of High is suggested so that resilience is also High (by default) and the biotope is probably Not sensitive to abrasion

Table 29. Scoring elements high energy circalittoral rock, orange and high energy infralittoral rock - subdivided by biotope - . Source: <https://www.marlin.ac.uk/habitats> and references within.

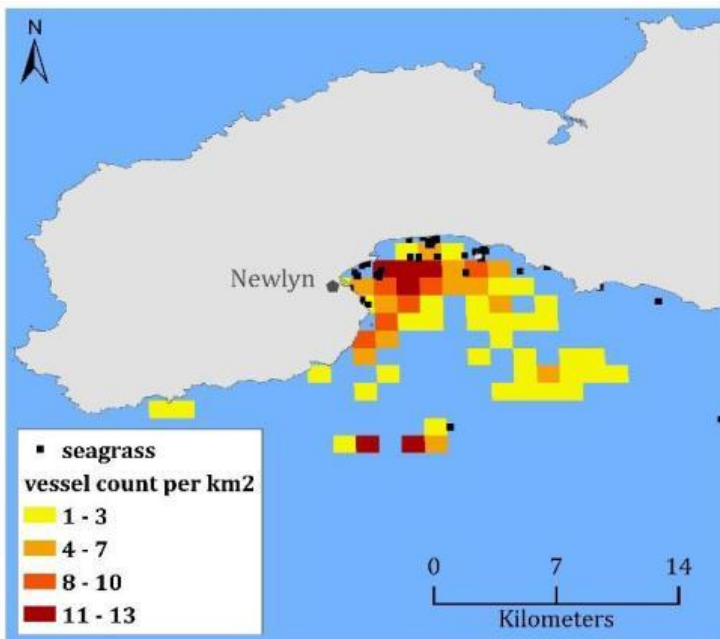
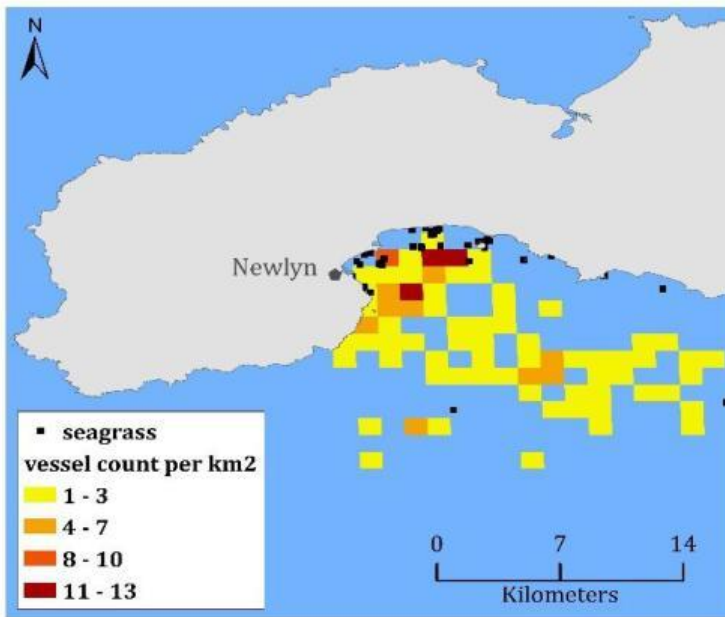
Biotope Group	Description	Sensitivity / fishery impact (Abrasion/disturbance of the surface of the substratum or seabed)	Recovery from impacts
Kelp dominated rock (7 biotopes with similar composition and sensitivity).	Dominated by the kelps <i>Laminaria hyperborea</i> and <i>L. digitata</i> with a dense turf of foliose red seaweeds The faunal component is composed of urchins <i>Echinus esculentus</i> and <i>Paracentrotus lividus</i> and some mussel beds and lobsters. Depth range to 30 m	Resistance to the pressure is considered 'Low', and resilience 'Medium'. The sensitivity of this biotope to damage to seabed surface features is assessed as 'Medium'. Norwegian studies of trawling in these biotopes showed that trawling removed all large canopy-forming adult <i>Laminaria hyperborea</i> , however, sub-canopy recruits were largely unaffected. In 2-6 years of harvesting, a new canopy had formed 1m off the seabed. The associated holdfast communities recovered in 6 years,	The evidence suggests that beds of mature <i>Laminaria hyperborea</i> can regenerate from disturbance within a period of 1-6 years, and the associated community within 7-10 years.
Infralittoral rock and biogenic reefs (3 biotopes with similar composition and sensitivity).	Bedrock and boulders, often in tide-swept areas, that are subject to scouring, or periodic burial, by sand characterized by a canopy of mixed kelps (including <i>Saccharina latissima</i> , <i>Laminaria hyperborea</i> and <i>Saccorhiza polyschides</i>) and <i>Desmarestia spp</i> ; there may also be an under-storey of foliose seaweeds that can withstand scour or burial Depth range to 30 m	Abrasion of the substratum e.g. from bottom or pot fishing gear, cable laying etc. may cause localised mobility of the substrata and mortality of the resident community. The effect would be situation dependent however if bottom fishing gear were towed over a site it may mobilise a high proportion of the rock substrata and cause high mortality in the resident community. However, the characteristic species within the biotope have rapid growth rates and are distinctive of "disturbed areas". Resistance has been assessed as 'None', Resilience as 'High'. Sensitivity has been assessed as 'Medium'.	Both <i>Desmarestia spp.</i> and <i>Saccorhiza polyschides</i> are capable of reaching maturity within a year. <i>Saccharina latissima</i> has been shown to be an early colonizer within macroalgal succession, appearing within 2 weeks of clearance. Therefore, resilience has been assessed as 'High'.

Table 30. Scoring elements seagrass beds - Source: <https://www.marlin.ac.uk/habitats> and references within.

Biotope Group	Description	Sensitivity / fishery impact (Abrasion/disturbance of the surface of the substratum or seabed)	Recovery from impacts
Zostera (Zostera) marina beds on lower shore or infralittoral clean or muddy sand	Expanses of clean or muddy fine sand and sandy mud in shallow water and on the lower shore (typically to about 5 m depth) can have dense stands of <i>Zostera marina/angustifolia</i>	Studies suggest little resistance to abrasion resulting in an assessment of 'Low' resistance. Physical disturbance and removal of plants can lead to increased patchiness and destabilisation of the seagrass bed, which in turn can lead to reduced sedimentation within the seagrass bed, increased erosion, and loss of larger areas of plants. Recovery will, however, be fairly rapid and resilience is assessed as 'Medium'. Therefore, sensitivity is assessed as 'Medium' to this pressure.	Recovery from long-term, large-scale impacts may take several decades, especially where the loss of the seagrass beds result in changes in the habitat, loss of the seed bank or isolation slows recruitment. Therefore, where resistance is assessed as 'Medium' or 'Low', resilience is probably 'Medium' and where resistance is 'None', resilience is probably 'Very low', depending on the effects of the pressure on the habitat. Recovery from abrasion events found [experimentally] that recovery began within a month after a disturbance in the lower intertidal continuous perennial beds and was complete after two years, whereas, outside of the main beds took almost twice as long to recover [4 years].

6.2.6.5 Seagrass habitat study – VME

A university thesis published in 2021 recorded the possible impact of the CSMA fleet on seagrass and concluded that the CSMA fleet does sometimes occur over seagrass beds and in shallow water, with potential for damage by footropes. However, the authors found that the majority of fishing occurs away from seagrass locations, and only 1.21% of fishing locations were found within 100 m of seagrass and were consequently close enough to cause damage (Stanton 2021). The study concluded that definitive overlap between the fleet and the habitat cannot be established for all seagrass location as the data set for seagrass was limited spatially. The author recommended that consideration should be taken when using ring nets in relatively shallow water and specifically when fishing near seagrass (Stanton 2021).



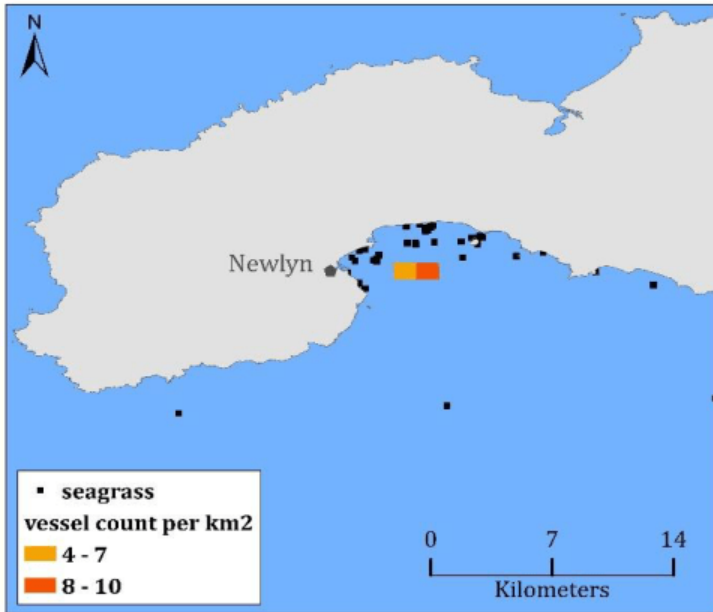


Figure 38. Spatial changes in fishing effort across the sardine fishing season in Mounts Bay, Cornwall, with overlaid seagrass data 2019. A: July-September. B: October- December. C: January-March. Source: Stanton (2021).

Since that thesis was published CIFCA have undertaken significant steps to map the location of seagrass throughout the district with acoustics with respect to seagrass being a feature in a number of protected areas (see sections below). This work is ongoing and includes reports on the extend of seagrass in Plymouth Sound (Jenkin et al. 2021), Whitsands Bay and Mounts Bay (Figure 39) with the full reports of the latter two sites expected in 2022.

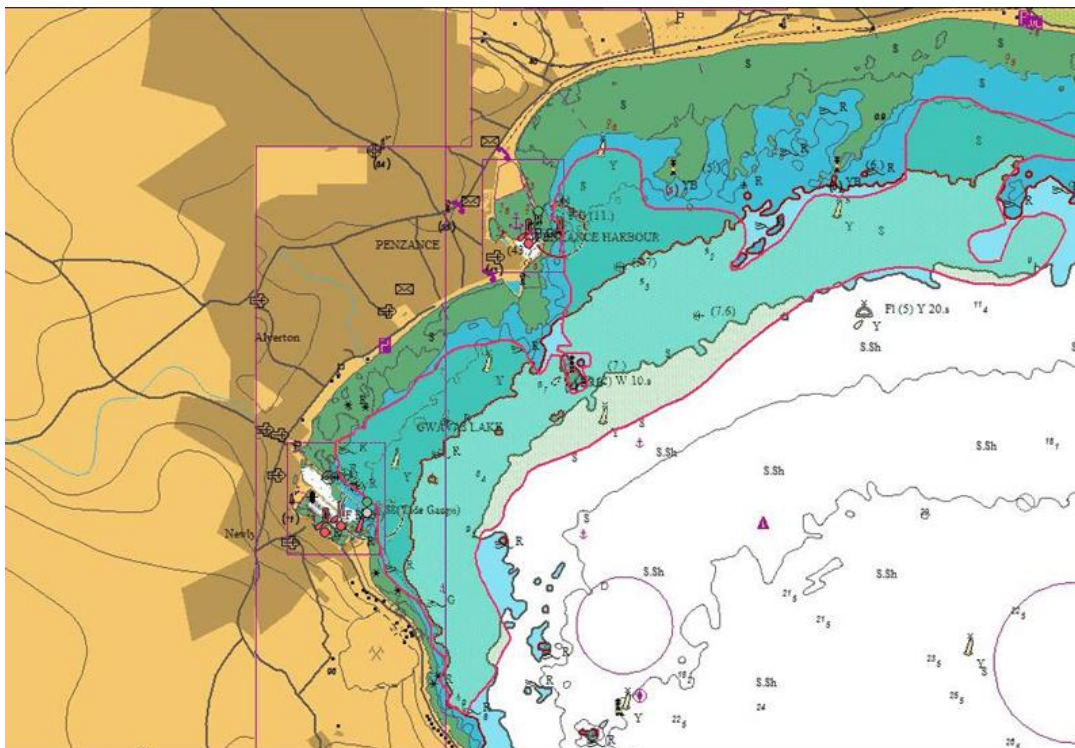


Figure 39. Theorised extent of seagrass in Mounts Bay based on initial surveys by CIFCA in 2021. The seagrass extent is shown inside the green shaded area. Source C. Trundle.

6.2.6.6 Protected Areas

There are three designations of protection relevant to the fisheries area of operation under the UK Government (Figure 40) and are described in the section below where relevant to the fishery given the fishery footprints described in section 6.2.6.3.

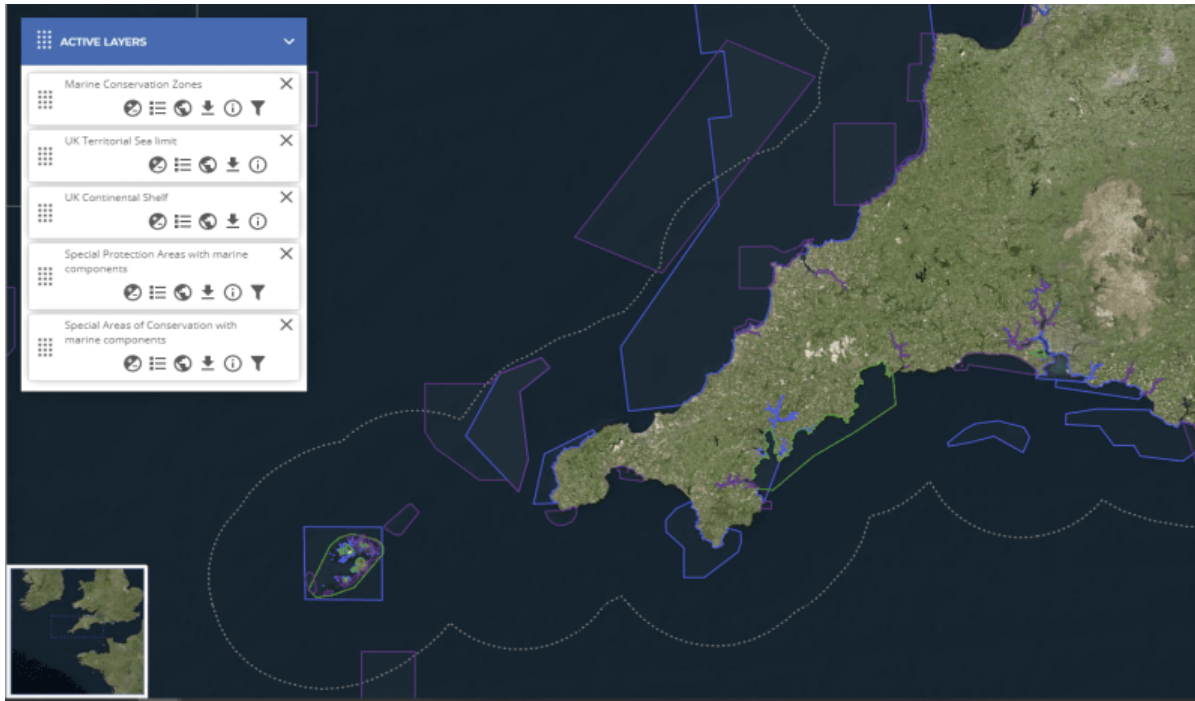


Figure 40. Map of UK designated protection areas relevant to the fishery in Cornwall and Devon. Purple polygons are Marine Conservation Zones (MCZ), blue polygons are Special Areas of Conservation (SAC) with marine components and green polygons are Special Protection Areas (SPA).

Marine Conservation Zones

In 2016, the UK government announced the first part of the tranche three of Marine Conservation Zones (MCZ) in UK waters. By 2021 the 2nd tranche has been completed. MCZs are designated under the Marine and Coastal Access Act (2009). They protect nationally important marine wildlife, habitats, geology and geomorphology in English inshore waters and offshore waters next to England, Wales and Northern Ireland. Sites are selected to protect not just the rare and threatened, but the range of marine wildlife. There are a number of MCZs within the defined area of the fishery with direct relevance to the fishery as discussed below (West to East).

Runnel Stone MCZ

Is designated for the protection of eight habitat types and one species (Pink sea-fan (*Eunicella verrucosa*)). Of the habitats three are intertidal and have no overlap with the fishery and of the remaining six only two (subtidal sand and subtidal coarse sediment) are likely to overlap with the fishery but occupy water deeper than the fishery is likely to come into contact with (> 30 m depth) (Figure 41 and Figure 42). The other four features (three high/moderate rock habitats and the pink seafan) are located on the subtidal cliff lines of the MCZ where it would be too dangerous for the UoA to operate or too deep for benthic interaction to occur (Figure 41 and Figure 42).

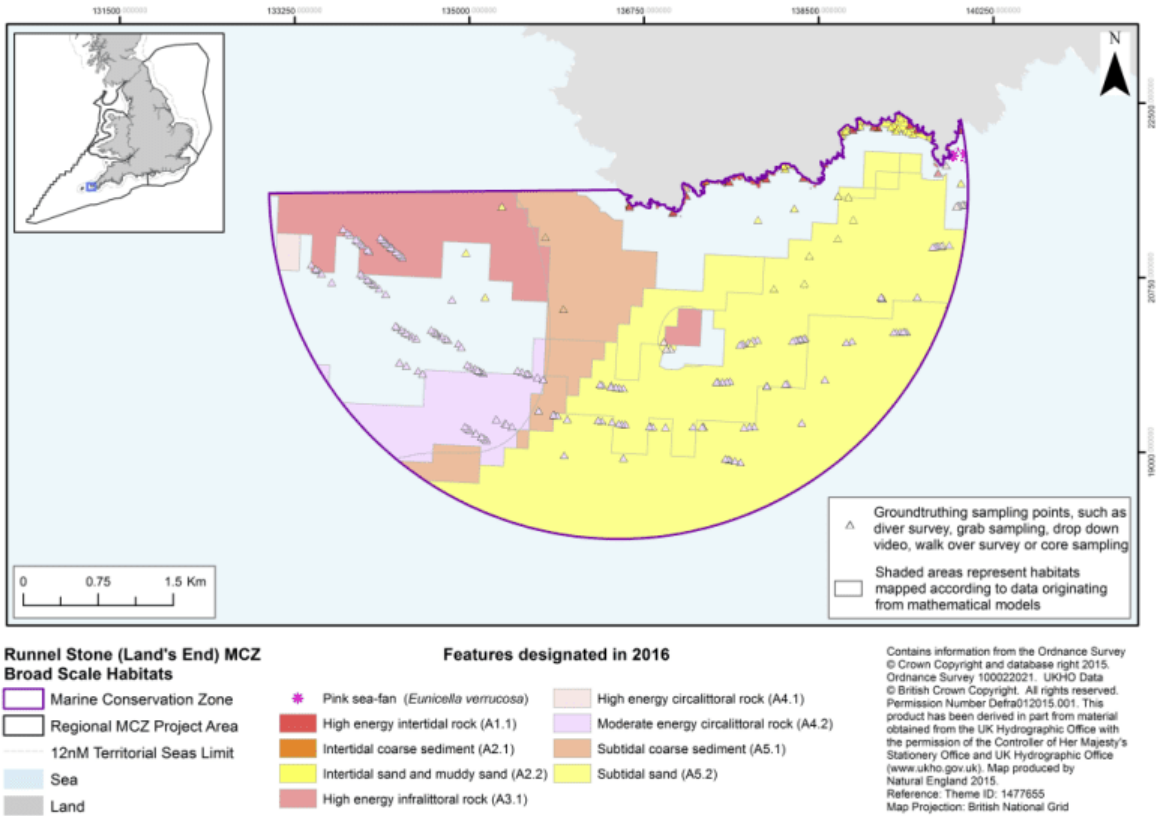


Figure 41. Runnel Stone features map. Source:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/492451/mcz-runnel-stone-feature-map.pdf

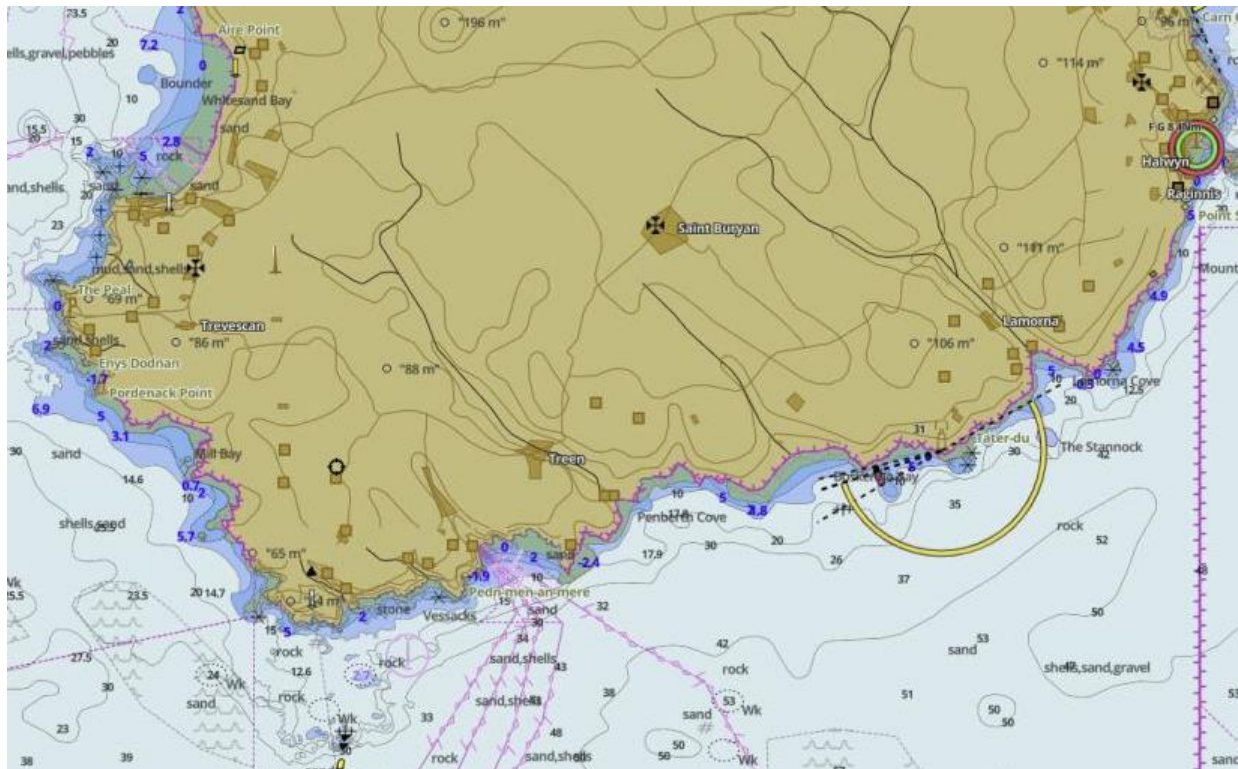


Figure 42. Bathymetry data for the Runnel Stone MCZ. Source: <http://fishing-app.gpsnauticalcharts.com/i-boating-fishing-web-app/fishing-marine-charts-navigation.html?title=Penzance+Bay+boating+app#12/50.0504/-5.6730>

Mounts Bay MCZ

Is designated for the protection of two species groups - Giant goby (*Gobius cobitis*) and Stalked jellyfish (*Haliclystus spp. Lucernariopsis spp.*) and eight habitats of which two are relevant to this fishery subtidal sand and seagrass (Figure 43, Figure 44). The other six habitats are intertidal and have no overlap with the fishery and are not considered further in this assessment. There is currently no active management regulations associated with the MCZ relevant to the UoA fishery but based on the presence of seagrass and continuing work from CIFCA there is the possibility of protective measures for seagrass here in the future which may limit ring net activity within the boundaries of the site.

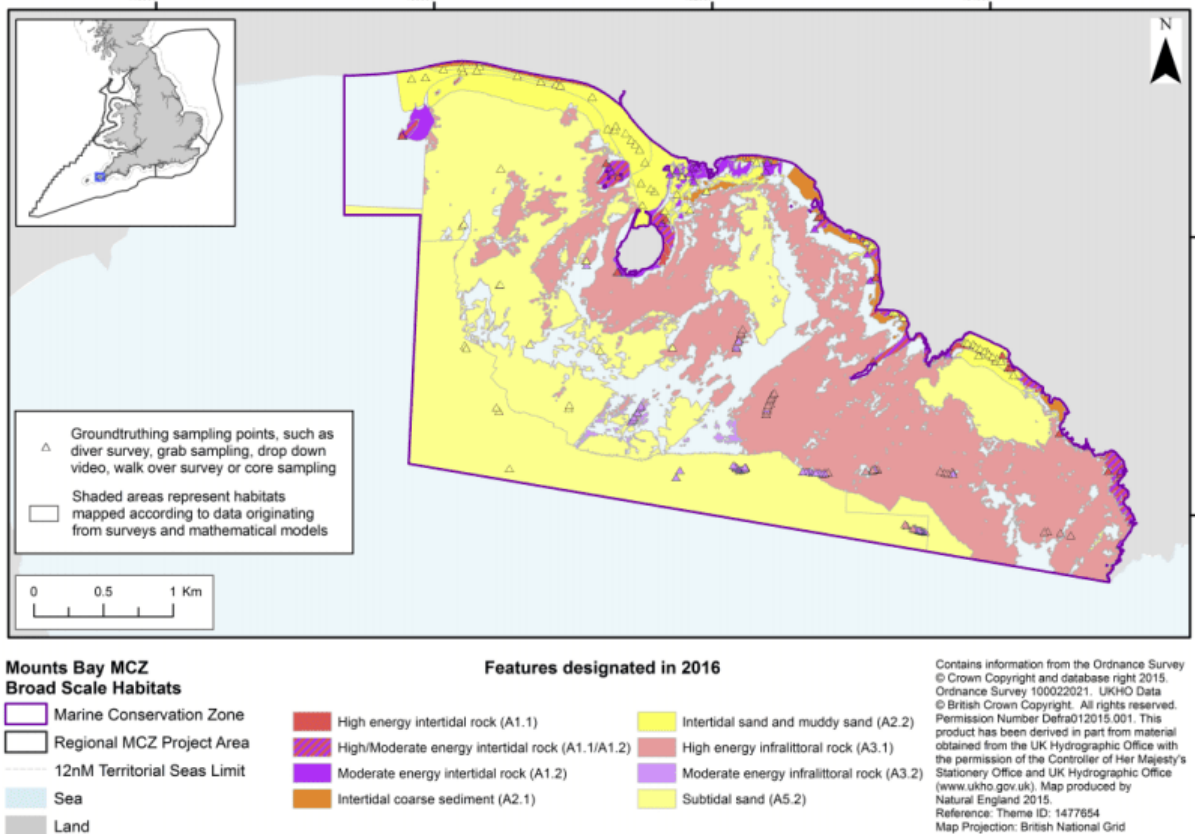


Figure 43. Mounts Bay Marine Conversation Zone (MCZ). Source: [UK Government](#).

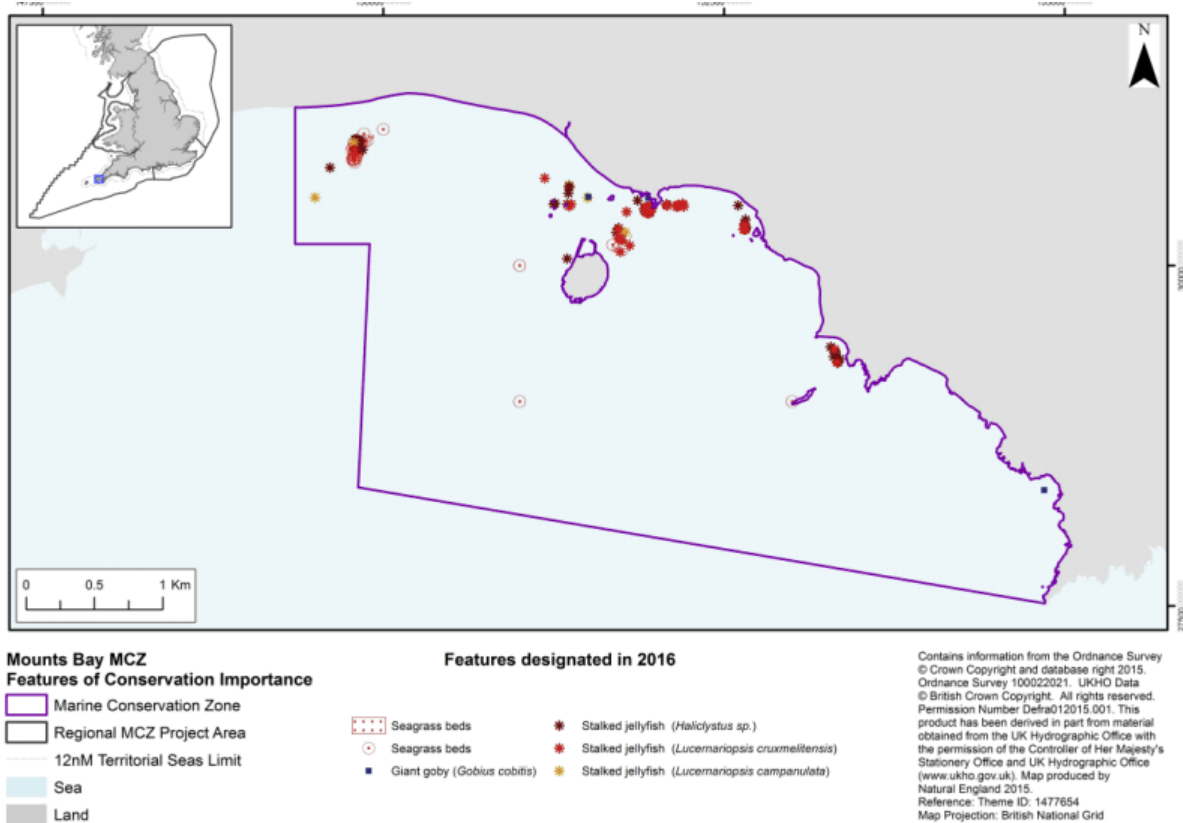


Figure 44. Mounts Bay Marine Conversation Zone (MCZ) designated features. Source [UK government](#)

Helford Estuary MCZ

This MCZ is designated for the protection of the Native oyster (*Ostrea edulis*). As reported in the Year 1 surveillance for this fishery in 2017, the introduction of the Cornwall IFCA River and Estuarine Fishing Nets Byelaw 2017 (CIFCA 2017c) prohibited all net fishing in the Helford therefore protecting this feature. The byelaw is not directed specifically to ring-netting nor the MCZ status but as a regulation to promote non-net fishing (line fishing) but by excluding all netting from the nominated waterways included the Helford ensures that the feature is not impacted by the UoA. There has been no evidence of CSMA members fishing in the restricted areas since its implementation.

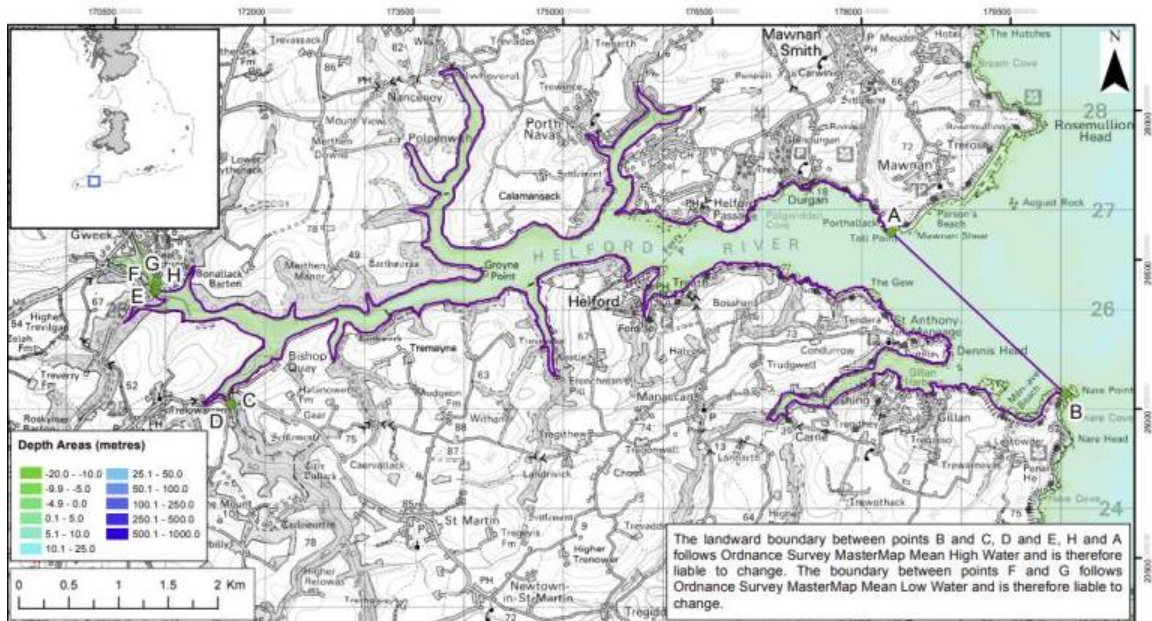


Figure 45. Helford MCZ map. Source :

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/914721/helford-estuary-mcz-boundary.pdf

Whitsand and Looe Bay MCZ

This site is designated for eight habitats and four species. As per the Mounts Bay MCZ of the eight habitats with ones relevant to this fishery subtidal sand and seagrass (Figure 46, Figure 47). The other six habitats are intertidal and have no overlap with the fishery and are not considered further in this assessment. The four species are ocean quahog (*Arctica islandica*) a burrowing bivalve, pink sea-fan (*Eunicella verrucosa*) only found on rocky ground, sea-fan anemone (*Amphianthus*) and stalked jellyfish (*Haliclystus auricula*) – found in the seagrass (CIFCA 2014) . There is a current management regulations associated with the MCZ relevant to the UoA fishery which is the Whitsand and Looe Bay Marine Conservation Zone (Fishing Restrictions) Byelaw 2018 (CIFCA 2018). This bylaw prohibits the use of "bottom towed gear" means any mobile fishing gear used for taking sea fisheries resources which during a fishing operation is in connection with the seabed or other land and not fixed by any means to the seabed or other land.

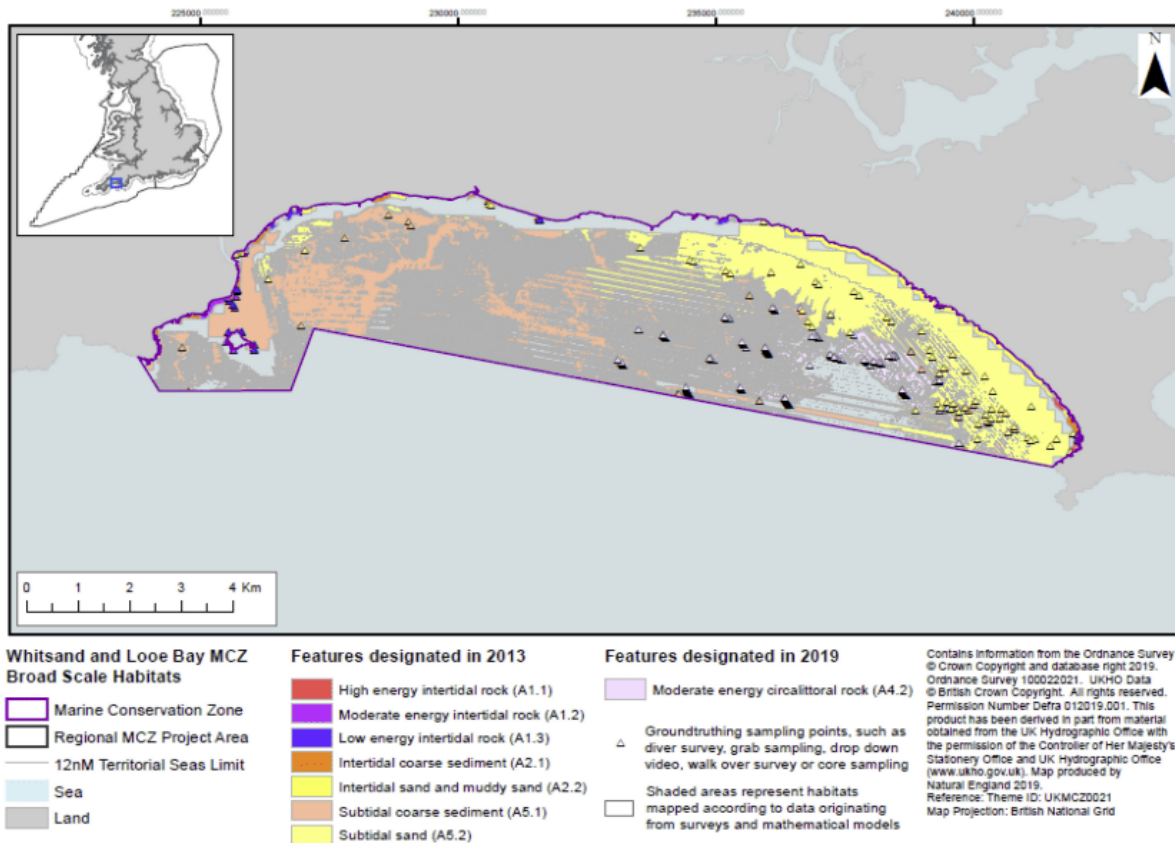


Figure 46. Whitsand and Looe Bay MCZ feature map. Source : https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/915478/whitsand-looe-bay-mcz-feature-maps.pdf

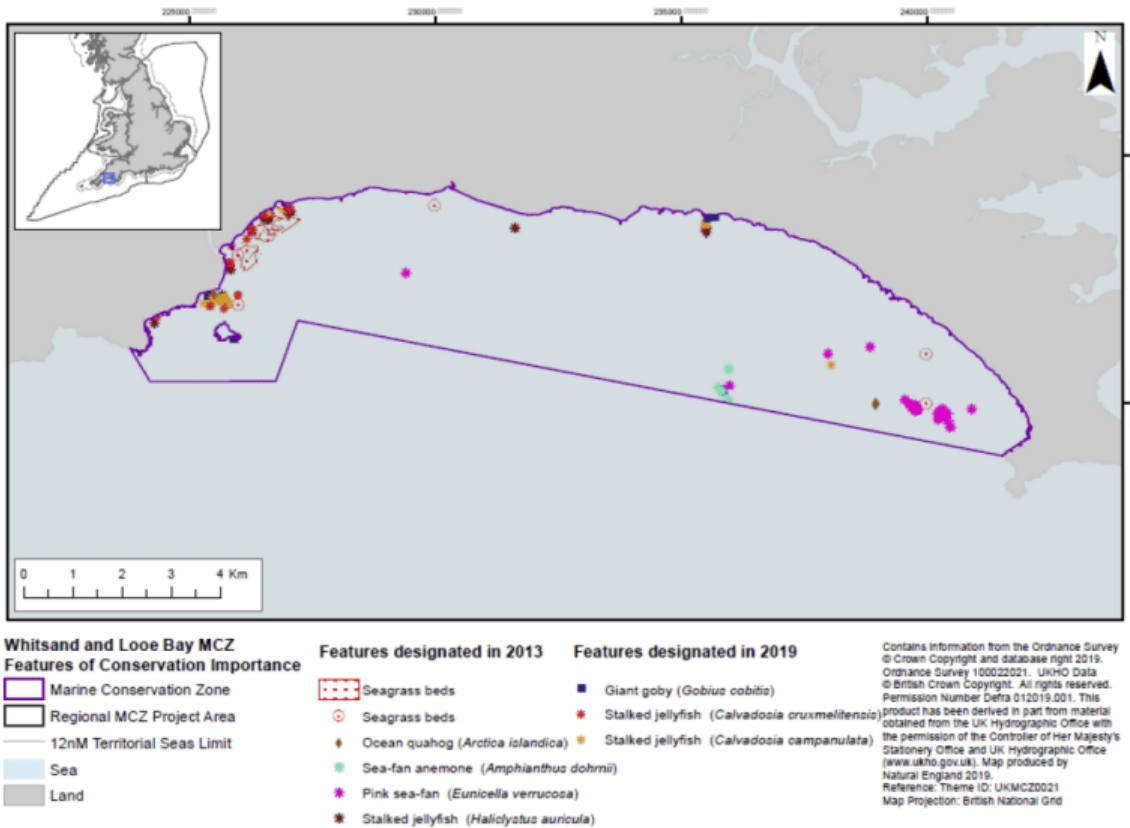


Figure 47. Whitsand and Looe Bay MCZ feature species map. Source :
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/915478/whitsand-looe-bay-mcz-feature-maps.pdf

Erme and Avon Estuaries MCZs

These MCZs are nearshore shallow inlet estuaries (maps in links below) which are not accessible by the ringnet fleet but occur with the designated area. As it is not possible for the ringnet fleets to operate in these MCZs they are not considered further in this assessment but are included here for completeness of statutory designations within the area of consideration.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/914617/erme-estuary-mcz-feature-maps.pdf

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/914486/devon-avon-estuary-mcz-feature-maps.pdf

MCZ management

The measure for the protection of the Helford estuary the estuary net bylaw (CIFCA 2017c) is discussed above and prohibits the use of ringnetting with the boundaries of the MCZ. For the Whitsand and Looe Bay MCZs the Marine Conservation Zone (Fishing Restrictions) Byelaw 2018 (CIFCA 2018) is in place.

With respect to the Mounts Bay no site-specific management measures have been proposed by Defra other than a generic objective of “*Recover to favourable condition*”. The Marine & Coastal Access Act 2009 requires the UK Statutory Nature Conservation Bodies (SNCBs) to provide advice about the status of the habitats within these MCZs (e.g. they must be monitored). There is also a statutory obligation on all management bodies (including the Marine Management Organisation (MMO) and CIFCA, who

are responsible for fisheries management in the UoA) to carry out their functions in a manner that furthers the conservation objectives for each MCZ (§125 of the Act); and the MMO / CIFCA is also able to introduce byelaws to protect MCZs if necessary (§129-133).

To date, no management agency has introduced any new management measures for the Mounts Bay nor have the UoA fleet been asked by the MMO or the SNCBs to adopt any voluntary measures to protect MCZ features.

CIFCA have indicated to the assessment team (appendix 4) that the condition of seagrass across the region is not in favourable condition (a result of non-UoA activities such as yacht anchor scarring) and therefore future management of all MCZ where seagrass is found may involve prohibition of the UoA in these areas. At present, this has not been adopted by the authority and is currently subject to ground proofing of seagrass extent with the MCZ areas for 2021-22.

6.2.6.7 European designations now under UK law

Following the exit of the UK from the EU at the end of 2020 the designations of Special Areas of Conservation (SAC) and Special Protection Areas (SPA) can no longer fall under the EU Habitats and Birds Directives (EU 2009; EU 1992). The Conservation of Habitats and Species Regulation 2017 (UK 2017) and its (Amendment) (EU Exit) Regulations 2019 (UK 2019), transposes the land and marine aspects of the Habitats Directive and the Wild Birds Directive into domestic law. As a result of the new legislation SACs and SPAs in the UK no longer form part of the EU's Natura 2000 ecological network. The 2019 Regulations have created a new class of habitat and species protection on land and at sea, including both the inshore and offshore marine areas in the UK these are known as the 'National Site Network'. The National Site Network's objectives are identical to those previously e.g. to maintain features in 'favourable conservation status (FCS)' and in almost all government pages and references in 2021 they are still referred to as SPAs and SACs, therefore we continue to use that term here.

Special Protection Area (SPA)

Within the area under consideration is the [Falmouth Bay to the St Austell Bay](#) Special Protection Area, through the SPA selection guidelines based on EC Directive 2009/147/EC on the Conservation of Wild Birds Special Protection Area (NaturalEngland 2017). The site qualifies under Article 4.1 of the Directive (2009/147/EC) as it is used regularly by 1% or more of the Great Britain population of Annex I species great northern diver, black-throated diver and Slavonian grebe in any season. As the designation is directed at seabirds rather habitats and there is no qualifying SPA habitat this area's designated features (Table 25) are considered under the ETP species component rather than the habitats component.

Special Areas of Conservation (SAC)

Lizard Point

[Lizard point](#) is a designated SAC for its rugged bedrock habitats which extend up to 9 km offshore and in 80 m of water. There is no further consideration for this SAC in this assessment of the fishery for two reasons. 1: The inshore shallow area where there is a chance of the ring net contacting the bottom is rocky and there is high chance of losing the net therefore the area is actively avoided by all fishers and there is no evidence of fishery footprint overlap. 2: the deeper area of the SAC below 30 m is out of reach of the fishery operating depth where contact between substrate and the gear is possible. Further there is no evidence of the fishery footprint in this area. The SAC is included here for completeness of statutory designations within the area of consideration only.

Fal and Helford

Fal and Helford SAC, is a SAC under the following annex 1 habitats (Figure 48). Sandbanks which are slightly covered by sea water all the time (including seagrass and maerl (*Phymatolithon calcareum* and *Lithothamnion corallioides*) beds), Mudflats and sandflats not covered by seawater at low tide, Large shallow inlets and bays, reefs and Atlantic salt meadows (saltmarsh). It has an annex 2 species shore dock (*Rumex rupestris*). According to CIFCA the competent authority there are two features which may interact with the UoA. The first is the Maerl beds but as these are principally found in the Helford and Fal estuaries these are protected by the Cornwall IFCA River and Estuarine Fishing Nets Byelaw 2017 (CIFCA 2017c) as discussed under the MCZ section – Helford MCZ there is no overlap with the UoA. Secondly, seagrass, which is found outside of the estuaries in the bay. Seagrass is discussed under section 6.2.6.4 and management of seagrass in relation to the SAC is considered in the following section (SPA and SAC management).

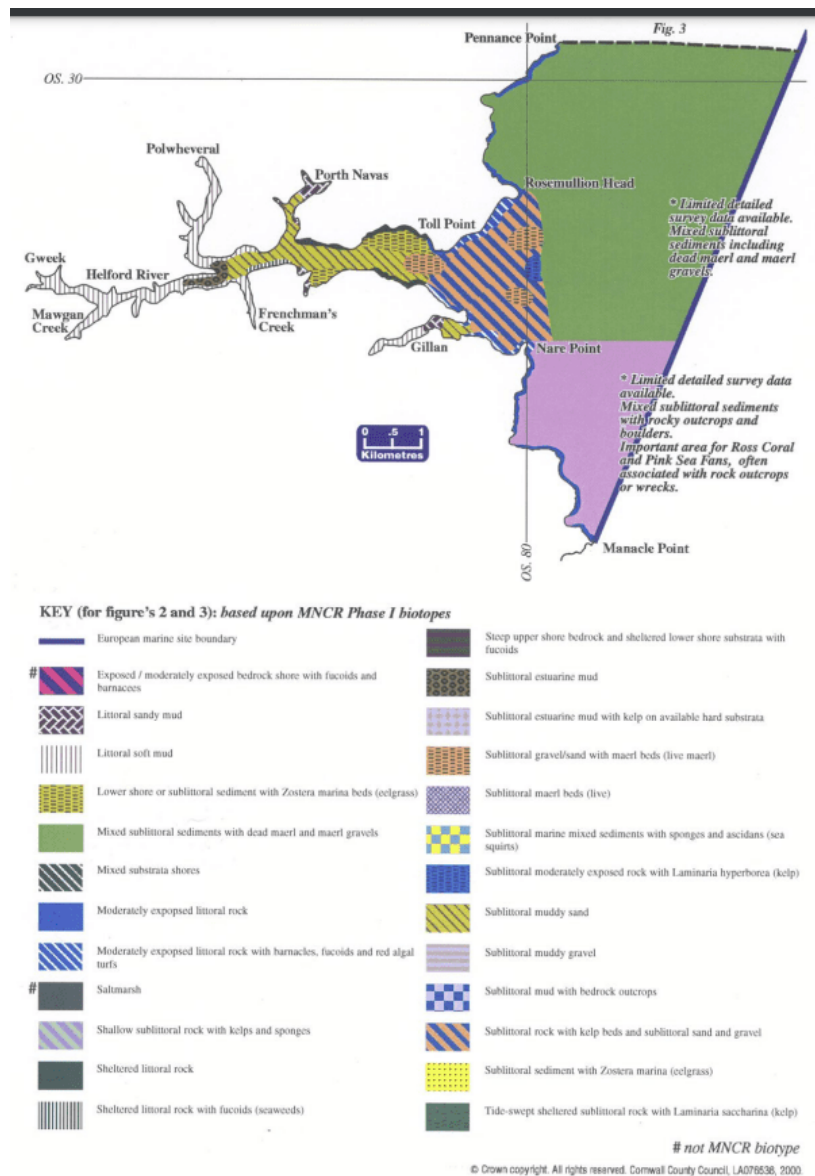


Figure 48. Fal and Helford SAC. Source: <http://publications.naturalengland.org.uk/publication/3048654>

Plymouth Sound

Is a SAC under the following annex 1 habitats. Sandbanks which are slightly covered by sea water all the time (including seagrass), Estuaries, Large shallow inlets and bays, reefs and Atlantic salt meadows (saltmarsh). It has annex 2 species shore dock *Rumex rupestris* and allis shad *Alosa alosa*.

There is very little effort from the fishery within this SAC but as per the Fal and Helford SAC above seagrass is considered by Devon and Severn IFCA to potentially overlap with the fishery and it has been fished by the Plymouth based boats in the recent past (CIFCA pers. Comm). Seagrass is discussed under section 6.2.6.4 and management of seagrass in relation to this SAC is considered in the following section (SPA and SAC management).

Under the Devon and Seven IFCA’s monitoring and control plan for the SAC in 2019, the following actions were implemented for the ringnet fleet i) monitoring the number of vessels operating in Plymouth Sound via permits issued under the mobile gear bylaw (DSIFCA 2018a), and (ii) make semi-quantitative catch observations of ring-netting activities in Plymouth Sound in 2019. These were directed at the fleet with respect to the listed feature allis shad *Alosa alosa* as part of the IFCA’s bycatch awareness and self-reporting scheme for twaite shad (*Alosa fallax*) and allis shad (*Alosa alosa*). The results of these actions showed that there is very little effort directed by ringnetters within Plymouth Sound, with the majority of effort from the two permit holders registered in Plymouth (correct as of 2019) fishing predominantly outside the Sound. Further the D & S IFCA has completed Habitat Regulation Assessments (HRAs) for ring netting on features of the Plymouth Sound and Estuaries SAC based on the mobile fishing annexes (DSIFCA 2018a; DSIFCA 2018b). These HRAs record risk using a traffic light system where the only notable habitat impact of the ringnetters to features is abrasion risk in seagrass areas (amber rating) (DSIFCA 2016a; DSIFCA 2016c; DSIFCA 2016b).

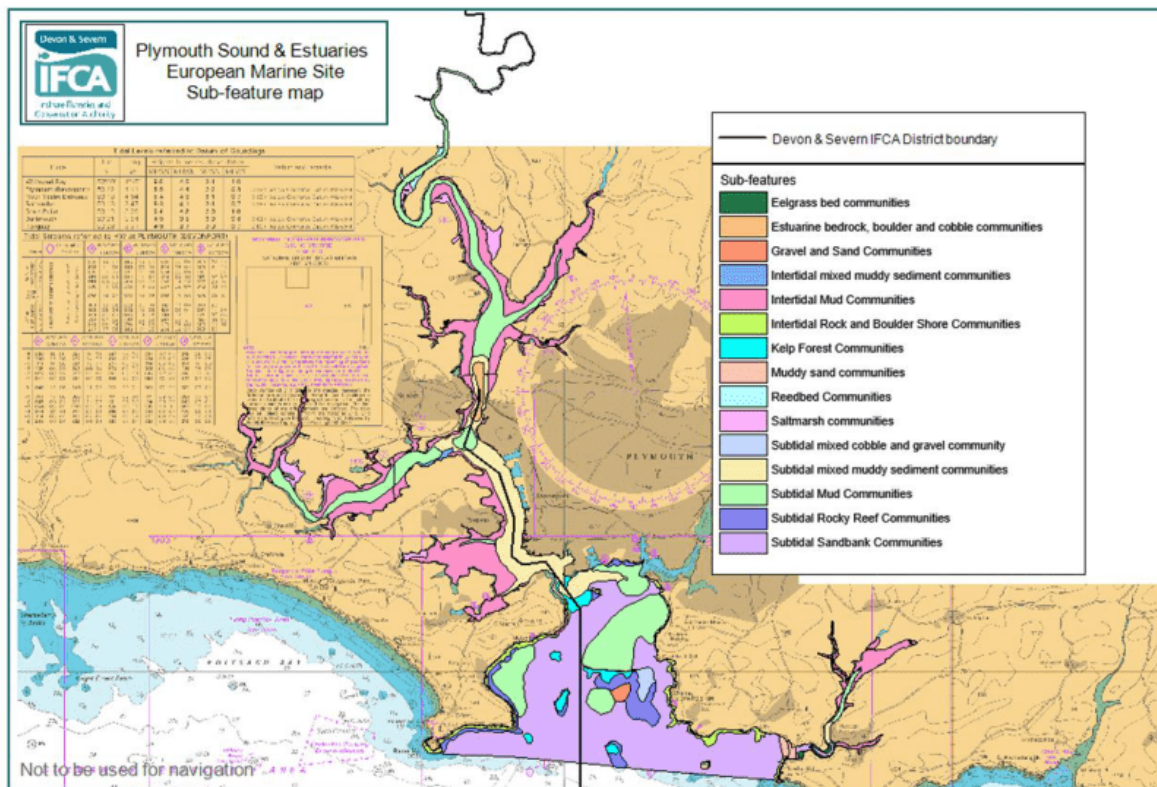


Figure 49. Site feature map of the Plymouth Sound and Estuaries EU marine site. Source: DSIFCA (2016b)

Start Point to Plymouth Sound & Eddystone SAC

This SAC is designated under the annex 1 habitat reefs. Although the SAC sits within the potential footprint of the fishery, there is no known overlap with this SAC and the UoA as the ground is unsuitable in shallow water to deploy ring nets and the area includes ground too deep to be impacted by the gear. The SAC is included here for completeness of statutory designations within the area of consideration only.

SPA and SAC management

The National Site Network's objectives are identical to those previously under the EU habitats and bird directives e.g. to maintain features in 'favourable conservation status (FCS)'. The main management instrument for assessing the risk posed by the UoA to these sites are Habitats Regulations Assessments (HRA). These are compiled by a competent authority and in the case of fishing in Cornwall this is the Cornwall IFCA whilst in Devon it is the Devon and Severn IFCA.

From all the SAC management areas, there are two Cornish byelaws which protect features considered to be at risk from the UoA in the SAC areas.

1. Cornwall IFCA River and Estuarine Fishing Nets Byelaw 2017 (CIFCA 2017c) which prevents netting activity in the Helford and Fal estuary and protects the Maerl bed feature.
2. Closed Areas (European Marine Sites) No 2 byelaw (CIFCA 2012), which prevents towed gear (including ringnets) being used within the boundaries of the marine sites if they are in contact with the seabed.

Three vessels within the CSMA (those registered in Plymouth) are permitted to fish within Devon waters and have been issued mobile Fishing Permit from the D&S IFCA under their Mobile Fishing Permit Byelaw. Under the permit condition 3.4 it states:

3.4 In the areas as defined by the coordinates set out in the attached Annex 4 of this Permit (Plymouth Sound and Estuaries Special Area of Conservation), (including the rivers Plym, Tamar, Tavy and Yealm) a permit holder or named representative is not authorised to use demersal mobile fishing gear except where; access is authorised for an encircling net where the footrope may be in contact with the seabed to be used in the area as defined by the coordinates set out in the attached Annex 4a of this Permit. (Figure 50).

Annex 4a Plymouth Sound and Estuaries - Access to vessels using encircling nets in accordance with paragraph 3.4 of the mobile fishing permit byelaw conditions

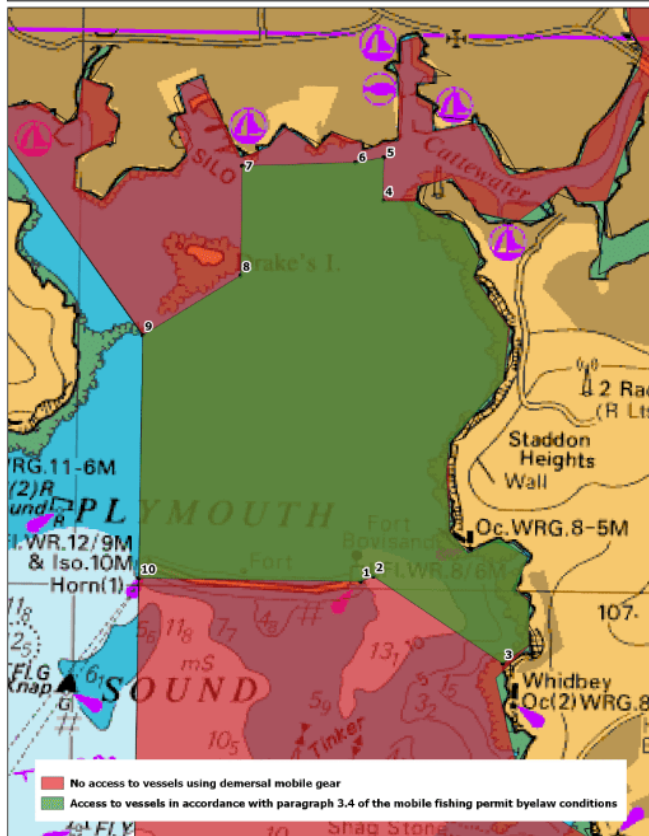


Figure 50. Plymouth Sound and Estuaries Special Area of Conservation - Access area to vessels using encircling nets in accordance with paragraph 3.4 of the Mobile Fishing Permit Byelaw Category One Permit Conditions. Source: DSIFCA (2018b)

6.2.7 Ecosystem

6.2.7.1 Overview

The ecosystem in the UoA operates is the Celtic Sea within the Celtic Sea Eco-region as defined by ICES (ICES 2020a). According to ICES the Celtic Sea Eco-region comprises of three main regions the Malin shelf, the Celtic Sea and west of Ireland and the Irish Sea (ICES 2020a) (Figure 51). ICES list 10 key signals of change in the environment and ecosystem for this region. These are:

- Overall rise in sea surface temperature since the 1950s;
- Change in migration, distribution, and onset of spawning of blue whiting *Micromesistius poutassou*, Northeast Atlantic mackerel *Scomber scombrus*, western horse mackerel *Trachurus trachurus*, and boarfish *Capros aper* caused by the changing temperature;
- Change in recruitment of gadoids due to temperature;
- High species richness in the Celtic sea portion of the ecoregion;
- Decline in shelf and oceanic phytoplankton abundance and change in species composition of zooplankton to warmer water species;
- Decline in seabirds overall since 2000, whilst grey seal populations have increased for the past 30 years. Trends in other cetaceans are not known;

- Decrease in overall fishing pressure since 1998 with more stocks closer to F_{MSY} ; and,
- Reduced the spatial fishing footprint and the average number of times the seabed is trawled per year.

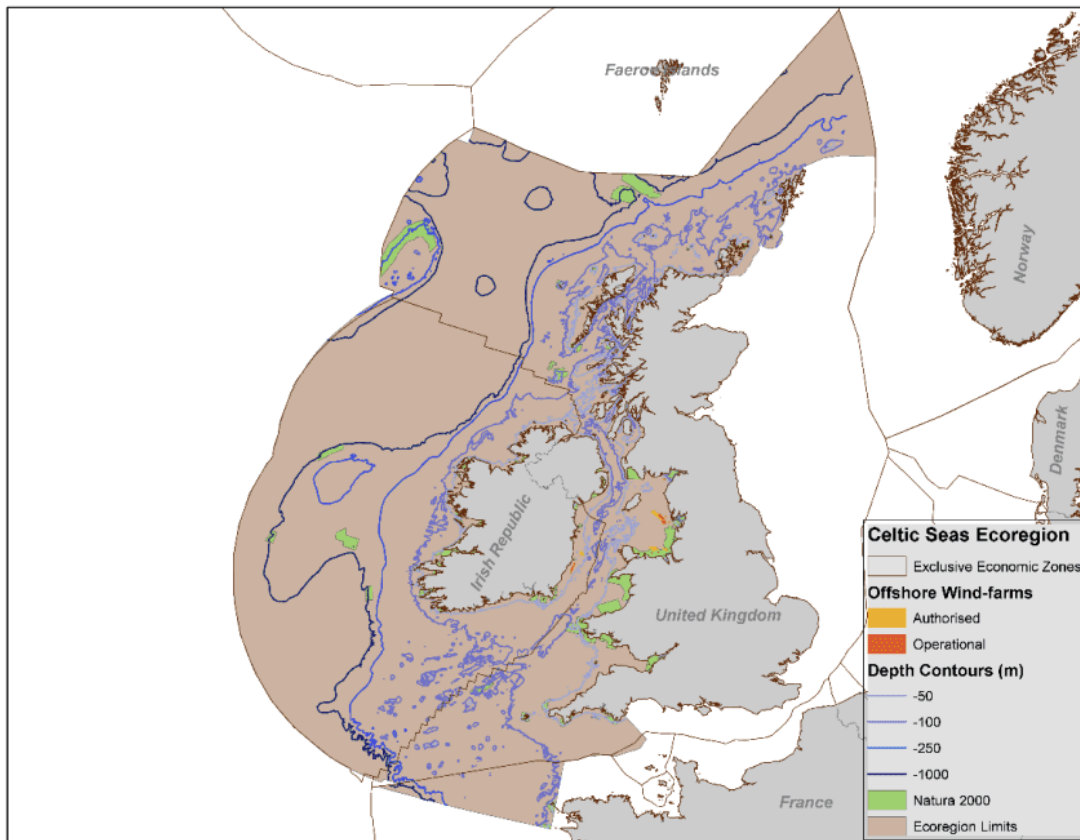


Figure 51. The Celtic Seas ecoregion, showing EEZs, larger offshore Natura 2000 sites. Source (ICES 2020a)

The main pressures on the ecosystem include fishing (Figure 52), but pelagic species (sardine functional group) stock status and time series shows the group as a whole are maintained above $BMSY_{trigger}$ (Figure 53). Threats to depleted fish (elasmobranchs), marine mammals and seabirds are noted for deep sea trawl fisheries and gillnet fisheries, whilst there is no reference to purse seine / ring nets for these threats. Equally abrasion of the seabed at the ecosystem scale does not list purse seine / ring nets as a contributing factor (ICES 2020a).

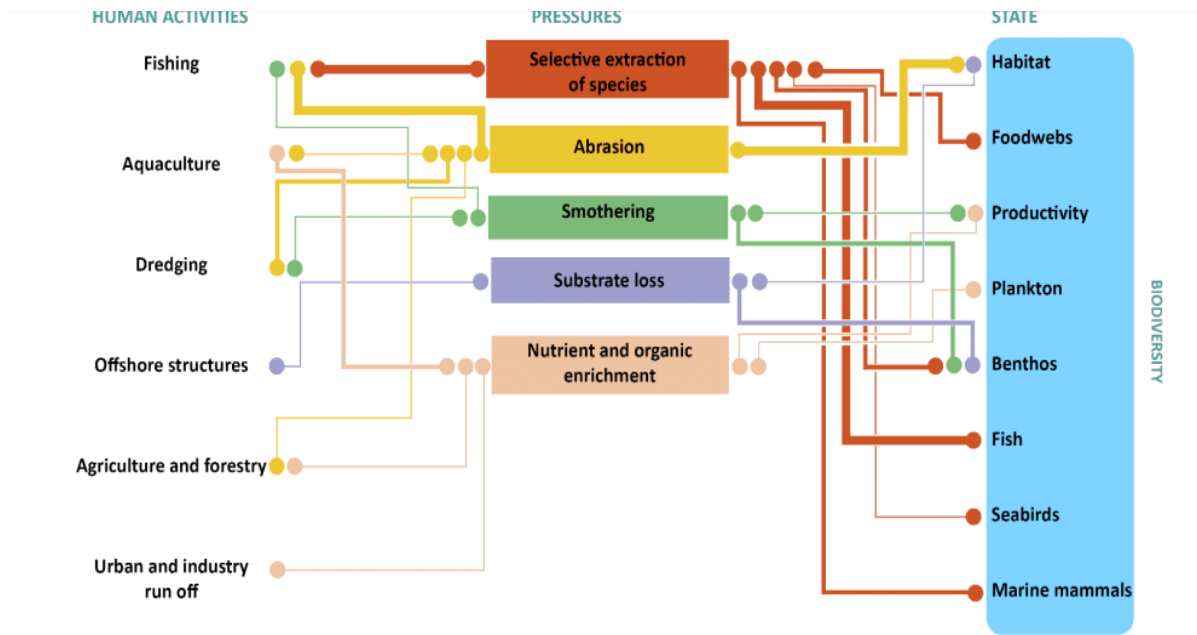


Figure 52. Celtic Sea ecoregion overview with the major regional pressures, human activities, and ecosystem state components. The width of lines indicates the relative importance of main individual links (the scaled strength of pressures should be understood as a relevant strength between the human activities listed and not as an assessment of the actual pressure on the ecosystem). Source (ICES 2020a).

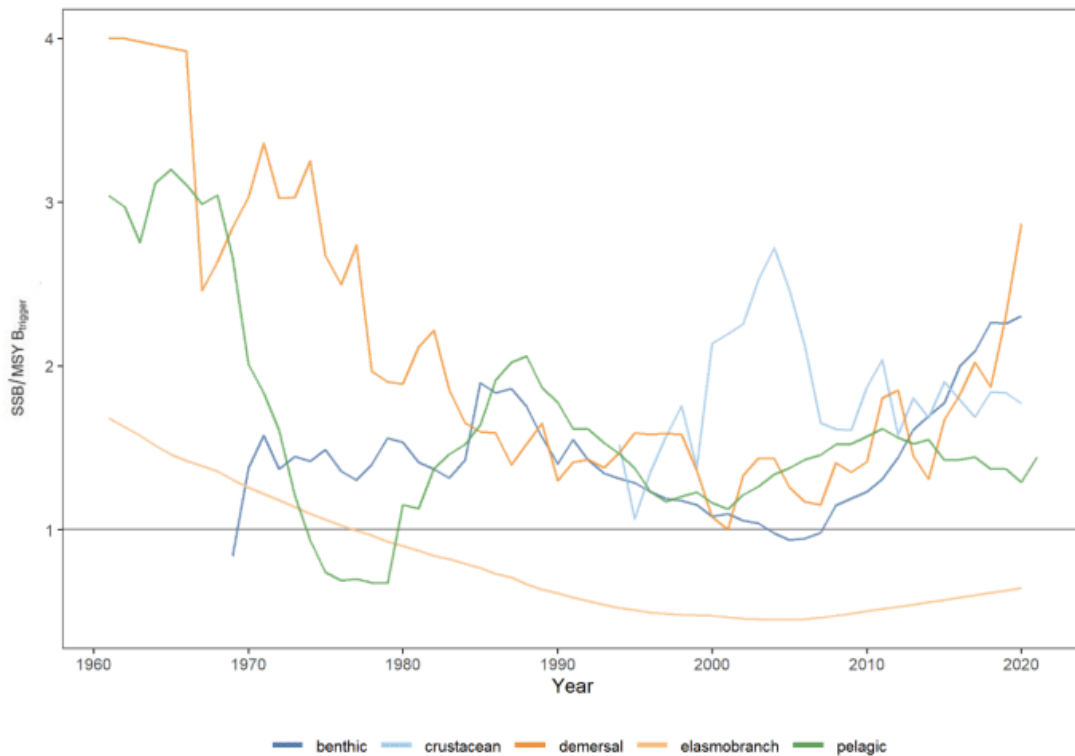


Figure 53. Time-series of annual relative biomass (SSB to B_{MSY} trigger ratio) by fisheries guild. Source (ICES 2020a).

6.2.7.2 Ecosystem modelling

Ecosystem modelling of the Celtic sea now includes food web dynamics and examining pressure points for ecosystem change as a result of climate change (Hervann et al. 2020; Lauria 2012).

Sardines can be an important prey species to support fish higher in the food web, but the main predator species in the Celtic Sea Eco-region (hake, megrim, monkfish, whiting, cod and saithe) are all generalist feeders which show size-dependent, temporal and spatial prey-switching behaviour. CEFAS also agree that there are no known predators that are entirely reliant on their presence (Personal Communications, Jeroen Van Der Kooij, CEFAS, 6th July 2015).

The relationship between different foodweb components of the Celtic Sea ecosystem have been investigated using the Ecopath simulation model, with the aim of examining the effect of climate change and other anthropogenic factors (including fishing). One of the key outputs of this study was a model showing the relationship between different functional groups in the ecosystem in terms of their relative biomass, predator-prey relationships and trophic level (see Figure 17). This study also confirmed that the abundance of sardine (as grouped within the small pelagic spp. functional group) was unlikely to significantly affect the abundance of seabirds in the Celtic Sea (Lauria 2012).

Changes in small pelagic abundance due to water temperature have been noted for decades and a major change was noted in the 1960s when cooler water temperatures were thought to inhibit the spawning of sardines (ICES 2014). A reduction in herring populations has been noted throughout the Celtic Sea Eco-region in recent years as waters have warmed, although untangling this from fishing pressure is uncertain. Herring and sardine have similar diets but showed limited spatial overlap because of their, respectively, warm and cold water affinities. Celtic Sea Ecospace modelling suggests that these temperature changes has led to a decrease in the productivity of most of boreal species (Hervann et al. 2020). This includes herring, sprat, cod, whiting and haddock, and has led to an increase in the productivity of functional groups with warm water affinity, particularly species with extreme thermal preference such as sardine, sea bass, mixed medium pelagic fish [mainly anchovy (*Engraulis encrasicolus*)] and cephalopods, and to a lesser extent, widely distributed pelagic species such as mackerel, horse mackerel and boarfish (Figure 55). The authors caution that in future years, these trends in species productivity may impair the recovery of some current commercially-important species (i.e., gadoids) and oblige fishers to target less exploited warm-water species (Hervann et al. 2020).

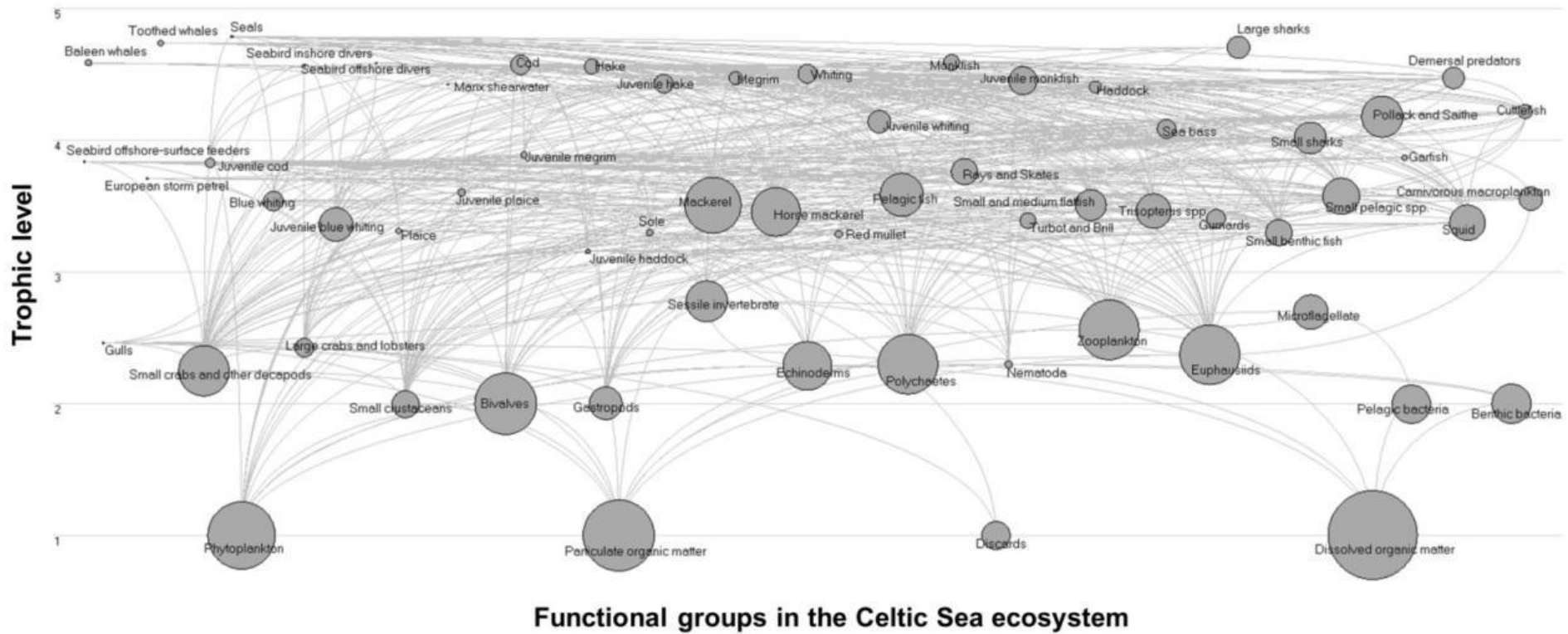


Figure 54. The Celtic Sea Ecopath model in terms of relative biomass (size of circles) and its major energy flows within Functional Groups (FGs). Source (Lauria 2012)

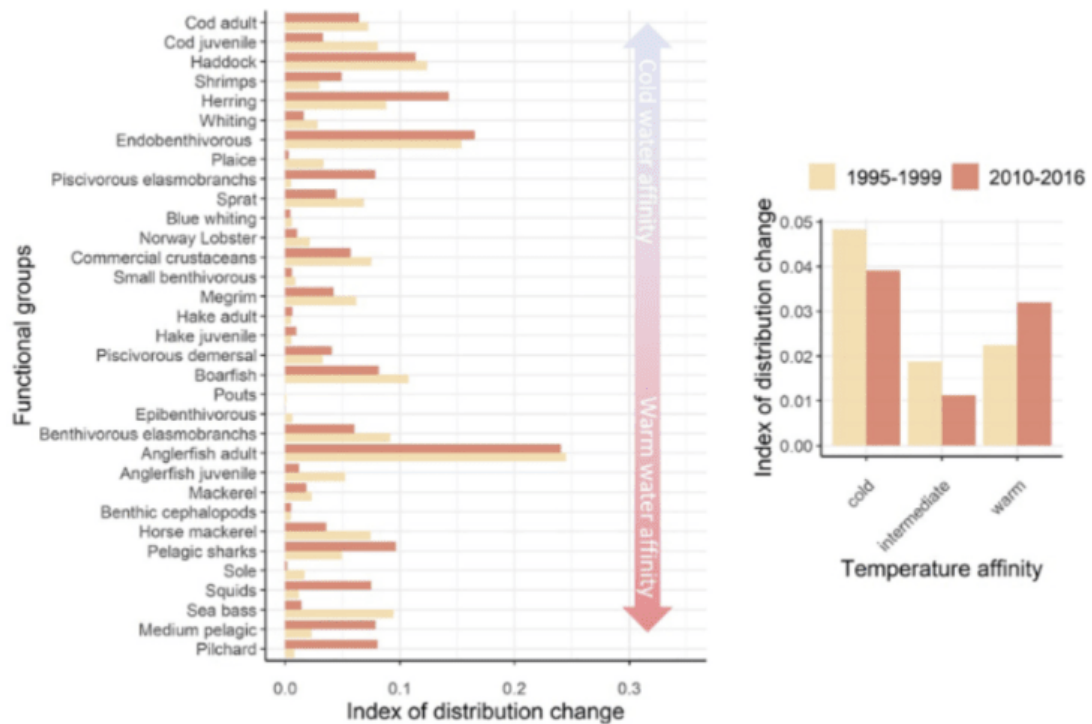


Figure 55. Index of change in the spatial distribution of functional groups' habitat in relation to their thermal preferences between the 1985–1989 and 1995–1999 periods and between the 1985–1989 and 2010–2016 periods: Left: Values by functional group and averages over functional groups according to their temperature preference. The index is the absolute difference between 1 and the slope of the linear regression between Ecospace model cells' values of relative habitat for the 1985–1989 period and the two other periods. Source (Hernvann et al. 2020).

6.2.7.3 Ecosystem monitoring

As reported in the last PCR for this fishery (Cieri et al. 2017) CEFAS initiated integrated ecosystem surveys, on board the RV Cefas Endeavour, every autumn, since 2012. The data collected has brought novel insights into the abundance and distribution of various small pelagic fish species, as well as the environmental drivers. The survey provides an annual opportunity to monitor not just the pelagic fish populations, but also the state of marine environment in the region.

The PELTIC surveys has collected the first data on the distribution and abundance, and spawning events, of sardine (pilchard) in the northernmost limit of its distribution since the 1960s; facilitated the first stock assessment for sprat in the channel; first evidence of an overwintering hotspot for Europe's only critically endangered seabird (the Balearic shearwater); and the first fisheries independent observations on the increase in bluefin tuna in the wider area.

Survey reports are published annually (CEFAS 2019; CEFAS 2020b) with specified objectives which vary year on year to accommodate research needs but typically include a suite of environmental parameters to monitor ecosystem health for OSPAR, UK and ICES ecosystem objectives (UK 2010a):

- Carry out a fisheries acoustic surveys of small pelagic species abundance and distribution (Figure 57);
- Trawl for small pelagic species to allow analysis of species -size compositions, age and stomach contents;

- Conduct plankton surveys to identify species, maturity and spawning areas;
- Abiotic vertical water surveys of chlorophyll, oxygen, salinity temperature and nutrients;
- Record the locations, species, numbers and activities of seabirds and marine mammals in the survey area during daylight hours (Figure 58).

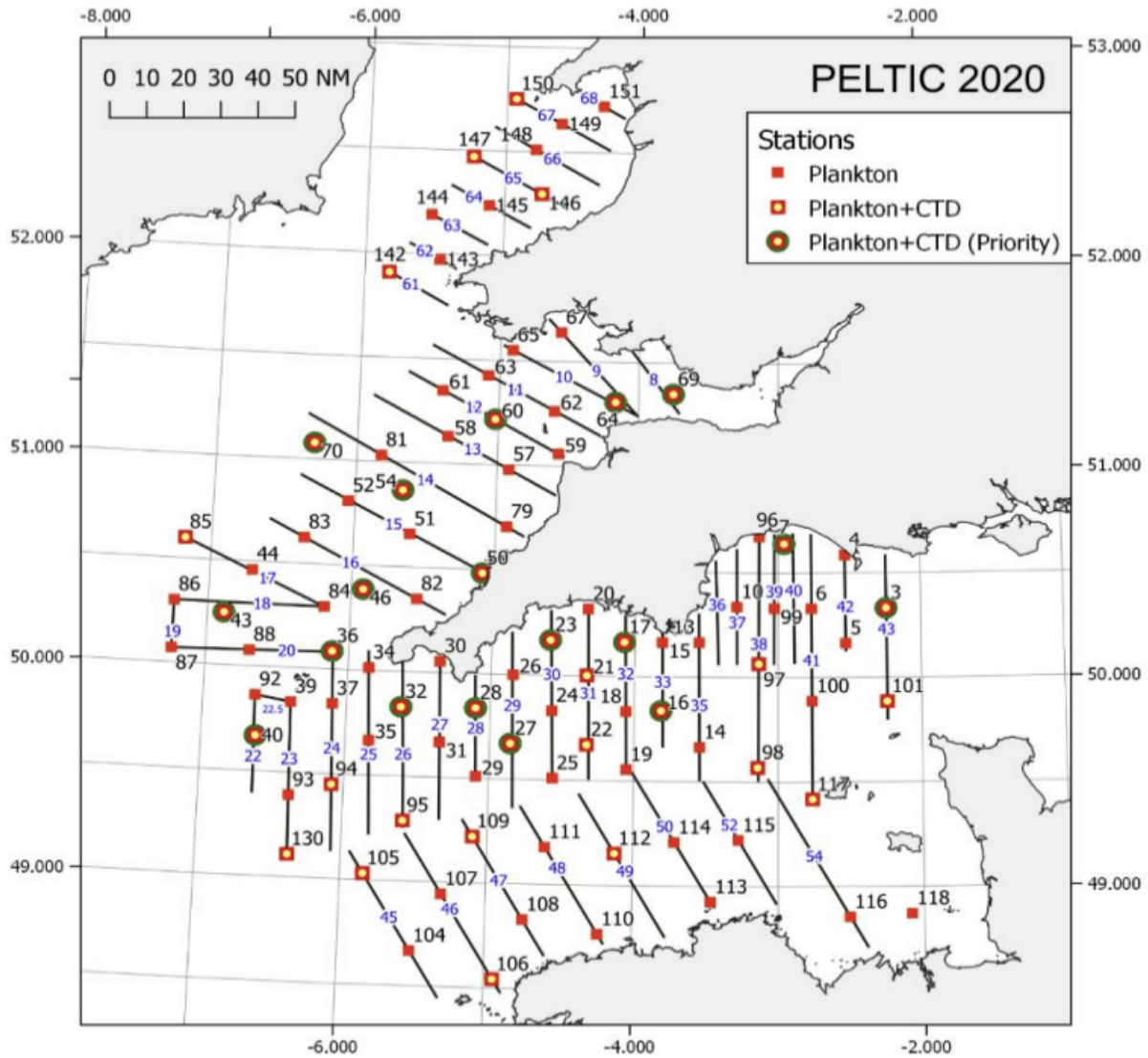


Figure 56. Overview of the planned PELTIC survey area for 2020, with the acoustic transect (black lines, numbers in blue), plankton stations (red squares) and hydrographic stations (yellow circles). Priority stations indicated in green. Source CEFAS (2020b).

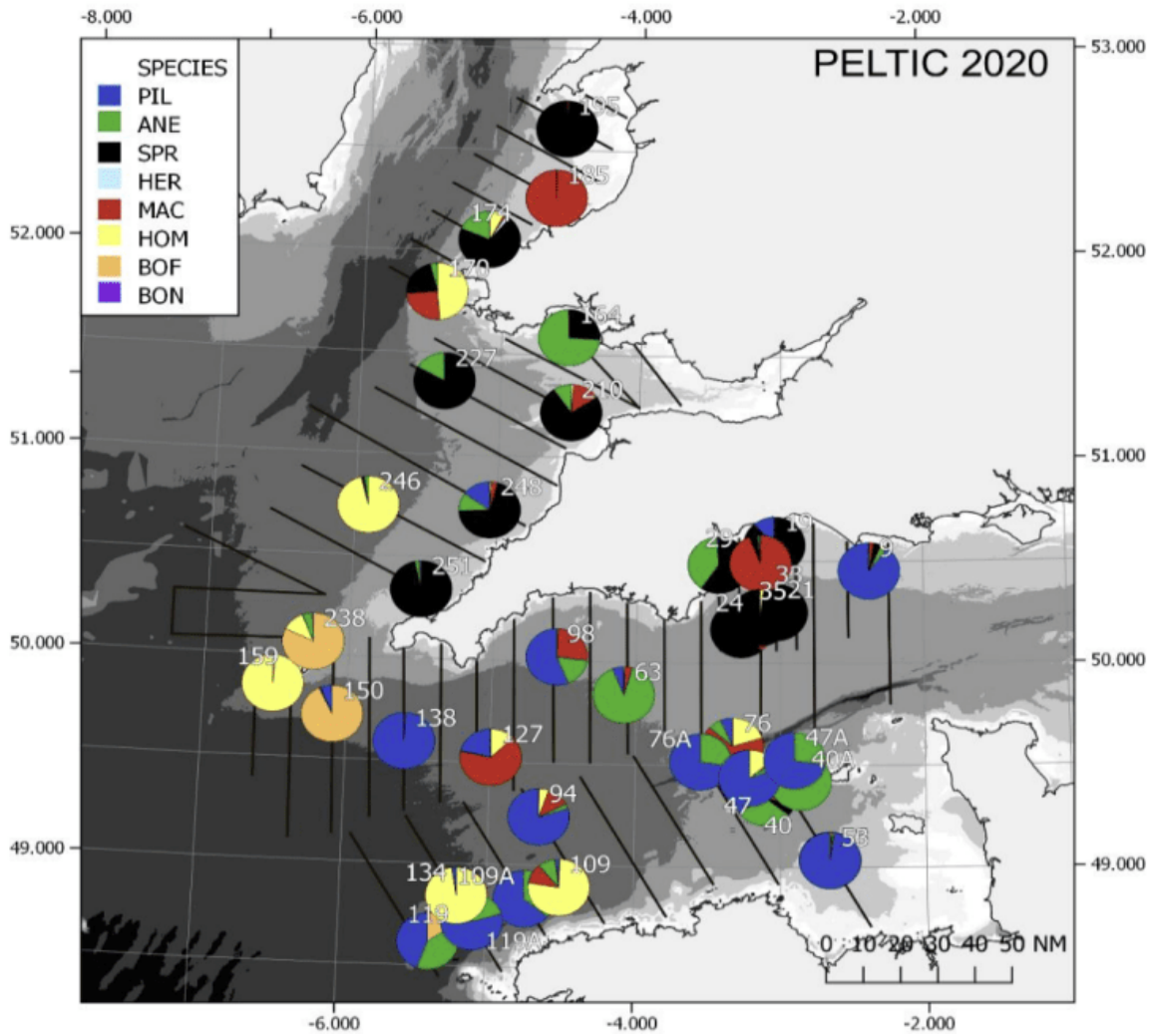


Figure 57. Overview map of the PELTIC 2020 survey area. Acoustic transects (black lines) and Trawl stations (pies) with relative catch composition by key species. Three letter codes: PIL=sardine, ANE=anchovy, SPR=sprat, HER=herring, MAC=mackerel, HOM= horse mackerel, BOF=Boarfish, BON=Atlantic bonito. Source CEFAS (2020b).

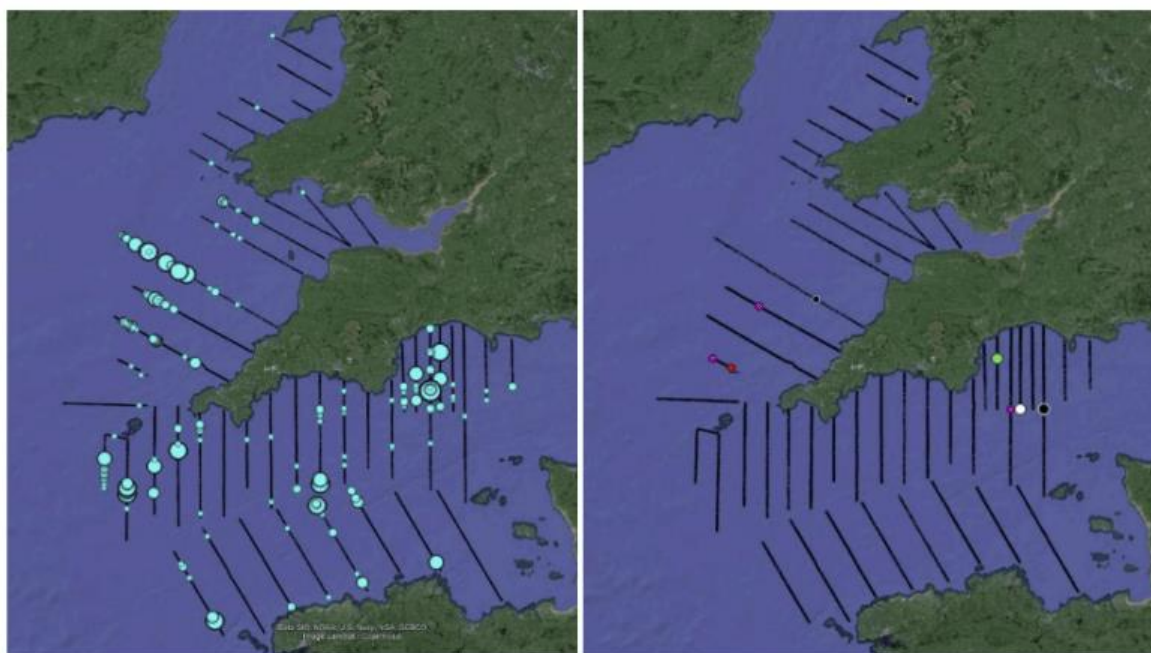


Figure 58. Distribution of Common Dolphin sightings (left, light blue circles), scaled to abundance. (small to large circles: 1-5, 6-10, 11-20, 20+) and distribution of other cetacean species sightings (right) in 2020. Black dot = Bottlenose Dolphin, green dot = White-beaked Dolphin, white dot = Risso's Dolphin, red dot = Fin Whale and pink dot probable Fin whale. Black lines show survey effort. Source CEFAS (2020b).

6.2.8 Cumulative impacts

The MSC introduced requirements for cumulative impact assessments in Principle 2 with the release of the Fisheries Certification Requirements v2.0. These requirements are to ensure that MSC certified fisheries will no longer cumulatively be at risk of generating negative impacts on Principle 2 species (and habitat).

- For primary species, cumulative impacts assess whether the collective impact of overlapping MSC fisheries are hindering the recovery of 'main' primary species that are below a point of recruitment impairment (PRI); i.e. ensuring that the combined impact of MSC fisheries are not harming the recovery of the stock; if relevant this is scored at PI 2.1.1 Sla SG80.
- For secondary species, the same intent applies when a species is below a biologically based limit, but only in cases where two or more MSC fisheries have 'main' catches that are 'considerable', defined as a species being ten per cent or more of the total catch; if relevant this is scored at PI 2.2.1 Sla SG80.
- For ETP species, the combined impacts of MSC fisheries on all ETP species needs to be evaluated, but only in cases where either national and/or international requirements set catch limits for ETP species and only for those fisheries subject to the same national legislation or within the area of the same binding agreement'; if relevant this is scored at PI 2.3.1 Sla SG80.
- For habitats, in contrast, cumulative impacts are evaluated in the management PI (PI 2.4.2). The requirements here aim to ensure that the impacts of all fisheries (including non-MSC fisheries) on habitats, including vulnerable marine ecosystems (VMEs), are managed cumulatively to ensure serious and irreversible harm does not occur; this is scored for all

fisheries and habitat types at Sla SG100. If relevant, there is also consideration of the UoA's compliance with VME management measures established by other fisheries at SId SG80.

Outcome Performance Indicator	Element	Cumulative impact?	Rationale
2.1.1 Primary species (main)	None	N/A	N/A
2.2.1 Secondary species (main)	None	N/A	N/A
2.3.1 ETP outcome	Common dolphin (<i>Delphinus delphis</i>) Harbour porpoise (<i>Phocoena phocoena</i>)	Yes	This is accounted for in 2.3.1a
2.4.2 VME management	None	No	There is no evidence of any protection measures other than statutory designations being in place for other MSC UoAs (Cornish hake) in subarea 7 or non MSC fisheries

6.2.9 Scoring elements

Table 31. Principle 2 scoring elements

Component	Scoring elements	Designation	Data-deficient
Primary	Sole Division 7.e Mackerel NE Atlantic Horse Mackerel Plaice Division 7.e Hake - Northern stock Atlantic bluefin tuna	All Minor	no
Secondary	minor scoring elements identified in Table 15 and Table 16	All minor	no
ETP	Common dolphin (<i>Delphinus delphis</i>) Harbour porpoise (<i>Phocoena phocoena</i>) Black back gull (<i>Larus marinus</i>), Herring gull (<i>Larus argentatus</i>) Grey seals (<i>Halichoerus grypus</i>)	ETP	no
Habitats	Commonly encountered: circalittoral fine sand circalittoral muddy sand, circalittoral coarse sediment. VME Seagrass Maerl beds Minor high energy circalittoral rock, orange and high energy infralittoral rock		no

6.2.10 Principle 2 Performance Indicator scores and rationales

Scoring table 6. PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guide post	Main primary species are likely to be above the PRI. OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are highly likely to be above the PRI. OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorise this species as main , to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.
	Met?	N/A	N/A	N/A

Rationale

Based on the evidence presented in section 6.2.2, there is strong evidence that no main primary species are caught by this fishery (no species with percentage composition >5% and no less resilient stocks) and therefore this [MSC interpretation applies](#) and the team determines that the UoA has no impact on this particular SI, **N/A**

b	Minor primary species stock status		
	Guide post	Minor primary species are highly likely to be above the PRI. OR	

	Met?

If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.

Yes

Rationale

The following table shows the stocks considered Primary minor in this assessment, their status relative to reference points and whether they meet the SG100 guidepost against the likelihood of being 85% probability of >PRI.

Primary species/stock	Reference latest ICES advice	Status and comment	Scoring outcome
			SG100 met
Sole Division 7.e	ICES (2021e)	$F < F_{MSY}$, $B > MSY_{trigger}$	Yes
Mackerel NE Atlantic	(ICES 2020b)	$F < F_{MSY}$, $B > MSY_{trigger}$	Yes
Horse Mackerel Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k (Northeast Atlantic)	(ICES 2021b)	$F > F_{MSY}$, $B \sim B_{lim}$, The 1 st part of SG100 cannot be met due to the stock being $B \sim B_{lim}$ (Proxy for PRI), however the estimated catch of the UoA per annum does not typically exceed 10 t (although in 2019/20 it was over 100 t) (Table 15). The ICES is for catches not exceeding 81,376 t and with a spawning biomass of a million tonnes, the UoA is highly unlikely to hinder the recovery and rebuilding (GSA3.4.6 was referenced by the team in guiding this decision).	Yes
Plaice Division 7.e	ICES (2021c)	$F > F_{MSY}$, $B > MSY_{trigger}$	Yes
Hake - Northern stock	ICES (2021d)	$F > F_{MSY}$, $B > MSY_{trigger}$	Yes
Atlantic bluefin tuna	ICCAT (2019)	Overfishing = no. Stock \sim MSY based on F proxies	Yes

References

ICCAT, 2019. REPORT OF THE 2017 ICCAT BLUEFIN STOCK ASSESSMENT MEETING - revised 2019, ICCAT, 2019 SCRS REPORT.

ICES, 2021c. Hake (*Merluccius merluccius*) in subareas 4, 6, and 7 and divisions 3.a, 8.a–b, and 8.d, Northern stock (Greater North Sea, Celtic Seas, and the northern Bay of Biscay), ICES Advice on fishing opportunities, catch, and effort Bay of Biscay and Iberian Coast, Celtic Seas, and Greater North Sea ecoregions Published 30 June 2020. Available at: [https://www.ices.dk/sites/pub/Publication Reports/Advice/2020/2020/hke.27.3a46-8abd.pdf](https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2020/2020/hke.27.3a46-8abd.pdf).

ICES, 2021b. Horse mackerel (*Trachurus trachurus*) in Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k (the Northeast Atlantic). In Report of the ICES Advisory Committee, 2021. ICES Advice 2021, hom.27.2a4a5b6a7a-ce-k8. <https://doi.org/10.17895/ices.advice.5908.>,

ICES, 2020. Mackerel (*Scomber scombrus*) in subareas 1–8 and 14, and Division 9.a (the Northeast Atlantic and adjacent waters). In Report of the ICES Advisory Committee, 2020. ICES Advice 2020, mac.27.nea. <https://doi.org/10.17895/ices.advice.5907.>,

ICES, 2021d. Plaice (*Pleuronectes platessa*) in Division 7.e (western English Channel), ICES Advice on fishing opportunities, catch, and effort Celtic Seas and Greater North Sea ecoregions Published 30 June 2021. Available at: [https://www.ices.dk/sites/pub/Publication Reports/Advice/2021/2021/ple.27.7e.pdf](https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/ple.27.7e.pdf).

ICES, 2021e. Sole (*Solea solea*) in Division 7.e (western English Channel), ICES Advice on fishing opportunities, catch, and effort Celtic Seas and Greater North Sea ecoregions Published 30 June 2021. Available at: [https://www.ices.dk/sites/pub/Publication Reports/Advice/2021/2021/sol.27.7e.pdf](https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/sol.27.7e.pdf).

Overall Performance Indicator score	100
Condition number (if relevant)	N/A

Scoring table 7. PI 2.1.2 – Primary species management strategy

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a strategy in place for the UoA for managing main and minor primary species.
	Met?	Yes	Yes	No

Rationale

In the context of this performance indicator (Source: MSC FCR v2.01; Table SA8):

- “Measures” are actions or tools in place that either explicitly manage impacts on the component or indirectly contribute to management of the component under assessment having been designed to manage impacts elsewhere.

- A “partial strategy” represents a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically.

- A “strategy” represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome, and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification of fishing practices in the light of the identification of unacceptable impacts.

As far as the operational strategy of the fishery is concerned:

- The gear and method of catching is considered a measure in that it is highly targeted with sardines making up >90% of the catch. CSMA vessels use sonar equipment to detect shoals of fish and are able to recognise the sonar signature of sardines, thus enabling a clean catch composition.
- CSMA vessels actively avoid catching non-targeted fish where they are limited by quota (e.g. herring, mackerel, horse mackerel and sprat);
- Vessels sample the catch composition prior to bringing the fish onboard to check the catch composition.

- If necessary CSMA can induce ‘slippage’ to release the catch in the net, whilst the catch is still in the water. The measure is underpinned by the CSMA slippage policy which in turn is based on EU legislation and tested outcomes for small pelagic species survival and is acceptable for secondary stocks (herring) when the CSMA slippage policy is applied (Catchpole et al. 2015; CSMA 2017b; CSMA 2020b).
- Slippage of TAC species such as mackerel, sprat and herring is permissible for the ring net fleet under the derogation within The Sea Fisheries (Amendment etc.) (No. 2) Regulations 2021 (UK 2021b) e.g. the landing obligation does not apply to this fleet for these species in the UoA area.
- An observer program has been in place since 2018 (noting it was suspended partially in 2020 for covid)
- Self-sampling and reporting under the Fisheries Science Partnership (FSP) for the past 4 years provide the CSMA with external management advice from UK national scientists (CEFAS 2020a).
- Logbook records include bycatch profile recording and slippage events. The evaluation of these show good compliance for species under this MSC component (section 6.2.3).
- There are also EU and other management measures in place for many of the retained species e.g. mackerel (quota limits and the mackerel box and bluefin tuna as described in section 6.2.4.1
- Evidence of active management by the CSMA from meeting notes and within season logbook checks on the status of the catches

There are no primary main identified for this fishery as per the evidence base presented in section 6.2.2. This is because the catch profile is dominated by the target stock to greater than 90% of the fishery. As such the ‘if necessary’ statement of the SG60 and SG80 scoring guideposts is warranted here and as such both SGs are reached **SG60 and SG80 met**.

SG100 is not met on the basis that the management strategy for the fishery has not been designed to manage primary species as required for the definition of ‘strategy’ required by the MSC.

b	Management strategy evaluation			
	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Yes	Yes	No

Rationale

There are no primary main species identified for this fishery as per the evidence base presented in section 6.2.2. This is in part because the catch profile is dominated by the target stock to >90% of the catch profile. As such the ‘if necessary’ statement identified in Sla of the SG60 and SG80 scoring guideposts is warranted here on the basis of this MSC Interpretation ([link](#)) and as such both SGs are reached **SG60 and SG80 met**.

SG100 is not met as there has been no testing of the management strategy of for the fishery for all primary species.

c	Management strategy implementation			
	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
	Met?		Yes	Yes

Rationale

There are no primary main species identified for this fishery as per the evidence base presented in section 6.2.2. This is in part because e the catch profile is dominated by the target stock to >90% of the catch profile. As such the 'if necessary' statement identified in Sla of the SG80 scoring guideposts is warranted here on the basis of this MSC Interpretation ([link](#)) and as such **SG80 is met**.

Clear evidence of the partial strategy (described in Sla) being implemented is available in the catch composition data, the observer data from the fishery and third party reports (Catchpole et al. 2015; SMRU 2018), and the CSMA active management approach (evidence in meeting notes). All of which together point to the clean nature of the fishery with respect to the catch profile relevant to this component **SG100 met**.

d	Shark finning			
	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	N/A	N/A	N/A

Rationale

There are no sharks identified in this component from the information sources presented in section 6.2.2

e	Review of alternative measures			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality

		minimise UoA-related mortality of unwanted catch of main primary species.	unwanted catch of main primary species and they are implemented as appropriate.	of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	Yes	Yes	Yes

Rationale

Unwanted catch for this fishery is resultant of undersize sardine catches, mixed shoal catches, bycatch species (non-target species such as mackerel and bluefin).

There are no main Primary species therefore **SG60 and SG80 are met by default**. With regard to SG100 and the unwanted catch of Primary minor species, there is evidence of review of measures from the 2017 slippage policy document (which has been enacted), from 2018 implementation of the observer programme, FSP feedback on catch profiles and reviews of the fishery slippage policy at the AGM and the 2020 meeting minutes (described in section 6.2.2.3) which reviews improvement to slippage management. The implementation of the CCTV on all vessels (section 6.2.2.5), some vessels adding V-cut bunt end making it easier to spill fish and other vessels adding a slip ring system at the end of the net to allow slipping from the end of the net rather than over the headline (Figure 22) are all examples of implementation of reducing unwanted catch mortality.

These formal and informal reviews appear to have occurred on a regular basis (< every 2 years) and the implementation of actions are suitable to meet the requirements of **SG100**.

References

CSMA slippage policy; CSMA logbooks; (Catchpole et al. 2015; SMRU 2018); CSMA 2020 Feb – meeting minutes; (CSMA 2020a; CSMA 2019a)

Catchpole, T., Smith, S. & Glinski, S., 2015. Assessing feasibility and developing methods for estimating survival rates of discarded (slipped) pelagic fish caught by English southwest ring-netters, CEFAS.

CEFAS, 2020a. Fisheries Science Partnership (FSP) - Sprat and Sardine self-sampling (MF079), Centre for Environment Fisheries and Aquaculture Science (CEFAS).

CSMA, 2017b. CSMA Slippage Policy, Cornish Sardine Management Association.

CSMA, 2020b. CSMA Slippage Policy, Cornish Sardine Management Association.

CSMA, 2019a. Annual General Meeting of the Cornish Sardine Management Association. July 2019, CSMA.

CSMA, 2020a. Annual General Meeting of the Cornish Sardine Management Association. July 2020, CSMA.

SMRU, 2018. Bycatch monitoring in the Cornish ringnet fishery during 2018, Sea Mammal Research Unit, Scottish Oceans Institute, St. Andrews University, Scotland.

SMRU, 2022. Bycatch Monitoring in the Cornish Ring Net Fishery during 2020 and 2021, Sea Mammal Research Unit, Scottish Oceans Institute, St. Andrews University, Scotland.

UK, 2021b. The Sea Fisheries (Amendment etc.) (No. 2) Regulations 2021, UK Government. Available at: <https://www.legislation.gov.uk/uksi/2021/1429/made>.

Overall Performance Indicator score	90
Condition number (if relevant)	N/A

Scoring table 8. PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.
	Met?	Yes	Yes	No

Rationale

The information available for consideration under this component are:

1. Logbook records from the CSMA fleet – including landings of primary species and slippage events - Logbook compliance for the fleet for primary species is complete for 10 of the 12 vessels (Table 20);

2. Processor landing data with landed bycatch weights;
3. Observer records of catch profiles (4 years);
4. Fisheries Science Partnership (FSP) program data – self reporting with external verification during the course of the program.

Qualitative and quantitative information (completed logbooks by the majority of the fleet (section 6.2.2)) are available on primary species and summary statistics produced by the CSMA statistician on an annual basis along with the FSP project (CEFAS 2020a), which enables the assessment team to determine that there are no main Primary species.

The FSP study suggested that discarding was low: only 3 discarding events were reported by two skippers during the peak of the fishing season, with the overall discard volume for the fishing season estimated to be less than 2 tonnes. The study also reported that slippage was of low frequency not exceeding once a month per vessel, totalling > 5% of catch (Carpi & Kooij 2018). This discard rate has remained similar in 2019 and 2020 (Table 18) with sardine (target stock) being the majority catch.

Observer records highlight the clean nature of the catch composition providing third party independent verification of the catch profiles. The data is adequate to assess that the UoA has no impact on main primary species and in the absence of main secondary species the status requirement of the SGs becomes not applicable.

SG60 and SG80 is therefore met.

However, the FSP data included only seven of the fleet. The CSMA log-sheets are not independently verified, although they are checked by the CSMA themselves there remains issues in the reporting from some vessels (as highlighted in some of the CSMA meetings). Further, it is noted that it is difficult to estimate the quantity of fish slipped from the net and skippers cannot always indicate which species they have slipped. **SG100 not met.**

b	Information adequacy for assessment of impact on minor primary species	
	Guide post	Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?	Yes

Rationale

The individual status of Primary minor stocks, with respect to PRI, are shown in PI2.1.1b and for all stocks it is possible to estimate the UoA impact against the stock size. An example of this is shown for horse mackerel in PI 1.1.2b. In all respects the quantity of the catches of the UoA are low compared to the stock sizes and **SG100 is met.**

c	Information adequacy for management strategy
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	Guide post	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Yes	Yes	No

Rationale

There are no main primary species (PI2.1.1 based on the evidence in section 4.2.4) nonetheless the information base is adequate to support measures for these species if required and a number of measures described in PI2.1.2a which would constitute a partial strategy for this component. Further, the information base presented in 2.1.3 Sla shows that should a main primary species be identified, the information collecting capacity of the UoA is adequate to detect this. **SG60 and SG80 are met**. As there is no management system in place suitable to described as a 'strategy' in relation to all primary species **SG100 cannot be met**.

References

CSMA logbooks; CSMA 2020 Feb – meeting minutes (CSMA 2020a; CSMA 2019a);

Carpi, P. & Kooij, J.V. der, 2018. SARDINE (SARDINA PILCHARDUS) IN ICES SUBAREA VII - summary of results, CEFAS.

Catchpole, T., Smith, S. & Glinski, S., 2015. Assessing feasibility and developing methods for estimating survival rates of discarded (slipped) pelagic fish caught by English southwest ring-netters, CEFAS.

CEFAS, 2020a. Fisheries Science Partnership (FSP) - Sprat and Sardine self-sampling (MF079), Centre for Environment Fisheries and Aquaculture Science (CEFAS).

CSMA, 2017b. CSMA Slippage Policy, Cornish Sardine Management Association.

CSMA, 2020b. CSMA Slippage Policy, Cornish Sardine Management Association.

CSMA, 2019a. Annual General Meeting of the Cornish Sardine Management Association. July 2019, CSMA.

CSMA, 2020a. Annual General Meeting of the Cornish Sardine Management Association. July 2020, CSMA.

SMRU, 2018. Bycatch monitoring in the Cornish ringnet fishery during 2018, Sea Mammal Research Unit, Scottish Oceans Institute, St. Andrews University, Scotland.

SMRU, 2019. Bycatch monitoring in the Cornish ringnet fishery during 2018, Sea Mammal Research Unit, Scottish Oceans Institute, St. Andrews University, Scotland.

SMRU, 2022. Bycatch Monitoring in the Cornish Ring Net Fishery during 2020 and 2021, Sea Mammal Research Unit, Scottish Oceans Institute, St. Andrews University, Scotland.

Overall Performance Indicator score	85
Condition number (if relevant)	N/A

Scoring table 9. PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guide post	Main secondary species are likely to be above biologically based limits. OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are highly likely to be above biologically based limits. OR If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main secondary species are above biologically based limits.
	Met?	N/A	N/A	N/A

Rationale

Based on the evidence presented in section 6.2.2, there is strong evidence that no main secondary species are caught by this fishery (no species with percentage composition >5% , no less - resilient stocks) and therefore this [MSC interpretation applies](#) and the team determines that the UoA has no impact on this particular SI, **N/A**

b	Minor secondary species stock status	
	Guide post	Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?	No

Rationale

The individual Secondary minor scoring elements identified in Table 15 and Table 16, have not been scored as part of this assessment. The assessment team took the all or nothing approach as per [MSC interpretation](#) and **SG100 is not met**

References

section 6.2.2.

Table 15 and Table 16.

CSMA logbook records

SMRU observer report records:

SMRU, 2019. Bycatch monitoring in the Cornish ringnet fishery during 2019, Sea Mammal Research Unit, Scottish Oceans Institute, St. Andrews University, Scotland.

SMRU, 2022. Bycatch Monitoring in the Cornish Ring Net Fishery during 2020 and 2021, Sea Mammal Research Unit, Scottish Oceans Institute, St. Andrews University, Scotland.

SMRU, 2018. Bycatch monitoring in the Cornish ringnet fishery during 2018, Sea Mammal Research Unit, Scottish Oceans Institute, St. Andrews University, Scotland.

Overall Performance Indicator score	80
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Condition number (if relevant)	N/A
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Scoring table 10. PI 2.2.2 – Secondary species management strategy

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue	SG 60	SG 80	SG 100	
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a strategy in place for the UoA for managing main and minor secondary species.
	Met?	Yes	Yes	No

Rationale

In the context of this performance indicator (Source: MSC FCR v2.01; Table SA8):

- “Measures” are actions or tools in place that either explicitly manage impacts on the component or indirectly contribute to management of the component under assessment having been designed to manage impacts elsewhere.
- A “partial strategy” represents a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically.
- A “strategy” represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome, and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts.

As far as the operational strategy of the fishery is concerned:

- The fishery is highly targeted with sardines making up >90% of the catch on average. CSMA vessels use sonar equipment to detect shoals of fish and are able to recognise the sonar signature of sardines, thus enabling a clean catch composition;
- CSMA vessels actively avoid catching non-targeted fish where they are limited by quota (e.g. sprat);

- Vessels sample the catch composition prior to bringing the fish onboard to check the catch composition;
- If necessary CSMA can induce ‘slippage’ to release the catch in the net, when the target catch (sampled by brailing) is still in the water. The measure is underpinned by the CSMA slippage policy which in turn is based on EU legislation and tested outcomes for small pelagic species survival and is acceptable for secondary stocks (herring) when the CSMA slippage policy is applied (Catchpole et al. 2015; CSMA 2017b);
- As of 2021, the CCTV system is in place and can be used to verify slippage events (see protocol in section 6.2.2.5);
- An observer program is in place for 4 years (noting it was suspended in early 2020 for covid, but restarted by summer 2020)
- Self-sampling and reporting under the Fisheries Science Partnership (FSP) for the past 4 years providing the CSMA with external management advice;
- Logbook records which include bycatch profiles and the evaluation of these show good compliance for species under this component (section 6.2.3);
- Evidence of active management by the CSMA from meeting notes and within season logbook checks on the status of the catches.

There are no secondary main species identified for this fishery as per the evidence base presented in section 6.2.2. This is because the catch profile is dominated by the target stock to greater than 90% of the fishery. As such the ‘if necessary’ statement of the SG60 and SG80 scoring guideposts is warranted here and as such both SGs are reached **SG60 and SG80 met**.

SG100 is not met on the basis that the management strategy for the fishery has not been designed to manage secondary species as required for the definition of ‘strategy’ required by the MSC.

b	Management strategy evaluation			
	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	Yes	Yes	No

Rationale

There are no secondary main species identified for this fishery as per the evidence base presented in section 6.2.2. This is in part because the catch profile is dominated by the target stock to >90% of the catch profile. As such the ‘if necessary’ statement identified in Sla of the SG60 and SG80 scoring guideposts is warranted here on the basis of this MSC Interpretation ([link](#)) and as such both SGs are reached **SG60 and SG80 met**.

SG100 is not met as there has been no testing of the management strategy of for the fishery relevant to this component.

c	Management strategy implementation
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	Guide post	There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	Met?	Yes	Yes

Rationale

There are no secondary main species identified for this fishery as per the evidence base presented in section 6.2.2. This is in part because the catch profile (quantitative evidence) is dominated by the target stock to >90% of the catch profile. As such the 'if necessary' statement identified in Sla of the SG80 scoring guideposts is warranted here on the basis of this MSC Interpretation ([link](#)) and as such **SG80 is met**.

Clear evidence of the partial strategy (described in Sla) being implemented is available in the catch composition data, the observer data from the fishery and third party reports (Catchpole et al. 2015; SMRU 2018), and the CSMA active management approach (meeting notes). All of which together point to the clean nature of the fishery with respect to the catch profile relevant to this component **SG100 met**.

d	Shark finning			
	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA

Rationale

There are no sharks identified in this component from the information sources presented in section 6.2.2

e	Review of alternative measures to minimise mortality of unwanted catch			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.

	Met?	Yes	Yes	Yes
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Rationale

Unwanted catch for this fishery is resultant of undersize sardine catches, mixed shoal catches, bycatch species (non-target species such as sunfish and herring).

There are no main secondary species therefore **SG60 and SG80 are met by default**. With regard to SG100 and the unwanted catch of secondary minor species, there is evidence of review of measures from the 2017 slippage policy document (which has been enacted), 2018 implementation of the observer program, FSP feedback on catch profiles and reviews of the fishery slippage policy at the AGM and the 2020 meeting minutes (described in section 6.2.2.3) which reviews improvements to slippage management. The implementation of the CCTV on all vessels (section 6.2.2.5), some vessels adding V-cut bunt end making easier to spill fish and other vessels adding a slip ring system at the end of the net to allow slipping from the end of the net rather than over the headline (Figure 22) are all examples of implementation of reducing unwanted catch mortality.

These formal and informal reviews appear to have occurred on a regular basis (< every 2 years) and the implementation of actions are suitable to meet the requirements of **SG100**.

References

CSMA logbooks;

CSMA 2020 Feb – meeting minutes;

Catchpole, T., Smith, S. & Glinski, S., 2015. Assessing feasibility and developing methods for estimating survival rates of discarded (slipped) pelagic fish caught by English southwest ring-netters, CEFAS.

CSMA, 2017b. CSMA Slippage Policy, Cornish Sardine Management Association.

CSMA, 2020b. CSMA Slippage Policy, Cornish Sardine Management Association.

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SMRU, 2022. Bycatch Monitoring in the Cornish Ring Net Fishery during 2020 and 2021, Sea Mammal Research Unit, Scottish Oceans Institute, St. Andrews University, Scotland.

Overall Performance Indicator score	90
Condition number (if relevant)	N/A

Scoring table 11. PI 2.2.3 – Secondary species information

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue	SG 60	SG 80	SG 100	
a	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.
	Met?	Yes	Yes	No

Rationale

The information available for consideration under this component are:

1. Logbook records from the CSMA fleet – including landings of secondary species and slippage events - Logbook compliance for the fleet for secondary species is reasonably complete for this component (Table 20);
2. Observer records of catch profiles (4 years) confirm the clean nature of the catches and the low occurrence of secondary species;
3. Fisheries Science Partnership (FSP) program data – self reporting with external verification during the course of the program.

Qualitative and quantitative information (completed logbooks by the majority of the fleet (section 6.2.2) are available on secondary species and summary statistics produced by the CSMA statistician on an annual basis along with the FSP project (CEFAS 2020a). Which enables the assessment team to determine that there are no main secondary species.

The FSP study suggested that discarding was low: only 3 discarding events were reported by two skippers during the peak of the fishing season, with the overall discard volume for the fishing season estimated to be less than 2 tonnes. The study also reported that slippage was of low frequency not exceeding once a month per vessel, totalling > 5% of catch (Carpi & Kooij 2018).

Observer records highlight the clean nature of the catch composition providing third party independent verification of the catch profiles.

The data is adequate to assess that the UoA has no impact on main secondary species and in the absence of main secondary species the status requirement of the SGs becomes not applicable.

SG60 and SG80 is therefore met.

However, the FSP data included only seven of the fleet. The CSMA log-sheets are not independently verified, although they are checked by the CSMA themselves there remains issues in the reporting from some vessels. Further, it is noted that it is difficult to estimate the quantity of fish slipped from the net and skippers cannot always indicate all the species they have slipped. **SG100 not met.**

b	Information adequacy for assessment of impacts on minor secondary species		
	Guide post		Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?		No

Rationale

The individual status of secondary minor stocks has not been assessed and as such even with the accuracy of the data sources in Sla **SG100 cannot be said to be met.**

c	Information adequacy for management strategy			
	Guide post	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .
	Met?	Yes	Yes	No

Rationale

There are no main secondary species (PI2.2.1 based on the evidence in section 4.2.4) nonetheless the information base is adequate to support measures for these species if required and a number of measures described in PI2.1.2a, which would constitute a partial strategy for this component. Further, the information base presented in 2.1.3 Sla

shows that should a main secondary species be identified the information collecting capacity of the UoA is adequate to detect this. **SG60 and SG80 are met.** As there is no management system in place suitable to described as a ‘strategy’ in relation to secondary species **SG100 cannot be met.**

References

CSMA logbooks;

CSMA 2020 Feb – meeting minutes;

Catchpole, T., Smith, S. & Glinski, S., 2015. Assessing feasibility and developing methods for estimating survival rates of discarded (slipped) pelagic fish caught by English southwest ring-netters, CEFAS.

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CSMA, 2020b. CSMA Slippage Policy, Cornish Sardine Management Association.

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SMRU, 2019. Bycatch monitoring in the Cornish ringnet fishery during 2018, Sea Mammal Research Unit, Scottish Oceans Institute, St. Andrews University, Scotland.

SMRU, 2022. Bycatch Monitoring in the Cornish Ring Net Fishery during 2020 and 2021, Sea Mammal Research Unit, Scottish Oceans Institute, St. Andrews University, Scotland.

Overall Performance Indicator score	80
Condition number (if relevant)	N/A

Scoring table 12. PI 2.3.1 – ETP species outcome

PI 2.3.1	The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue	SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable		
Guide post	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/ stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population /stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
Met?	Harbour porpoise - Yes Common dolphin - Yes	Harbour porpoise - Yes Common dolphin - Yes	No both elements

Rationale

In order to assess the effects of the fishery on ETP species, a list of potential ETP species in the area were collated by reviewing the relevant national and international legislation and species distributions (see section 6.2.5). Potential ETP species were summarised in section 6.2.5.1 and cross-referenced against the information from the fishery and those considered likely to have overlap with the fishery. Those that include limits are:

The only two species that are subject to national or international limits are harbour porpoise and common dolphins, which have interactions with the fishery. In both cases, these limits arise from the Agreement on the Conservation of Small Cetaceans of the Baltic, North-East Atlantic, Irish and North Seas (ASCOBANS) that was signed in 1992 and which has been in force since 1994 (United Nations 1992). The UK is a party to ASCOBANS (ASCOBANS 2000; ASCOBANS 2020) and at the 3rd Meeting of Parties in 2000 it was agreed that the total anthropogenic removals from small cetacean populations should be no more than 1.7% of the best available estimate of abundance (ASCOBANS 2020). This value represents the international limit for both species.

Harbour porpoise population size:

The most recent estimate is 35,232 for the Celtic and Irish seas population (NAMMCO 2019). 1.7% = 599

The total catch by all métiers in the Celtic and Irish Sea management unit was estimated at 879 individuals p.a. The report only considers UK catches, and does not consider fishery removals by other nationalities in this area (Northridge et al. 2018).

Common dolphin, population size:

The most recent estimate is 468,000 for the NE Atlantic population (Hammond et al. 2017). 1.7% = 7,956

ICES (ICES 2016) evaluated that the annual bycatch within the North Sea (including the Skagerrak and Eastern Channel) was at 0.88% and in the Kattegat and Belt Seas is at 0.55%. Both figures are below the limit considered to be unsustainable (1.7%) but ICES states that unknown amounts of bias exist in the assessments.

UoA impacts:

There are no observer reports of interaction with either of these species. This is likely because the events are rare, and the observer coverage is not sufficiently high or temporally long enough to have captured these. Nonetheless the observer trips in 2018 did report observations of common dolphin and active avoidance of the skipper in shooting the net with them present. Interactions and release status are recorded in vessel logbooks (table below). In 2019, one of the recorded interactions with common dolphins was reported by a member of the public to the management authorities which investigated the incidence. At audit that year, the MMO confirmed the vessel had released the dolphins by dipping the headline and the incident could be cross referenced against the logbook data.

Species	2017	2018	2019	2020	total
Common dolphin <i>(Delphinus delphis)</i>	1 (fate unknown)	7 6 alive 1 unknown fate	5 (released alive) 19 observed near vessels	2 (released alive)	15
Harbour porpoise <i>(Phocoena phocoena)</i>	0	0		3 (released alive)	3

Outcome

To meet SG60 there must be evidence that the requirements for protection and rebuilding are being achieved. The ASCOBANS limit is (1.7% = 599 for harbour porpoise, 1.7% = 7,956 for common dolphin) and UoA impact must be within this. Of all the recorded encounters only two (2017 and 2018 common dolphin represent mortality events) which would impact the definition of protection and rebuilding. However, against the requirements for protection and rebuilding by the ASCOBAN limit shown for these species the value is negligible. **SG60 is met for all elements.**

To meet the SG80 requirement that the impact is “highly likely” to be within the ASCOBANS limit, it is necessary to demonstrate that the upper 80th percentile confidence interval is below the limit value for all UoAs in the MSC program. For the common dolphin analysis by ICES concluded that *“The total common dolphin bycatch [by all vessels] in the southern part of the Celtic Seas ecoregion and in the Bay of Biscay in 2016 was likely to have been 153–1607 individuals in mid-water trawls, and 904–4355 individuals in nets. Combined, these figures represent approximately 0.5% and 1.6% of the common dolphins present in the two areas.”* (ICES 2019a). Analysis of the MSC assessments currently available through the MSC website show the following bycatch for other UoAs where these species are considered ETP under version 2.0 of the MSC standard.

Common dolphin

- a) FROM Nord North Sea and Eastern Channel pelagic trawl herring – the most recent re-assessment report for this fishery (April 2020) stated that observers aboard UoA vessels had not recorded any interactions with cetaceans.
- b) Germany North Sea Saithe – the most recent re-assessment report (October 2018) and most recent surveillance report for this fishery (April 2020) reports that observers aboard UoA vessels have not recorded any common dolphin mortality.
- c) Joint Demersal Fisheries in the North Sea: the Public Certification Report for this fishery (October 2019) reports no interactions with common dolphins. This finding was confirmed in the assessment team’s written response to a stakeholder query on this specific issue (page 394 of the report).
- d) Northern Ireland Pelagic Sustainability Group (NIPSG) Irish Sea herring – the most recent assessment report for this fishery (November 2019) reports that no interactions with cetaceans are reported for this fishery.
- e) Schleswig-Holstein blue shell mussel – both the public certification report for this fishery (October 2016) and the most recent surveillance report (August 2020) confirm that this fishery has no impact on cetaceans.
- f) SFSAG northern demersal fishery – Under assessment ACDR report no common dolphin interaction in the latest observer data.
- g) Cornish hake fishery –for common dolphin report 44 individuals per year or <0.01% of the population estimate for the UK hake gill net métier.

Harbour porpoise (Celtic and Irish Sea management unit)

- a) Northern Ireland Pelagic Sustainability Group (NIPSG) Irish Sea herring – the most recent assessment report for this fishery (November 2019) reports that no interactions with cetaceans are reported for this fishery.
- b) SFSAG northern demersal fishery – Under assessment ACDR report two harbour porpoise interaction in the latest observer data.
- c) Cornish hake fishery – for harbour porpoise report 14 individuals per year or 0.04% of the population.

In summary, the recorded impacts of MSC-certified fisheries on the NE Atlantic common dolphin and harbour porpoise stock are limited to this fishery the Cornwall hake fishery (<0.5% of the population estimate for both stocks) and the SFSAG northern demersal fishery, the combined effect are within the limits of ASCOBAN requirement **the SG80 requirements are therefore fully met for all elements.**

To meet the **SG100 requirements** it is necessary to demonstrate with a “high degree of certainty” that the cumulative impacts of MSC UoAs are within limits for the species (as opposed to the stock). This information is not available, **so this requirement is not met.**

b	Direct effects			
	Guide post	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Yes - all elements	Yes - all elements	No - all elements

Rationale

In order to assess the effects of the fishery on ETP species, a list of potential ETP species in the area were collated by reviewing the relevant national and international legislation and species distributions (see section 6.2.5). Potential ETP species were summarised in section 6.2.5.1 and cross-referenced against the information from the fishery and those considered likely to have overlap with the fishery. Those species applicable to this SI are:

- Common seal (*Phoca vitulina*)
- Grey seals (*Halichoerus grypus*)
- Seabird species (see Table 26)

The cross-referencing of these species against the logbook data and observer reports ((SMRU 2018) and (SMRU 2019)) shows that only the following have any recorded interaction with the fishery: Black back gull (*Larus marinus*), herring gulls (*Larus argentatus*) and grey seal (*Halichoerus grypus*). There are 15 reported bird encounters from the logbooks, which cannot be attributed to species, 11 of which are for 'gull' which likely places them under either herring or black back gull (see table below). There are logbook mortality events reported for herring gull (2018) but all other encounters appear to show the animal released alive. The observer data from 2018 and 2019 (27 trips total) show a single herring gull mortality but also highlights that encounter with the gulls do occur. The observer summary report notes that all birds (except the 1 mortality) were released alive with three dried out on the vessel prior to release (SMRU 2018). As reported in the previous assessment for this fishery seal interactions are the result of seals entering the net over the headline to feed on fish but then leave the net by jumping over the headline. They have sufficient time to do this as the net is slowly brought in and the catch brailed or vacuumed into the vessel (Cieri et al. 2017). This same interaction is reported in the 2019 and 2020 encounters recorded in the logbooks.

Species	2017	2018	2019	2020	total	Population status
Black back gull <i>(Larus marinus)</i>	0	0	0	2 (released alive)	2	237,000-266,000 mature individuals (link), 15,000 Pairs in the UK in 2015 (link)
Herring gulls <i>(Larus argentatus)</i>	0	53 28 dead (single event) all others alive.	0	0	53	UK population 139,200 Apparently Occupied Nests (AON) (link)
Gull (unspecified)	0	0	0	11 (released alive)	11	Likely either Black back gull <i>(Larus marinus)</i> Herring gulls <i>(Larus argentatus)</i>
Bird unknown				4 (released alive)	4	Not available
Seal <i>(Halichoerus grypus)</i>	0	0	2 (released alive)	2 (released alive)	4	The latest UK population figures estimate that the population is 150,000 (approximate 95% CI 131,000-171,600) grey seals (1+ aged population) in 2017 (SMRU 2018). Low numbers in the Western channel with the most significant concentrations in Orkney and around the Hebrides with 90% of the UK population of the population are in Scotland .

Outcome.

Direct effects on the ETP identified are considered to be: drowning, entanglement, physical injury and as well as the possibility of ‘ghost fishing’ from lost nets.

Regarding mortality the UoA impact shown in the table above highlights the low level of impact the UoA has on the populations of ETP species considered in this SI. Of all the recorded encounters only mortality events with herring gulls are reported and the number of these versus the population status show this impact to be negligible. There is the possibility of injury to birds and seals through interaction with the fishing gear but again the low level of interaction against the population status show this impact to be negligible against the requirement of not hindering recovery of these species. Finally, net loss is occasionally reported in the fishery (Jones et al. 2020) section 6.2.2.3 but best efforts are made to recover the nets (they cost £80,000 each so there is a strong interest to recover them) and therefore this direct effect is low. Based on this evidence the assessment team consider **SG60 and SG80 met for all elements.**

SG100 is not met for the following reasons: 1. The logbook data for all vessels is not complete for ETP interactions. As shown in section 6.2.3 despite the low levels of occurrence this is a data limitation. 2. Not all interactions are recorded to species level, as evidenced by the Gull (unspecified) and Bird unknown records. 3. Observer data whilst confirming the low occurrence of ETP interaction is not of sufficient coverage (two years only, and small percentage of trips) to provide ‘a high degree of confidence’ for rare ETP occurrences.

c	Indirect effects		
	Guide post	Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species.
	Met?	Yes	No

Rationale

The direct effects of the UoA on ETP species may arise from entanglement in fishing nets and from ghost fishing by any lost nets and are considered in SIa and SIb above. Indirect effects may arise from the removal of potential prey species by the UoA that may cause low food availability for ETP species.

Given that the UoA has a limited spatial footprint and is concentrated on the sardine stock which is shown to be in good health and is only fished by the UoA to ~<10% of the SSB the UoA is highly unlikely to remove sufficient biomass to impact prey items. Indeed most interactions with gulls and seals appear to provide a feeding opportunity for these species and therefore may actually benefit some individuals. In addition to sardine, the coastal waters of the UK also have populations of mackerel, sprat, herring, and anchovy (as evidenced in the bycatch profile of this fishery) which would also form prey items for coastal marine mammals (seals, common dolphin and harbour porpoise) and some seabirds. The low take of these bycatch species (no main Primary or Secondary species) suggest the UoA would not create unacceptable impacts for ETPs. **SG80 is met.**

With regard to SG100 a high degree of confidence could only be given if there was as available work describing the feeding regimes and energetics of all ETP species in the area. This is not available (to the knowledge of the assessment team) and therefore **SG100 is not met.**

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Overall Performance Indicator score	80
Condition number (if relevant)	N/A

Scoring table 13. PI 2.3.2 – ETP species management strategy

PI 2.3.2	The UoA has in place precautionary management strategies designed to: meet national and international requirements; ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)		
Guide post	There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA’s impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA’s impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
Met?	Yes	Yes	No

Rationale

In the context of this performance indicator (Source: MSC FCR v2.01; Table SA8):

- “Measures” are actions or tools in place that either explicitly manage impacts on the component or indirectly contribute to management of the component under assessment having been designed to manage impacts elsewhere.
- A “strategy” represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome, and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts.
- A “comprehensive strategy” is a complete and tested strategy made up of linked monitoring, analyses, and management measures and responses.

With respect to scoring this SI the team referred to MSC clause SA3.11.1 - When scoring the ETP Management Strategy PI SGs teams shall consider the need to minimise mortality.

Measures in place

- ASCOBANS (Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas), which aims to restore and/or maintain biological or management stocks of small cetaceans at the level they would reach if there is the lowest possible anthropogenic influence. ASCOBANS aims to reach these levels through coordinating and implementing conservation measures. ASCOBAN regulation on harbour porpoise and common dolphin includes bycatch limits of 1.7% total across all fisheries;
- The EU Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora) which requires the UK to protect all cetaceans and a number of pinnipeds including the following species of relevance to this fishery: grey seal (*Halichoerus grypus*); common seal (*Phoca vitulina*); harbour porpoise (*Phocoena phocoena*) and any other marine mammal encountered. The EU habitats directive is now in UK national legislation as The Conservation of Habitats and Species Regulation 2017 (UK 2017) and its (Amendment) (EU Exit) Regulations 2019 (UK 2019);
- The EC Regulation 821/2004 laying down measure concerning the incidental catch of cetaceans obliges the use of deterrents (e.g. pingers) and monitoring by observers of incidental catches in specific fisheries. The Cornish sardine ring-net fishery is not required under the EU regulation to use deterrents or to have observer coverage as the impact of this fishing gear on cetaceans is deemed to be low, however observers have been present in 2018 and 2019 and will be returning in 2021 following the postponement of the program in 2020 due to covid;
- A UK licence condition for the fishery effective from mid-2021 requires the reporting of marine mammal bycatch to comply with international standards for the conservation of marine mammals. Under this condition there is now a mandatory requirement, whereby fishers need to report any bycatch of marine mammals to the MMO, via a template within 48 hours of the end of the fishing trip.
- Seabirds are protected under the EU Birds Directive (Council Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds) (now The Conservation of Habitats and Species Regulation UK (2017; 2019) including the following species that are of relevance to this fishery: lesser black-backed gulls (*Larus fuscus*); great black backed gull (*Larus marinus*) and herring Gull (*Larus argentatus*);
- The UK Wildlife & Countryside Act - The Act prohibits and limits actions involving wild animals and is the primary piece of legislation for wildlife protection in the UK. Prohibitions include taking, injuring, killing and disturbing. It is also an offence to disturb places used for shelter and protection. Under the legislation it is illegal to disturb any dolphin or whale intentionally or recklessly 9(4A) or sell, offer or expose for sale any cetacean, 9(5). It is illegal to intentionally or recklessly disturb any nesting site or activity of seabirds listed in the Act;
- CIFCA has a code of conduct to avoid the incidental capture of cetaceans. This code requests all fishermen setting nets around the coastline of Cornwall to avoid setting nets in the vicinity of observed or reported concentrations of cetaceans, inform other fishermen of any observations and set nets at times to minimise interactions. It also asks fishermen to officially record any cetacean interactions (CIFCA 2005). CSMA members follow this code and record any cetacean interactions in their logbooks (section 6.2.2.1);
- CSMA slippage policy (appendix 11 - CSMA slippage policy 2020). Includes links to techniques which can be used to mitigate marine mammal encounters, including backdown procedures <https://www.bmis-bycatch.org/mitigation-techniques/backdown-procedure-and-medina-panel>. If a marine mammal was

caught within the net and was unable to leave. This backdown procedure allows the headline of the net to be pulled below the water, allowing catch to spill-out over the headline and out of the net. These procedures have been developed with input from SMRU (SMRU 2022).

- CSMA has an operational strategy of deterring birds by banging chains on the side of the boat as the net is pulled in and the catch brailed, in order to avoid any damage to the net;
- CSMA regularly review there procedures through meetings and adopt new measures strategies as required. Reviews of the fishery slippage policy at the AGM and the 2020 meeting minutes (described in section 6.2.2.3) which reviews improvement to slippage management;
- The fishery is principally an overnight fishery, although a minor number of shots are completed in daylight hours and there is no regulation preventing this. As such seabird interaction is reduced, as few seabirds hunt at sea after dark;
- As of 2021 the CCTV system is in place and can be used to verify any ETP interaction events (see protocol in section 6.2.2.5);
- The CSMA has issued skippers with a generic cetacean identification guide which covers the likely interacting species (and others) to ensure that correct identification is assigned (Figure 29);

It is therefore considered that there is a strategy as defined by MSC in place to minimise mortality to ETP species and the fishery is therefore **SG60 and SG80 are met** for this scoring issue. **The fishery is not awarded SG100** as these measures are not considered to be a comprehensive strategy specific to this fishery to manage impacts on ETP species which has been tested.

b	Management strategy in place (alternative)			
	Guide post	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	NA	NA	N/A

Rationale

The terms “measures” and “strategy” and “comprehensive strategy” used in this SI are defined in the MSC Fisheries Certification Requirements v 2.01 (see the MSC Standard text reproduced in the rationale for PI 2.1.2 SIa and 2.3.2 SIa).

This SI applies to ETP species for which there are no national and international requirements for protection. All of the ETP species impacted by this UoA are subject to requirements for protection and rebuilding and have therefore been assessed under SIa above.

c	Management strategy evaluation
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	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Yes	Yes	No

Rationale

With respect to scoring this SI the team referred to MSC clause SA3.11.1 - When scoring the ETP Management Strategy PI SGs teams shall consider the need to minimise mortality.

Evidence that the measures/strategy are working come from:

1. The logbook records of the fishery where dedicated reporting areas are provided for recording of interactions and logbooks reviewed in this audit show that there is a level of compliance with this by the fishery (sections 6.2.2.1 and 6.2.3) and that very few interactions occur;
2. Two years of observer data, albeit at low levels, but with zero mortality, confirm the rare nature of interaction with marine mammals;
3. UK national reporting of observer trips covering the UoA confirm the low risk over multiple years. * up until the UK left the EU in 2020 it had a requirement to submit annual UK monitoring obligations under Council Regulation 812/2004 and the Common Fisheries Policy's new Technical Conservation Regulation. This annual report included the UoA data. Iterations from 2011, 2015 included the UoA (as reported in Cieri et al. (2017)) whilst the 2018 data is included in the 2018 issue of the report (Northridge et al. 2018) (Table A1), included 9 trips, 5 vessels, resulting in no cetacean bycatch, with 6 seabird interactions all released alive;
4. Management authorities (EU, MMO and CIFCA) confirming that risk of mortality from the fishery is low – as per these organisational opinions given in previous audits (Jones et al. 2018; Jones et al. 2019; Jones et al. 2020);
5. Stakeholders in the fishery confirmed, similar to the last reassessment (Cieri et al. 2017)- *the ring-net fishery is not considered to be high-risk for sea mammal interaction by the UK Sea Mammal Research Unit UK (Personal communications, Simon Northridge, Sea Mammal Research Unit, 22 October 2015) and RSPB are not aware that this fishery poses a problem for seabird bycatch (Personal Communications, Paul St Pierre, RSPB, 13th October, 2015);*
6. The backdown technique (guided in the slippage policy of the fishery) is a known effective method from other purse seine fisheries 'The 'backdown procedure' has greatly contributed to the reduction of bycatch of small cetaceans in purse seine fisheries in the eastern tropical Pacific and is widely used in that region's tuna fishery' cited in <https://www.bmis-bycatch.org/mitigation-techniques/backdown-procedure-and-medina-panel>;

On the basis of the above **SG60 and SG80 can be met.**

SG100 is not met because not all members of the CSMA completing logbooks as required by the association rules Section 6.2.3 and CSMA do not seem to have been able to resolve this ongoing issue. Quantitative data from the entire fleet is missing for this component.

d	Management strategy implementation		
Guide post		There is some evidence that the measures/strategy is being implemented successfully.	There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
Met?		Yes	No

Rationale

With respect to scoring this SI the team referred to MSC clause SA3.11.1 - When scoring the ETP Management Strategy PI SGs teams shall consider the need to minimise mortality.

Some evidence of successful implementation can be found in the logbook compliance for recording ETP interactions (Sections 6.2.2.1 and 6.2.3), the implementation of the observer program (noting the 2020 hiatus due to covid) and the new CCTV measures for 2021. Further evidence of vessel actions can be found from the interaction with three dolphins with a CSMA member vessel, which was recorded on camera from the shore by members of the public and report in 2020 (Jones et al. 2020). The vessel skipper employed the backdown technique (using bow thrusters) to lower the headline of the net and release the dolphins. The interaction was reported to the MMO and correctly recorded in the vessel logbook. On this basis **SG80 is met**.

For SG100 there is no clear evidence of the strategy being implemented successfully as not all members of the CSMA completing logbooks as required by the association rules Section 6.2.3 and CSMA continue to try to resolve this ongoing issue. **SG100 is not met**.

e	Review of alternative measures to minimize mortality of ETP species		
Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
Met?	Yes	Yes	Yes

Rationale

With respect to scoring this SI the team referred to MSC clause SA3.11.1 - When scoring the ETP Management Strategy PI SGs teams shall consider the need to minimise mortality.

There is evidence of review of measures from the 2019 slippage policy document, which included techniques which can be used to mitigate marine mammal encounters, these include backdown procedures and the use of medina panels (<https://www.bmis-bycatch.org/mitigation-techniques/backdown-procedure-and-medina-panel>). The introduction of the observer program in 2018 was the result of stakeholder feedback and active management by the fishery. Logbook amendments (to include ETP species types) have been enacted since the last certification cycle and there continues to be active dialogue on improving bycatch rates as evidenced in the 2020 meeting minutes (described in section 6.2.2.3) which reviews improvement to slippage management. Finally, in 2021 all vessels will now carry CCTV cameras to document operations in the fishery. Taken as whole these reviews and the implementation of measures in the past few years are more frequent than every 2 years and **are suitable to meet the requirements of SG60, SG80 and SG100.**

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Overall Performance Indicator score	85
Condition number (if relevant)	N/A

Scoring table 14. PI 2.3.3 – ETP species information

PI 2.3.3	Relevant information is collected to support the management of UoA impacts on ETP species, including: Information for the development of the management strategy; Information to assess the effectiveness of the management strategy; and Information to determine the outcome status of ETP species		
Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts		
Guide post	Qualitative information is adequate to estimate the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.
Met?	Yes	Yes	No

Rationale

The information available for consideration under this component are:

- Logbook records from the CSMA fleet – including ETP interactions - Logbook compliance for the fleet for ETP species is not complete with 5 of the 12 active vessels not fully completing this section of the CSMA logbooks (Table 20). However, records include comments on interaction types and fate where recorded and the numbers are low;
- Observer records of catch profiles (4 years) (SMRU 2018) (SMRU 2019) (SMRU 2022) which shows limited ETP interaction to identified seagull species and a low mortality rate against the population sizes;

- PELTIC survey data – there is annual monitoring of cetacean and seabird numbers which overlap with the UoA footprint (section 6.2.7.3);
- Population estimates for all ETP elements e.g. (NAMMCO 2019), (Hammond et al. 2017) and references listed in Table 22 and Table 23 and Table 24, which can be cross referenced against the UoA catches

Based on the above information, there is qualitative evidence and some quantitative information available on the catch rate of ETP by the UoA, which enables a numerical estimate of mortality, and which can be cross-checked against the UoA observer program. There is also information available about the population abundance for all ETP elements considered for the UoA. The combination of both the mortality estimate and the population data allows the impact of the UoA on the species to be assessed. **SG60 and SG80 are met.**

SG100 is not met on the basis of the five vessels failure to record ETP interaction limits the adequacy of the information base despite the low interaction rate and ability to verify against observer data and population statistics. The addition of CCTV monitoring for the 2021 season may provide an additional measure to provide assurance on the adequacy of the data but as that data is not systematically reviewed (only upon reported incident) and the protocol of the system has only been used once. **SG100 is not met.**

b	Information adequacy for management strategy			
	Guide post	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and support a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Yes	Yes	No

Rationale

Information about the catch of ETP species by the UoA vessels is available from SMRU observer trips and logbook records. These observer programmes provide quantitative information about the catch of ETP species in the fishery. The information base from the observer program is now four years in its current form but observations in the past were sporadic and provided similar conclusions. That ETP interactions are on the whole rare, meaning that capturing them in an observer program which is not on every trip is unlikely and therefore there is the need for the CSMA logbook records to accurately record interactions. Logbooks are listed by MSC as a less reliable source than independent observation (GSA3.6.3) and the lack of completed logbooks by some vessels is limiting. The addition of CCTV for 2021 should resolve this issue provided that vessels report incidences of capture for the independent panel to review. This process is new and yet to be fully tested

The information base so far has been adequate to determine which species are susceptible to contact with the UoA and the management strategy response has been proactive in adding additional measures (CCTV, handling procedures) to the strategy where required. **SG60 is met.**

At the SG80 level the addition of observer data (now 4 years) and logbook records provides adequate data to make inferences into trends (none) in ETP catches, and whilst none are evident there is active management by the UoA to manage any impacts (CCTV, updated handling procedures) **SG80 is met. SG100 is not considered met at present** due to the lack of CSMA logbook completeness across the fleet preventing a high degree of certainty being achieved and there is no unified approach which could be considered a comprehensive strategy.

References

References listed in Table 22 and Table 23 and Table 24.

EC Habitats Directive (92/43/EC), the Wild Birds Directive (2009/147/EC) and the UK Wildlife Act 1981 (updated 2008) (UK 2008).

Vessel lookbooks

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Overall Performance Indicator score	80
Condition number (if relevant)	N/A

Scoring table 15. PI 2.4.1 – Habitats outcome

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue	SG 60	SG 80	SG 100	
a	Commonly encountered habitat status			
Guide post	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	
Met?	Yes	Yes	Yes	

Rationale

The term “commonly encountered habitats” is defined in MSC Standard v2.01 at SA3.13.3.1 as: - “...a habitat that regularly comes into contact with a gear used by the UoA, considering the spatial (geographical) overlap of fishing effort with the habitat’s range within the management area(s) covered by the governance body(s) relevant to the UoA.” The term “serious or irreversible harm” is defined for commonly encountered habitats in MSC Standard v2.01 at SA3.13.4 as: - “...reductions in habitat structure and function (as defined in Table SA8) such that the habitat would be unable to recover at least 80% of its structure and function within 5-20 years if fishing on the habitat were to cease entirely.” These definitions provide the context for the assessment of this SI.

The commonly encountered habitat elements under consideration here are defined by The EMODnet Seabed Habitats website and cross referenced against the known fishery footprint of the fleet (section 6.2.6.3). The commonly encountered habitats are circalittoral fine sand, circalittoral muddy sand and circalittoral coarse sediment. For assessment purposes, the MSC requires that benthic habitats are described according to certain criteria (SA3.13.2 and Table GSA6, MSC FCR v2.01) and this done below based on the evidence of:

- characterising substratum - circalittoral fine sand, circalittoral muddy sand and circalittoral coarse sediment
- geomorphology - flat to low ripple
- biota - burrowing fauna, low flora

There are two direct impacts relevant to the UoA and habitats. The 1st is physical disturbance from the purse line (and the bottom of the net) scrapping the seabed as it is retrieved. There is no sediment penetration with this type of net but there the possibility of scrapping and dislodgement of epibenthic fauna and flora as is the risk of entanglement with rocks/boulder although these ‘hard grounds’ are avoided by the UoA. As discussed in section 6.2.6.2, the risk of this pelagic gear contacting the seabed is limited to shallow waters, where the vertical height of the net whilst fishing (distinct from the actual net height) is greater than the depth of the water. This is estimated to be 30 m for the largest vessels in the fleet and therefore taken as the depth limit for the entire fleet.

The [MarLIN](#) website provides detailed sensitivity analysis of the commonly encountered habitats which consist of resistance and sensitivity ratings based on pressure types (Table 28). One of the recorded and analysed pressure types is ‘*abrasion/disturbance of the surface of the substratum or seabed*’ which describes the impact of this UoA. For each scoring element, it records that recovery of all the habitat subtypes has been classified as occurring within 10 years (*Arenicola marina* in infralittoral fine sand or muddy sand being the longest). As such as per MSCs definition of SA3.13.4 ‘*recover at least 80% of its structure and function within 5-20 years*’ can be met.

The 2nd potential impact on habitats is lost gear resulting in entanglement and removal of epibenthic life. Net loss in the UoA is very low and there is only one reported incident in the fishery as per the incident in 2020 section 6.2.2.3 (Jones et al. 2020). In this instance best efforts are made to recover the net, and this was successful. As nets cost upwards of £80,000 each there is a strong interest to recovery them (R. Caslake pers. Comm). Furthermore, the lack of emergent epibenthic fauna and flora in the main commonly encountered habitats mean this direct effect is considered low.

SG60 and SG80 are considered met based on the likelihood of the abrasion and gear lost impacting the commonly encountered habitat elements under consideration here. **SG100 is met** on the evidence provided from the MarLIN website (and references within) along with the information of rare gear loss and recovery efforts.

b		VME habitat status		
Guide post	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	
Met?	Yes – all elements	Yes – all elements	Yes – all elements	

Rationale

As per SIa above the two impacts requiring consideration to VMEs are abrasion from the net and net loss. Sensitivity analysis is available for VMEs below as described in SIa.

“Vulnerable Marine Ecosystems” (VMEs). These are defined in MSC Standard v2.01 at SA3.13.3.2 as: - “A VME shall be defined as is done in paragraph 42 subparagraphs (i)-(v) of the FAO Guidelines⁷ (definition provided in GSA3.13.3.2). This definition shall be applied both inside and outside EEZs and irrespective of depth.” Further to this, the MSC has issued an interpretation which indicates that to be considered as VMEs under this SI, a habitat must have been: - “accepted, defined or identified as such by a local, regional, national or international management authority / governance body”

The term “serious or irreversible harm” is defined for VMEs in MSC Standard v2.01 at SA3.13.4.1 as: - “In the case of VMEs the team shall interpret “*serious or irreversible harm*” as reductions in habitat structure and function below 80% of the unimpacted level.”

The term “unimpacted level” has also been defined by an MSC interpretation which indicates that the year 2006 serves as a cut-off date for historical impacts: only impacts that occurred after this date (or the date when a VME is identified) should be taken into account.

Applying the MSC definitions to the UoA, the areas that should be considered as VMEs are those that were formally identified and accepted by the UK through its former membership to the EU and through its national legislation. Following the UKs departure from the EU Special Areas of Conservation (SAC) and Special Protection Areas (SPA) are renamed under The Conservation of Habitats and Species Regulation 2017 (UK 2017) and its (Amendment) (EU Exit) Regulations 2019 (UK 2019), these sites are now known as the ‘National Site Network’. The National Site Network’s objectives are identical to those of the EU through the Natura 2000 program e.g. to maintain features in ‘favourable conservation status (FCS)’ and in almost all government pages and references in 2021 they are still referred to as SPAs and SACs, therefore we continue to use those terms here.

At the EU level the “Natura 2000” programme provided the overall strategy and the legislative mechanism for protecting these areas is set out in the EU “Habitats Directive”, which has been transposed into UK legislation (HM 2017b) and (HM 2019). The location of the Natura 2000 “Special Areas of Conservation” (SACs) and Special Protection Areas (SPAs) (now National Site Network) designated in the UoA area of operation are shown and discussed in section 6.2.6.7. The assessment team, based on evidence gathered on fishery footprint (section 6.2.6.3) and these protected areas (section 6.2.6.7) do not consider that there is overlap between the majority of these and the fishery. This is not because of legislation preventing fishing in these sites but rather the sites occupy areas where ring netting is not a viable fishing method due to rough ground, areas which are too shallow (intertidal) or too deep (no contact between gear and seabed).

There are two sites which potentially have overlap with the UoA – Plymouth Sound SAC and the Fal and Helford SAC. The VMEs identified here are seagrass and maerl

In addition to the Natura 2000 sites, the UK Government has also identified and designated a network of “Marine Conservation Zones” (MCZs) within the UK EEZ under the UK Marine & Coastal Access Act 2009. The MCZs protect a range of habitats including subtidal sediments, rocky areas etc. The MCZs of Runnel Stone, Mounts Bay, Whitsand Bay and Looe Bay MCZs overlap with the fishery and are discussed in section 6.2.6.6. A third MCZ the Helford Estuary no longer overlaps with the UoA as netting in this MCZ is banned (CIFCA 2017c).

Runnel Stone MCZ is designated for the protection of eight habitat types and one species (Pink sea-fan (*Eunicella verrucosa*)). Of the habitats, three are intertidal and have no overlap with the fishery and of the remaining six only two (subtidal sand and subtidal coarse sediment) are likely to overlap with the fishery but occupy water deeper than the fishery is likely to come into contact with (> 30 m depth) (Figure 41 and Figure 42). The other four features (three high/moderate rock habitats and the pink seafan) are located on the subtidal cliff lines of the MCZ where it would be too dangerous for the UoA to operate or too deep for interaction to occur (Figure 41 and Figure 42).

Mounts Bay MCZ is designated for the protection of two species groups - Giant goby (*Gobius cobitis*) and Stalked jellyfish (*Haliclystus spp. Lucernariopsis spp.*) which are found in the seagrass beds. There are eight habitats within the MCZ of which two are relevant to this fishery subtidal sand and seagrass (Figure 13, Figure 14). The others are intertidal habitats outside of the fishery footprint: Moderate energy intertidal rock, High energy intertidal rock, Intertidal coarse sediment, Intertidal sand and muddy sand, Moderate energy infralittoral rock, High energy infralittoral rock) (DEFRA 2016). With respect to the seagrass component of this MCZ it’s distribution within the MCZ is recorded in Figure 44.

As per the Mounts Bay MCZ, of the eight habitats of the Whitsand Bay and Looe Bay MCZ the ones relevant to this fishery are subtidal sand and seagrass (Figure 46, Figure 47). The other six habitats are intertidal and have no overlap with the fishery and are not considered further in this assessment. The four feature species are ocean quahog (*Arctica islandica*) a burrowing bivalve (too deep to be impacted by net abrasion), pink sea-fan (*Eunicella verrucosa*) only found on rocky ground (outside of the fishery footprint) and sea-fan anemone (*Amphianthus*) and stalked jellyfish (*Haliclystus auricula*) – found in the seagrass (CIFCA 2014).

Subtidal sand with respect to these MCZs is considered under commonly encountered habitats Sla above as this follows MSC clause SA3.13.3.1 for commonly encountered habitats. Thus for MCZs seagrass is the only VME considered under this assessment which has potential overlap with the fishery.

VMEs

For assessment purposes, the MSC requires that benthic habitats are described according to the following criteria (SA3.13.2 and Table GSA6, MSC FCR v2.01) and this done below based on the evidence of:

- characterising substratum - subtidal sand
- geomorphology - flat to low ripple
- biota – seagrass, emergent epifloral, maerl emergent fauna

Seagrass

Seagrass is listed under OSPAR as a threatened habitats (OSPAR agreement 2008-6), meaning all seagrass beds should be considered VME. Despite being nationally scarce seagrass meadows are found across the Western Approaches of the English channel beyond the footprint of the UoA (Figure 59).

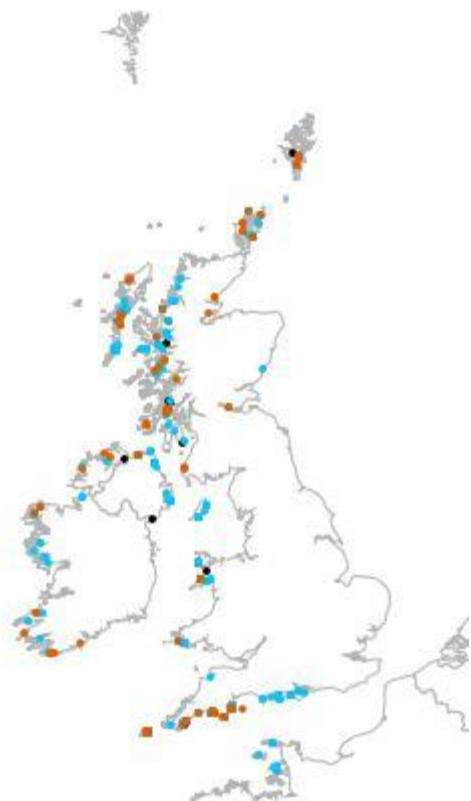


Figure 59. *Zostera marina* beds on lower shore or infralittoral clean or muddy sand. Orange dots core records, Blue dots certain records. Source: <https://www.marlin.ac.uk/habitats/detail/257>

Overlap between the fishery and seagrass within the fishery footprint is shown in Figure 38. A study in 2021 found that for 2019 only 1.21% of fishing locations were within 100 m of seagrass and were consequently close enough to potentially cause any damage (scrapping of the surface) (Stanton 2021). The authors noted at the time that definitive overlap between the fleet and the habitat cannot be established for all seagrass locations as the data set used for seagrass was limited spatially. The author recommended that consideration should be taken when using ring nets in relatively shallow water and specifically when fishing near seagrass (Stanton 2021). Since that study was published CIFCA have undertaken significant steps to map the location of seagrass throughout the district using acoustic survey. This work is ongoing and includes reports on the extend of seagrass in Plymouth Sound (Jenkin et al. 2021) , Whitsands Bay and Mounts Bay (Figure 39) with the full reports of the latter two sites expected in 2022. The extent of seagrass in Plymouth is also known from the Habitat Risk Assessments (HRA) of 2016 (Figure 49).

The HRAs conducted by Devon and Severn IFCA show abrasion as the only habitat risk (DSIFCA 2016c). MarLIN sensitivity analysis of the seagrass habitat suggest recovery from abrasion events will be fairly rapid. This is despite the low level of resilience to just events. Experimental trials of seagrass removal in the UK suggest that recovery is due exclusively to rhizome growth from adjacent perennial eelgrass and was complete within 24 months. Denuded transition zone patches took almost twice as long to recover to control densities (Boese et al. 2009). Recovery from fishing (raking – abrasion and scrapping of the sediment) took only four months after cessation of the extraction activity with the biomass and density values of *Z. marina* reached similar values to those measured in the non-impacted site (Barañano et al. 2017).

Based on the low overlap between seagrass and the fishery evidenced in the 2021 report, its wider distribution in South West UK and the recovery rates of the seagrass beds (MarLIN website, Boese et al. (2009)) the team concluded that **SG60 and SG80 are met**. With respect to SG100 the Stanton (2021) report provides an evidence base of likely impact, overlapped with the footprint of Mounts Bay. Figure 59 shows the evidence of distribution in the UK and the references and analysis within the MarLIN website and experimental recovery rates (Boese et al. 2009) provide evidence of recovery **SG100 is met**.

Maerl beds

Maerl is listed under OSPAR as a threatened habitats (OSPAR agreement 2008-6), meaning all maerl beds should be considered VME. Maerl beds distribution is concentrated in Scotland within the UK, with isolated records in southern England (Figure 60) within estuaries and inlets. The current evidence regarding the recovery of maerl suggests that if maerl is removed, fragmented or killed then it has almost no ability to recover. Therefore, resilience probably far exceeds the minimum of 25 years for this category on the scale in cases where the resistance is Medium, Low or None. Hall-spencer (2009) (cited in https://www.marlin.ac.uk/habitats/detail/255/maerl_beds) suggested that large long-lived species may take 20-50 years to recover. Within the UoA footprint there is no evidence of fishery overlap with this VME on account of the Cornwall IFCA River and Estuarine Fishing Nets Byelaw 2017 (CIFCA 2017c) which prevents netting activity in the Helford and Fal estuary and protects the Maerl bed feature (C. Trundle (CIFCA) pers. Comm). **SG60 and SG80 met** There is no evidence of any UoA breaching this bylaw and therefore **SG100 is met**.

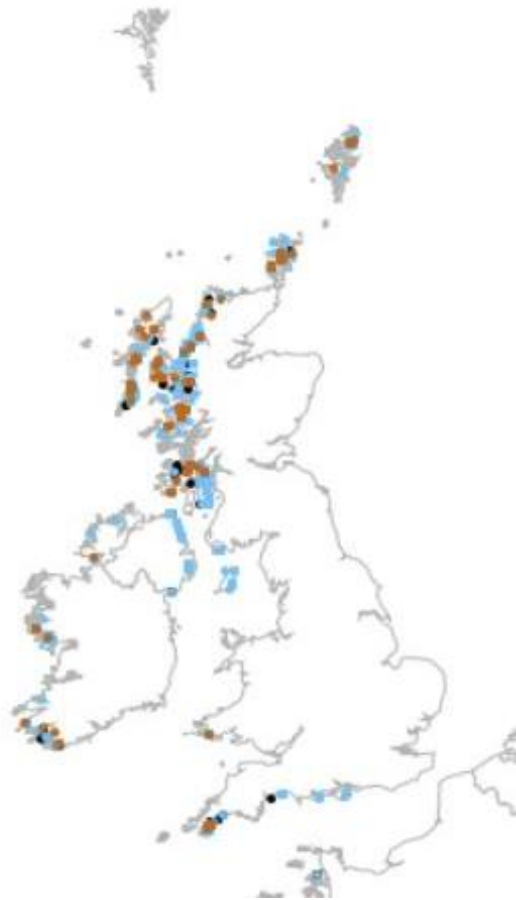


Figure 60. Maerl beds distribution UK. Orange dots core records, Blue dots certain records. Source: https://www.marlin.ac.uk/habitats/detail/255/maerl_beds

The 2nd potential impact on VME is lost gear resulting in entanglement and removal of epibenthic life. Net loss in the UoA is very low and there is only one reported incident in the fishery as per the incident in 2020 section 6.2.2.3 (Jones et al. 2020). In this instance best efforts are made to recover the net, and this was successful. As nets cost upwards of £80,000 each there is a strong interest to recovery them. This direct effect on VMEs is considered low on the basis of low loss rate, recovery and low overlap with the VME habitats.

c	Minor habitat status	
	Guide post	There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
	Met?	Yes

Rationale

Minor element - high energy circalittoral rock, orange and high energy infralittoral rock.

There is evidence in the form of fishery footprint (Figure 38) which shows the fishery does not operate close to these minor habitats. There is recorded qualitative evidence of the damage that is done to nets by rough ground and that fishers actively avoid shooting nets on shoals of fish when they are over hard ground. **This Scoring Guidepost is met.**

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OSPAR agreement 2008-6

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https://www.marlin.ac.uk/habitats/detail/255/maerl_beds

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Figure 34, Figure 35, Figure 36, Figure 37, Figure 39, Figure 38, Figure 40, Figure 41, Figure 42, Figure 43 , Figure 44

Overall Performance Indicator score	100
Condition number (if relevant)	N/A

Scoring table 16. PI 2.4.2 – Habitats management strategy

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats		
Scoring Issue	SG 60	SG 80	SG 100	
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	Yes	Yes	No

Rationale

In the context of this performance indicator (Source: MSC FCR v2.01; Table SA8):

- “Measures” are actions or tools in place that either explicitly manage impacts on the component or indirectly contribute to management of the component under assessment having been designed to manage impacts elsewhere.
- A “partial strategy” represents a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically.
- A “strategy” represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome, and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts.

Measures considered for habitat management of the UoAs fall under the UK national strategy in place for protecting marine habitats and the technical regulations /type of gear used by the UoA as listed below:

1. Special Areas of Conservation (SAC) and Special Protection Areas (SPA) which were designated under the EU Habitats and Birds Directives (EU 2009; EU 1992) as Natura 2000 sites are now legislated as the National Site Network with objectives identical to those of the original SPAs and SACs: maintain the features in ‘favourable conservation status (FCS)’. The UK national legislation is The Conservation of Habitats and Species Regulation 2017 (HM 2017b) and its (Amendment) (EU Exit) Regulations 2019 (HM 2019). This legislation allows for management plans to be drawn up for these National Site Network and requires that the impacts of all licensed activities (“plans or projects”) taking place within these sites are assessed in order to avoid significant effects or damage to the integrity of the designated

feature(s). The definition of “plans or projects” is wide but does include fishing activities, where relevant. For example see section 6.2.5.1 which shows how a risk assessment was undertaken for the fishery impact of the birds feature of the [Falmouth Bay to the St Austell Bay SPA](#). The main management instrument for assessing the risk posed by the UoA to these sites are Habitats Regulations Assessments (HRA). These are compiled by a competent authority and in the case of fishing in Cornwall this is Cornwall IFCA. Two bylaws are in effect for the SACs relevant to this assessment in Cornwall these are:

- Cornwall IFCA River and Estuarine Fishing Nets Byelaw 2017 (CIFCA 2017c) which prevents netting activity in the Helford and Fal estuary and protects the Maerl bed feature.
- Closed Areas (European Marine Sites) No 2 byelaw (CIFCA 2012) which prevents towed gear (including ringnets) being used within the boundaries of the marine sites if they are in contact with the seabed.

Three vessels within the CSMA (those registered in Plymouth) are permitted to fish within Devon waters and have been issued mobile Fishing Permit from the D&S IFCA under their Mobile Fishing Permit Byelaw. Under the permit condition 3.4 it states:

3.4 In the areas as defined by the coordinates set out in the attached Annex 4 of this Permit (Plymouth Sound and Estuaries Special Area of Conservation), (including the rivers Plym, Tamar, Tavy and Yealm) a permit holder or named representative is not authorised to use demersal mobile fishing gear except where; access is authorised for an encircling net where the footrope may be in contact with the seabed to be used in the area as defined by the coordinates set out in the attached Annex 4a of this Permit. (Figure 50).

2. A network of Marine Conservation Zones (MCZs) has been designated around England and Wales to protect nationally important, rare or threatened marine habitats or species. The location of the MCZs relevant to the fishery under assessment discussed under section 6.2.6.6. of relevance to this fishery is Mounts Bay, Helford Estuary and Whitsand and Looe Bay MCZ. UK Statutory Nature Conservation Bodies (SNCBs) and Marine Management Organisation (MMO) can provide advice and introduce measures to protect MCZ features. No site-specific management measures have been proposed for Mounts Bay at present. For the Whitsand and Looe Bay MCZ there is the Whitsand and Looe Bay MCZs the Marine Conservation Zone (Fishing Restrictions) Byelaw 2018 (CIFCA 2018) in place. For the Helford Estuary all netting activity is prohibited by the Cornwall IFCA River and Estuarine Fishing Nets Byelaw 2017 (CIFCA 2017c) and there has been no effort /sanctions to the fleet to this since its designation (SA3.14.2.2)
3. Gear type – the gear type of this fishery acts a measure in itself with respect to habitat impacts. Purse seine gear is a pelagic gear type which is not designed to interact with the benthic environment. Where it does interact, it can lead to net damage. In this fishery where there is a risk of the net interacting with the bottom (shallow waters to ~30m) vessels consider the bottom type before deploying to avoid anything but low relief sediment. Thus the gear acts a measure to avoid interaction with all other benthic habitat types. Detailed information about the distribution of fishing effort is available and this shows that whilst there is very limited overlap with a number of VME areas, most fishing activity takes place on the “commonly encountered habitats” in the area under consideration.
4. Limited spatial profile for habitat interaction – the UoA gear limits benthic interaction to approximately ~30 m therefore limiting any interaction to the nearshore subtidal habitats. Furthermore, the fishery footprint is concentrated in specific areas (Mounts Bay and Mevagissey predominately) limiting the habitat spatial impact further still.

The assessment team consider that **SG60 and SG80 are met** on the basis of there being multiple measures which work together to limit the interaction of the UoA with the identified habitats in this assessment and that it is high likely that no serious or irreversible harm is going to occur. The fishery’s impact is limited to a nearshore area by the gear used and the UoA only target sardine in shallow water when they occur over less sensitive (sediment habitats). The nearshore sensitive habitats are under regulation by the UK and subject to risk assessments for any plan or project that might impact them such as fishing.

In relation to **SG100** the assessment team are not aware of – as required by SA3.14.2.1 – a sufficiently developed comprehensive management plan that is supported by a comprehensive impact assessment, which determines that all fishing activities will not cause serious or irreversible harm to VMEs. **SG100 is not met.**

Note [MSC derogation 5](#) was applied in this SI.

b	Management strategy evaluation			
	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
	Met?	Yes	Yes	No

Rationale

The following can be considered evidence that the gear type and scale / intensity of the UoA is not highly likely to damage the habitats.

1. The gear is a pelagic gear and is not designed to contact the seabed. When this does happen it is limited by depth <30 m and vessels will only allow contact in shallow water where the substrate is known to be sedimentary not rock. The risk to commonly encountered sediment habitats to abrasion events is low and the evidence for this is the MarLIN risk analysis, the fishery footprint and the habitat mapping in the area of consideration.

The MarLIN impact assessment on the commonly - encountered and VME (seagrass) habitats show that recovery from abrasion like the direct effect of the ring nets is not high. See Table 30. There is a recent study (testing) on the impact of the UoA on seagrass, which identified the risk as being low (Stanton 2021). For maerl, the UoA is prohibited from the area where this VME is found by the Cornwall IFCA River and Estuarine Fishing Nets Byelaw 2017 (CIFCA 2017c).

On the basis of the above **SG60 and SG80 are met.** Despite the testing of the UoA impact on seagrass and the continued work to map these sites there is no evidence of testing on the commonly encountered habitats from the UoA suitable to meet the SG100 requirement. **SG100 not met.**

c	Management strategy implementation			
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	Guide post	There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?	Yes	No

Rationale

The following can be considered evidence of successful implementation.

1. The designation of SACs and MCZs within the UoA area provides quantitative evidence that the UK strategies for marine habitat protection are being implemented successfully.
2. That closed areas have been designated (Helford MCZ/SAC, Plymouth SAC, Whitsand Bay MCZ) and fishing gear tests carried out (Falmouth Bay to the St Austell Bay SPA) provides evidence that risk assessments are being undertaken and applied.
3. There has been no effort /sanctions on the fleet relation to any of the closed areas this since their designations this shows that the UoA is respecting the designations (MMO and CIFCA pers. Comm)

On this basis **SG80 is met. SG100 is not met** as the team is not aware of the status of the designated features in all of the sites and how often monitoring of those features is occurring.

d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs			
	Guide post	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	There is some quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is clear quantitative evidence that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	Yes	Yes	Yes

Rationale

There is good information available to show the extent of UoA activity relative to VMEs in the area. The VMEs have all been identified. Management documents have been reviewed for all of these sites. There has been no effort /sanctions on the fleet relation to any of the closed areas (Helford MCZ/SAC, Plymouth SAC, Whitsand Bay MCZ) since their designations this shows that the UoA is respecting the designations.

The client group holds meetings with SIFCA (the key competent authority) which ensures that the fishery is informed about, and has input into, the management of these sites. This provides both qualitative and quantitative evidence that the protection measures are being complied with.

There is no evidence of any protection measures other than these statutory designations being in place for other MSC UoAs (Cornish hake) in subarea 7 or non MSC fisheries.

On the basis of the above **SG60 to SG100 are met.**

References

CIFCA (2005), Stanton (2021), EU (2009; 1992), UK (2017; 2019), CIFCA (2017c; 2017a; 2017b; 2014), DSIFCA (2018a; 2018b; 2016a; 2016c; 2016b)

Figure 33, Figure 32, Figure 36, Figure 37, Figure 40, Figure 43, Figure 44, Figure 38, Figure 59.

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Overall Performance Indicator score	85
Condition number (if relevant)	N/A

Scoring table 17. PI 2.4.3 – Habitats information

PI 2.4.3	Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat		
Scoring Issue	SG 60	SG 80	SG 100
a	Information quality		
Guide post	<p>The types and distribution of the main habitats are broadly understood.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA:</p> <p>Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA:</p> <p>Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.</p>	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
Met?	Yes	Yes	No

Rationale

Evidence of the types of distributions of habitats relevant to the area under consideration are available from the EMODnet Seabed Habitats website (Figure 36 and Figure 37) at a level of resolution suitable to define the key habitats within the area of consideration. These have been defined as circalittoral fine sand or circalittoral muddy sand, circalittoral coarse sediment (commonly encountered habitats elements), high energy circalittoral rock, orange and high energy infralittoral rock. Maps of these benthic habitats found in the UoA is presented in Figure 36 and Figure 37 of this report. Therefore **SG60 is met**.

The vulnerability of those habitats to direct effects (abrasion by the nets) is evaluated at the biotope (habitat sub-categorisation based on community structure) under the MarLIN program (www.marLIN.ac.uk) which is a peer-reviewed process based on the Marine Evidence based Sensitivity Assessment ([MarESA](#)). The vulnerability information for the main and minor habitats are shown in Table 28, Table 29 and Table 30. The recovery rates of these habitats (required in part to score PI 2.4.1) are known and shown in the same tables for the abrasion affect by the UoA. It is also known from wider research that recovery rates from fishing gear interaction of shallow habitats (which the UoA does interact with) are more rapid than deeper water habitats on which the UoA has no interaction (Hiddink et al. 2017; Kaiser et al. 2018).

The location of National Site Networks designated in the UoA are described in section 6.2.6.7 and the boundaries of these sites are defined. Equally the UK network of “Marine Conservation Zones” (MCZs) relevant to the UoA 6.2.6.5. The UK Government has published detailed information about the habitats found within all of these areas which can be cross referenced against the vulnerability in the MarLIN assessments.

Finally there is a recent study on the UoAs impact on seagrass (VME) (Stanton 2021), which defines the vulnerability of this habitat based on UoA overlap (1.21%) suitable to meet SA3.15.4.

On the basis of the above the team consider **SG80 to be met**. The Stanton (2021) study note that definitive overlap between the fleet and the habitat cannot be established for all seagrass locations, as the data set used for seagrass was limited spatially and no testing of the vulnerability of the gear to all habitats has been completed, therefore **SG100 is not met**.

b	Information adequacy for assessment of impacts			
	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	The physical impacts of the gear on all habitats have been quantified fully.
	Met?	Yes	Yes	No

Rationale

There is generic information available about the likely impact of ring nets on marine habitats – none (<https://www.seafish.org/responsible-sourcing/fishing-gear-database/gear/la-ring-net/>), but in the UoA its known that interaction with the benthos occurs upwards of 30 m depth on occasion through abrasion of the substrate (Stanton 2021) (CSMA comments). Good information is available to determine the spatial overlap between the main habitats and fishing gear - topography data (Figure 34 and Figure 35), habitat distribution (Figure 36 and Figure 37), fishery footprint (Figure 33 and Figure 32) and closed area – defined in the Cornwall IFCA River and Estuarine Fishing Nets Byelaw 2017 (CIFCA 2017c) - Helford River: The area within tidal limits, to landward of a geodesic line drawn 195° True from Mawnan Shear (50° 05.980’N 005° 06.000’W) to a point on the opposite shore at 50° 05.585’N 005° 06.155’W.

On this basis **SG60 and SG80** are met. **SG100 is not met** on the basis that impacts have not been qualified on all habitats.

c	Monitoring		
	Guide post	Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?	Yes	No

Rationale

An increase in risks to habitats could result if fishing vessels changed their pattern of activity to include vulnerably or hitherto unimpacted habitats. This change would be detected by the monitoring arrangements in place for the fishery which include tracking of vessel movements via logbooks and also the reporting and monitoring of catches (which could detect a change in catch composition indicative of a change in practice).

All vessels in the UoA are required to report the location of fishing activity via logbooks and their movements are monitored by MMO officers. These mechanisms would detect an increase in risk to habitats resulting from a change in patterns of fishing activity. Risks to VMEs under the SPA, SAC and MCZ regulations are monitored through the Habitats Regulations Assessments (HRA) and the competent authority (CIFCA). **SG80 is met.**

Although the distribution of all habitats is known, and some are monitored (SACs etc) the changes in distribution over time is not measured. **SG100 not met.**

References

topography data (Figure 34 and Figure 35), habitat distribution (Figure 36 and Figure 37), fishery footprint (Figure 33 and Figure 32)

Fishery logbooks,

www.marLIN.ac.uk and [MarESA](#)

<http://fishing-app.gpsnauticalcharts.com/i-boating-fishing-web-app/fishing-marine-charts-navigation.html?title=Penzance+Bay+boating+app#10.55/50.0661/-5.2739>

<https://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/?zoom=5¢er=-5.749,56.543&layerIds=500,501,502&baseLayerId=-3>

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DSIFCA, 2016c. European Marine Site: Plymouth Sound & Estuaries - Ss, Devon and Severn Inshore Fisheries Conservation Authority.

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Overall Performance Indicator score	80
Condition number (if relevant)	N/A

Scoring table 18. PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guide post	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Yes	Yes	Yes

Rationale

Based on the key pressures identified in section 6.2.7., the ecosystem elements under consideration here are food web dynamics and change in trophic structure as a result of climate change.

The Celtic Sea Ecosystem comprises: ICES Area 6a; 7a; 7b 7f-k (Celtic Sea) and the Western Channel (7e). The area of the Cornish Sardine fishery covers division 7e in the Western Channel and division 7f in the Celtic Sea which both form part of this Eco-region.

The potential impact on ecosystem elements from the UoA would be through changes to the trophic structure of the ecosystem given that sardines are a forage species and resulting from overfishing. However, there is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem and function given that:

- Sardines are an important prey species to support fish higher in the food chain, but the main predator fish species in the Celtic Sea Eco-region (hake, megrim, monkfish, whiting, cod and saithe) are all generalist feeders which show size-dependent, temporal and spatial prey-switching behaviour (Hernvann et al. 2020; Lauria 2012; ICES 2008) (Figure 54 and Figure 57). A modelled foodweb study also confirmed that the abundance of sardine (as grouped within the small pelagic spp. functional group) was unlikely to significantly affect the abundance of seabirds in the Celtic Sea (Lauria 2012). CEFAS also agree that there are no known predators that are entirely reliant on sardine presence (Personal Communications, Jeroen Van Der Kooij, CEFAS, 6th July 2015 referenced in Cieri et al. (2017));
- UoA impact on non-target species is minimal (Table 15 and Table 16) (PI2.2.1 and PI2.1.1) therefore disruption of the food webs from UoA bycatch is highly unlikely from these elements;

- CEFAS research programme suggests that sardine abundance appears to be good and populations also have a good age and length distribution (CEFAS 2019; CEFAS 2020b);
- Modelling implies sardines are likely to increase in abundance as waters warm (Hervann et al. 2020);
- Sardines are widely distributed within the Eco-region compared to the fishery which is highly localised (Figure 57);
- The fishery is on a very small scale compared to the overall scale of the ecosystem, covering less than 1% of its total area.

Based on this evidence, the UoA meets **SG60, SG80 and SG100**.

References

(Figure 54 and Figure 57).

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CEFAS, 2020. Research Vessel Survey Report - RV CEFAS Endeavour Survey: C END 16-2020., CEFAS.

Overall Performance Indicator score	100
Condition number (if relevant)	N/A

Scoring table 19. PI 2.5.2 – Ecosystem management strategy

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, which take into account the potential impacts of the UoA on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan, in place which contains measures to address all main impacts of the UoA on the ecosystem , and at least some of these measures are in place.
	Met?	Yes	Yes	No

Rationale

In the context of this performance indicator (Source: MSC FCR v2.01; Table SA8):

- “Measures” are actions or tools in place that either explicitly manage impacts on the component or indirectly contribute to management of the component under assessment having been designed to manage impacts elsewhere.
- A “partial strategy” represents a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically.
- A “strategy” represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome, and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts.

At the EU / UK level, the management arrangements in place for delivering the Ecosystem Approach to Fisheries Management (EAFM) are the EU Marine Strategy Framework Directive (MSFD, Directive 2008/56/EC); the EU Common Fisheries Policy (CFP, Regulation 2013/1380/EC); the Western Waters Multi-Annual Plan (MAP) (EU 2019a); the UK fisheries Act (UK 2020) and bilateral agreements (UK 2021c) which together sets out the management regime for fisheries in the Celtic Sea ecosystem. Together, this legislation provides a strategy for achieving both “Good Environmental Status” (the objective of the MSFD); minimising ecosystem impacts of fisheries (CFP, Article 2.3); and implementing the ecosystem-based approach to fisheries management (MAP at Article 3(3)).

The effect of fishery removals on the ecosystem is addressed under annual TACs and quota management systems for key fish species that has been established by the EU and with the bilateral agreement. TACs are set under the MAP at a level compatible with MSY (Article 4); and all fishery-related mortality is taken into account to ensure that impacts on fish stocks (and hence the Celtic Sea ecosystem) are within appropriate limits.

With respect to sardine and other small pelagic stocks available measures are annual stock surveys of other small pelagics in the ecosystem – PELTIC surveys and ICES stock assessments where appropriate and annual updates on the key areas of concern in the Celtic ecosystem by ICES - (ICES 2019a; ICES 2020a)

MSFD and CFP and the UK national legislation provide a clear and coherent strategy for managing the ecosystem impacts of fisheries. This strategy coupled with the MAP for western waters **meets the SG60 and SG80 requirements** when combined with the monitoring of the stocks and their relationships.

SG100 is not met because the strategy is not yet an ecosystem management plan outright designed for ecosystem needs specifically but rather a series of strategies developed to manage components of the ecosystem and which together deliver only a partial strategy at the ecosystem level.

b	Management strategy evaluation			
	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	Testing supports high confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	Yes	Yes	No

Rationale

Information from the fishery and from independent monitoring indicates that there are low levels of capture of non-target species; acceptable levels of interaction with ETP species; and that it does not have an irreversible impact on vulnerable marine habitats.

As noted in section 6.2.7.1 pelagic stocks continue to be managed with acceptable biomass levels (above BMSYtrigger). CEFAS research programme suggests that sardine abundance appears to be good and populations also have a good age and length distribution (CEFAS 2019; CEFAS 2020b). Modelling implies sardines are likely to increase in abundance as waters warm (Hervann et al. 2020). Whilst the UoA does not appear to impact stock abundance (Principle 1).

Monitoring (through the annual surveys) will continue to check whether this remains the case. **SG60 and SG80 are met.**

SG100 is not met because although testing of parts of the ecosystem has occurred (e.g. sardine in the food web and sardine under a warming sea) the interaction of the UoA in these models is not explicit.

c	Management strategy implementation		
	Guide post	There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) .
	Met?	Yes	No

Rationale

Monitoring of the fishery both at sea and at points of landing (observers, MMO boardings, logbook compliance) ensures that technical measures and effort controls are observed. This provides evidence that the strategies in place to manage UoA impacts on non-target species are being implemented successfully, and information about the species concerned shows that the objectives of stock recovery and rebuilding are being met (see scoring for both primary and secondary species for each UoA above).

Catch reporting of areas fished for all vessels, provides ongoing monitoring of the overlap between the fishery and vulnerable marine habitats. There is evidence from the network of MCZs/SAC/SPAs sites within and adjacent to the UoA that this UK strategy is also being effectively implemented.

Reports on biomass and surveys for all trophic components associated with fishery are available.

SG80 is met.

There is not yet any evidence to show that the MSFD objective of “Good Environmental Status” has been attained, so the **SG100 requirements are not currently met.**

References

EU Marine Strategy Framework Directive (MSFD, Directive 2008/56/EC); the EU Common Fisheries Policy (CFP, Regulation 2013/1380/EC); the Western Waters MAP (EU 2019a);

Sections 6.2.7.1 and 6.2.7.2 and 6.2.7.3

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Overall Performance Indicator score	80
Condition number (if relevant)	N/A

Scoring table 20. PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Yes	Yes	

Rationale

The information sources available identify and understand the role of sardine in the ecosystem and the energy flow between trophic levels to score this SI are:

- The ecosystem modelling undertaken by research groups using ECOSIM software (Hervann et al. 2020; Lauria 2012; ICES 2008) which has created modelled foodwebs and scenarios (Figure 54 and Figure 57).
- Personal comment from the scientist lead on sardine stocks that there are no known predators that are entirely reliant on sardine presence (Personal Communications, Jeroen Van Der Kooij, CEFAS, 6th July 2015 referenced in Cieri et al. (2017)).
- Logbook and observer data on the low UoA impact on non-target species (Table 15 and Table 16) (SMRU 2018; SMRU 2019; SMRU 2022).
- CEFAS research programme suggests that sardine abundance appears to be good and populations also have a good age and length distribution (CEFAS 2019; CEFAS 2020b).

SG60 and SG80 are met.

b	Investigation of UoA impacts			
	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail.	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail.

	Met?	Yes	Yes	No
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Rationale

The key elements of the Celtic Sea (and specifically Western Channel) ecosystem are understood, including the impact of fishing pressure on food web dynamics, climate change and other factors such as primary production (Hervann et al. 2020; Lauria 2012; ICES 2008), and from this literature the impact of the sardine fishery can be inferred. **SG60 is met.**

These ecosystem studies show that sardines ecosystem role is not a limiting factor in bird biomass and is not a singular route for energy transfer in the ecosystem. CEFAS’s continued monitoring of the small pelagic stocks provide information on the scale and location of the stocks and from this the intensity of the UoA can be inferred. **SG80 is met.**

However, **this fishery is not awarded SG100** for this scoring issue as there are no specific studies yet published on the interaction between this specific fishery and the ecosystem elements.

c	Understanding of component functions			
	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .
	Met?		Yes	No

Rationale

The impacts of the fishery on the target, bycatch and ETP species have been identified and are known from landings data, self-sampling, and independent observer records. The main functions of the species that are affected by the fishery are understood from studies of the species concerned, their populations and biology, and also from ecosystem studies and models of the Celtic Sea. The distribution of marine habitats is also well known, and studies are ongoing.

There is evidence from published reports that the main functions of all ecosystem components are known, **meeting the SG80 requirements**.

Although the impacts of the UoA on the P1 target species and P2 components are known, it is not clear that the role of all ETP and habitats are understood. **SG100 not met.**

d	Information relevance			
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	Guide post	Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?	Yes	No

Rationale

Given the information available above, it is possible to infer the main consequences to the ecosystem. In addition to potential impacts on the ecosystem components (i.e. habitats, ETP species, retained and bycatch species), the main potential consequence identified is the effect on removing a forage species. This consequence was considered to be minor given the scale of the fishery, the state of the sardine resource and given that there are many other forage species available to the main predators within the Celtic Sea ecosystem. **SG80 is met.**

The fishery was not awarded 100 as there is no specific information yet published on the impacts of this specific fishery on all the elements and components of the ecosystem (for example no specific studies giving a quantifiable impact of the fishery on benthic habitats).

e	Monitoring		
	Guide post	Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?	Yes	No

Rationale

Sufficient data continue to be collected on retained, discarded and ETP species to detect any increase in risk level to the ecosystem. For instance, retained, discarded and interaction with cetaceans are recorded within CSMA log-sheets and supplemented with observer data. Furthermore the annual PELTIC survey ensures monitoring of the stocks and ETP species is maintained (CEFAS 2019; CEFAS 2020b). SMRU outside of the UoA also undertakes an on-going annual survey of cetacean bycatch within a range of selected fisheries (selected for their risk-level) and the status of seals within the UK through its annual reports. Finally ICES publish an annual report highlighting issues and area of interest in the ecoregion. **SG80 is met.**

The fishery is **not awarded SG100** for this scoring issue as there are no specific studies giving quantified impacts of the fishery on all elements of the ecosystem which would allow for development of specific strategies to manage on-going ecosystem impacts.

References

EU Marine Strategy Framework Directive (MSFD, Directive 2008/56/EC); the EU Common Fisheries Policy (CFP, Regulation 2013/1380/EC);

(Personal Communications, Jeroen Van Der Kooij, CEFAS, 6th July 2015 referenced in Cieri et al. (2017)), (Table 15 and Table 16).

CEFAS, 2019. Research Vessel Survey Report - RV CEFAS Endeavour PELTIC, Centre for Environment Fisheries and Aquaculture Science (CEFAS).

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Overall Performance Indicator score	80
Condition number (if relevant)	N/A

6.3 Principle 3

The year 2020 saw the end of the final one-year transition period for the UK to finally leave the EU (“Brexit”). The UK and the EU agreed to a Trade and Cooperation Agreement (TCA: (UK-EU 2020), applicable on a provisional basis from 1 January 2021, which addresses the domain of fisheries. Boundaries of the UK EEZ remain as defined according to the Exclusive Economic Zone Order 20135 of the UK Marine and Coastal Access Act 2009 (UK 2009) - see Figure 61.

A determination by ICES separated the North Atlantic sardine stock in subarea 7 (southern Celtic Seas and the English Channel) from that of subarea 8 (Bay of Biscay) in 2017, leading to an expedited audit of all Principle 1 indicators combined with the 1st annual surveillance audit of the previous certification cycle (Jones et al. 2018).

The subarea 7 sardine stock is distributed in the western English Channel and eastern Celtic Sea, and straddles UK and EU (France) waters. According to ICES latest scientific advice, the stock distribution doesn't extend as far south as the tip of Brittany, and French catches originating from ICES rectangles 25E5 (division 7h) and 25E4 (division 7e) have historically been allocated by ICES to Division 8.a, as they occur at the boundary and are considered to be more closely associated with the sardine stock in divisions 8a, 8b and 8d (ICES 2021a).

6.3.1 Legal and customary framework

6.3.1.1 UK-EU legislation

For fisheries operating on UK-EU shared stocks, the Trade and Cooperation Agreement (TCA) published on 31st December 2020 (Heading 5 – Fisheries)⁶ applies and provides high level long-term objectives that are clear, explicit and consistent with the MSC standard and the precautionary approach. The TCA allows for a transition period and a review every five years (art. 179). In its Part 2, the agreement sets out arrangements relating to the trade in goods and provisions for mutual fisheries access. In Chapter 7, the Agreement includes reciprocal commitments not to reduce the level of environmental or climate protection and, in Chapter 8, an affirmation by both parties of existing commitments to a range of international conventions and other commitments in the area of labour, environment, and climate, including to the effective implementation of the Paris Agreement.

For both EU and UK, the TCA objective for fisheries is set to “*exploit shared stocks at rates intended to maintain and progressively restore populations of harvested species above biomass levels that can produce the maximum sustainable yield*” (UK-EU 2020); having regard to:

- (a) applying the precautionary approach to fisheries management;
- (b) promoting the long-term sustainability (environmental, social and economic) and optimum utilisation of shared stocks;
- (c) basing conservation and management decisions for fisheries on the best available scientific advice, principally that provided by the International Council for the Exploration of the Sea (ICES);

⁵ <https://www.legislation.gov.uk/ukxi/2013/3161/made>

⁶ <https://www.gov.uk/government/publications/agreements-reached-between-the-united-kingdom-of-great-britain-and-northern-ireland-and-the-european-union>

- (d) ensuring selectivity in fisheries to protect juvenile fish and spawning aggregations of fish, and to avoid and reduce unwanted bycatch;
- (e) taking due account of and minimising harmful impacts of fishing on the marine ecosystem and taking due account of the need to preserve marine biological diversity;
- (f) applying proportionate and non-discriminatory measures for the conservation of marine living resources and the management of fisheries resources, while preserving the regulatory autonomy of the Parties;
- (g) ensuring the collection and timely sharing of complete and accurate data relevant for the conservation of shared stocks and for the management of fisheries;
- (h) ensuring compliance with fisheries conservation and management measures, and combating illegal, unreported and unregulated fishing; and
- (i) ensuring the timely implementation of any agreed measures into the Parties' regulatory frameworks.

The stock is a "non-quota stock". For UK-registered vessels, management measures of shared stocks that prevailed under the Common Fisheries Policy CFP still prevail in UK waters until the 31 December 2021. From 1st January 2022, fisheries management measures in UK waters could be replaced or even simplified, provided - for shared stocks - that the new measures delivered the same conservation benefit. In that case, they would need to be agreed as being proportionate and non-discriminatory in order to apply to non-UK vessels.

During the TCA transition period until 30 June 2026, each of the Parties has agreed to grant to vessels of the other Party full access to its waters to fish specified TAC and non-quota (this fishery) stocks in the respective Exclusive Economic Zones (EEZ), and in a specified part of the waters of the Parties between six and twelve nautical miles. This is done through a specific licence application for each vessel to the UK single issuing authority (UKSIA)⁷.

⁷ <https://www.gov.uk/guidance/united-kingdom-single-issuing-authority-uksia#approved-eu-vessel>

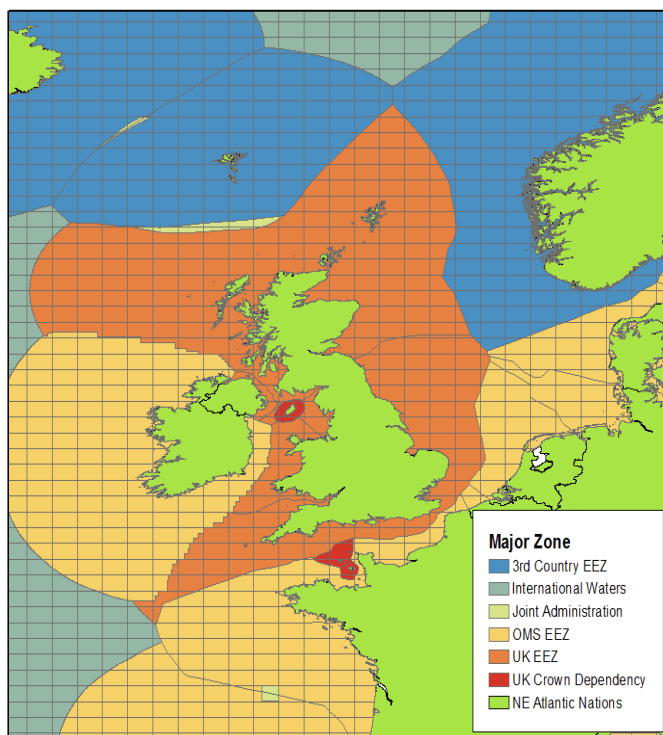


Figure 61. ICES statistical rectangles and major zones in Northeast Atlantic waters (OMS = other (EU) member states. Source: Williamson et al. (2018).

6.3.1.2 English and UK legislation

The overarching UK fisheries management system has evolved as a result of Brexit, with new primary and other legislation published in 2020. The UK Fisheries Act 2020 (UK 2020) modifying the UK Fisheries Bill of 2018 became law on 23rd November 2020. It provides the legal framework for the UK to operate as an independent coastal state from the European Union and gives details of what is kept (or not) of the Common Fisheries Policy (CFP) and its implementing regulations (see for details: Schedule 11 Retained direct EU legislation minor and consequential amendments⁸).

The Marine and Coastal Access Act 2009 established the MMO (UK 2009): Part 1 new Marine Conservation Zones (MCZs) and the IFCAs (UK 2009): Part 6 to succeed the Sea Fisheries Committees to manage inshore fisheries, with clear sustainability objectives and operational planning imperatives.

The fishery is operated by UK-registered vessels in what are now entirely UK waters. In addition, the fishery takes place in English territorial waters (inside 6 nautical miles) and is therefore managed by the local Inshore Fisheries and Conservation Authority (IFCA), here the Cornwall IFCA or CIFCA. The Devon and Severn IFCAs (DSIFCA) is also involved for a couple of vessels that are based in Plymouth, in close collaboration with the CIFCA. However, as member vessels of the CSMA, their sardine fishing activities are guided by the CSMA Code of Conduct and its fishery's co-management decisions.

The subarea 7 sardine stock straddles across the English Channel and has also been caught by French and other EU vessels, in what was then shared EU waters outside 12 nm. In 2018 and 2019, English vessels landed 76% and 88% of all sardines landed from subarea 7, respectively (Table 10). One will have to wait a few years to determine how much of the subarea 7 stock will be caught in UK and in EU waters respectively, and in UK waters by EU vessels. In practice, Brexit-led changes so far have had

⁸ Schedule 11 <https://www.legislation.gov.uk/ukpga/2020/22/contents/enacted>

little effect of the fishery's management, mainly because 1) the target species was not an EU quota-managed species, 2) the fishery has been taking place mostly inside UK territorial waters by UK vessels, and 3) relevant UK legislation was phased in to replace EU legislation by the end of the 5-year Brexit transition period 31st December 2020.

The 2017 Conservation of Habitats and Species Regulations, with its 2019 amendments to account for the EU Exit, (UK 2017; UK 2019), which lays down the specifics of marine species and habitats conservation after the EU Habitats Directive 92/43/EEC, has remained unchanged in its substantial content.

Similarly, the UK Marine Strategy of 2010 (UK 2010b), which followed from the EU Marine Strategy Framework Directive 28/56/EC of 2008, "*reflects the UK's vision for 'clean, healthy, safe, productive and biologically diverse ocean and seas'*", (and) helps to deliver key international obligations and commitments to protect and preserve the marine environment under the UN Convention on the Law of the Sea (UNCLOS), the UN Sustainable Development Goal 14 (to conserve and sustainably use the ocean, seas and marine resources for sustainable development), the OSPAR North-East Atlantic Environment Strategy and the Convention on Biological Diversity", is progressing along its 6-year cycle, with the latest round first two reports published in 2019 and 2021⁹. The Part One report provides "UK updated assessment and Good Environmental Status" (DEFRA 2019) and Part Two report describes the "UK updated monitoring programmes" (DEFRA 2021). Of interest for this fishery is the indication that the Pelagic Ecosystem survey developed under project POSEIDON (starting in 2012 in English waters of the Western English Channel, Bristol Channel and Celtic Sea) to monitor the pelagic food web, is listed as a new addition to the UK Marine Strategy monitoring programmes (DEFRA (2021): 53), which therefore gives it a more permanent status.

Presently, DEFRA (Department for the Environment, Food and Agriculture) is the key national ministerial institution for the drafting of primary legislation (e.g. Fisheries Act (UK 2020), Principles 1 and 2) and strategies (especially Principle 2, e.g. the Marine Strategy (UK 2010b; DEFRA 2019; DEFRA 2021)), which have been adopted after extensive stakeholder consultations. Following Brexit on 1st January 2021, a relatively large number of "retained EU"¹⁰ legislations sits alongside the Fisheries Act 2020 (UK 2020), which appears to be gradually incorporated into UK Fisheries legislation. An example, which is not directly pertinent to this fishery, regards changes in technical measures for the management of European seabass fisheries in the Celtic Sea made in 2021¹¹. As indicated in the UK Fisheries Act, incorporation may modify existing UK secondary legislation, or be incorporated in the domestic and foreign vessel licence conditions, the licences being delivered by the local MMO¹².

At local level, the Cornwall IFCA can adopt Codes of Conduct and draft Regulations and Bylaws that apply directly to the fishery, including to regulate fishing activities and fishing gear, and manage protected areas in its District, which covers the waters inside 6 nautical miles where the fishery is taking place. The fishery is subject to local and national legislation on protected areas and is bound by the CSMA Code of Conduct co-established with the IFCA in 2017 and reviewed annually. The present CSMA version (2019-20) (CSMA 2019b) sets out the following key obligations for CSMA's members' vessels and fishing activities:

- Maximum of 15 vessels;

⁹ see <https://www.gov.uk/government/publications/marine-strategy-part-one-uk-updated-assessment-and-good-environmental-status>

¹⁰ see <https://eurelationslaw.com/blog/retained-eu-law-a-guide-for-the-perplexed>

¹¹ see https://www.legislation.gov.uk/ukxi/2021/698/pdfs/ukxiem_20210698_en.pdf

¹² <https://www.gov.uk/guidance/understand-your-fishing-vessel-licence#fishing-vessel-licences-over-10-metre-vessels---category-a-pelagic>

- Ring nets with headline length no longer than 450m;
- Abiding by CSMA Slippage Policy;
- CSMA logbooks thoroughly and accurately completed in a timely manner and submitted for collation annually, before the AGM;
- Cetacean and seabird interactions will be recorded in logbooks whenever applicable;
- Research and data collection undertaken in order to improve scientific and technical knowledge of sardine fisheries, agreeing to take observers too sea when asked
- The harvesting, handling, processing and distribution of fish and fishery products carried out in a manner which will maintain the nutritional value, quality and safety of the products, reduce waste and minimise negative impacts on the environment.

6.3.2 Consultation, roles and responsibilities

The fishery's management system is framed by UK and English legislation, applied through the MMO¹³ and locally by the Cornwall IFCA (CIFCA)¹⁴.

IFCAs are ran by the County Councils (here, Cornwall Council - CC), according to a publicly available constitution¹⁵. There are 21 CIFCA members, of which 7 are appointed by the Council (to cover the diversity of political affiliations of elected members), 12 by the MMO to cover a range of stakeholders with local expertise including 1 from the MMO, and 1 from Natural England and 1 from the Environment Agency. The CIFCA quarterly meetings are open to the public, CIFCA members may also be contacted directly, and questions from the public are regularly put to the CIFCA and allocated 15 minutes at the beginning of each meeting. The meeting may be followed remotely, and minutes are available from the CC website¹⁶.

Key institutions taking part in the management of the fishery are listed in **Table 32**. Since 1st January 2021, European institutions are no longer directly involved. Other than through the TCA and some elements of EU legislation that may still apply, for UK vessels operating in EU waters (not this fishery) or for EU vessels exploiting a shared stock in UK waters (possible for the target stock). Other than this, the institutions and management partners remain the same as pre-Brexit and have now been working together for at least a decade and two MSC certification cycles.

Table 32. Institutions and stakeholder groups involved in the management of subarea 7 sardine coastal purse seine fishery (post Brexit).

	Name	Role
DEFRA	Department for Environment, Food and Rural Affairs	Ministerial administration
MMO	Marine Management Organisation	Licensing (UKSIA), data collection, quota management, MCS of fishing activities
UKSIA	UK's Single Issuing Authority (UKSIA)	UKSIA manages UK domestic fishing vessel access to non-UK waters and foreign vessel access to UK waters.

¹³ <https://www.gov.uk/topic/environmental-management/marine>

¹⁴ <https://www.cornwall-ifca.gov.uk>

¹⁵ see <https://democracy.cornwall.gov.uk/mgCommitteeDetails.aspx?ID=801>

¹⁶ see <https://democracy.cornwall.gov.uk/ieListMeetings.aspx?CommitteeId=801>

	Name	Role
Cornwall IFCA	Inshore Fisheries Conservation Authority	Management, MCS, Science
ICES	International Council for the Exploration of the Sea	Science (Principles 1 and 2)
Cefas	Centre for Environment, Fisheries and Aquaculture Science	Science (Principles 1 and 2)
SMRU	Sea Mammal Research Unit	Science (Bycatch monitoring)
CSMA	Cornish Sardine Management Association	Code of Conducts, shared best practice
NE	Natural England (Nature Conservation Agency)	Inshore habitat and species protection, to 12nm
EA	Environmental Agency	Inland and inshore Water Quality (to 1nm, 12nm for chemical status) and quantity, salmonid habitats and ecosystems
CWT	Cornwall Wildlife Trust - Environmental NGO	Nature and wildlife protection (marine wildlife and habitats, marine mammals' sightings and strandings)

The Cornish Sardine Management Association (CSMA¹⁷) is the CIFCA's co-management partner for this fishery. Its membership includes fishermen and processors with both sustainability and product quality and marketing objectives.

At international level post-Brexit, the UK continues its national membership to Conventions such as OSPAR, CITES, ASCOBANS (see Principle 2 section) managed through DEFRA. UK scientists from CEFAS (Principles 1 and 2) and SMRU (Principle 2) in particular, provide scientific advice and ICES brings together scientific data, stock assessment and marine ecology expertise across the North Atlantic. All these provide regular opportunities for stakeholders to meet, be informed and contribute to a shared understanding.

6.3.3 Long term objectives

The European Common Fisheries Policy (CFP) does not apply in the UK since 1st January 2021. Long-term fisheries management objectives for shared stocks have been integrated to the TCA Fishery (see UK-EU (2020)), pledging to apply “the precautionary approach to fisheries management” and “exploit shared stocks at rates intended to maintain and progressively restore populations of harvested species above biomass levels that can produce the maximum sustainable yield”. Clear and specific long-term objectives are also set out in the UK Marine Strategy for marine birds, marine mammals and benthic habitats (DEFRA 2019).

The UK Fisheries Act (UK 2020) has established a number of common objectives that all UK Fisheries Administrations are committed to supporting and delivering:

- The sustainability objective

¹⁷ <http://www.cornishsardines.org.uk/>

- The precautionary objective
- The ecosystem objective
- The scientific evidence objective
- The bycatch objective
- The equal access objective
- The national benefit objective, and
- The climate change objective.

The UK Fisheries Act also provides for Fisheries Management Plans, which will detail the steps the UKFAs will take to recover and/or maintain stocks at sustainable levels.

6.3.4 Fishery specific objectives

The national IFCA policy is “to lead, champion and manage a sustainable environment and inshore fisheries ... to ensure healthy and sustainable fisheries, by successfully securing the right balance between social, environmental and economic benefits to ensure healthy seas, sustainable fisheries and a viable industry.” More specifically, “IFCAs are bound to report on the sustainable exploitation of sea fisheries and deliver marine environmental protection within their districts.”

According to its 5-year Plan, the CIFCA “identifies issues likely to affect sustainable management of the marine environment in its District, undertakes risk assessment and gap analysis, reviews appropriateness of existing measures, and evaluates management options and develops and implements proportionate marine management solutions”, and develops “Fisheries Management Plans for priority species where appropriate”. This has not yet been done for the fishery, which is in good health and is co-managed with the CSMA through a range of measures, including vessel and gear specifications and closed areas.

The recent re-definition of the stock boundaries in 2017 has complicated (see ICES (2021a)), and simplified the stock assessment exercise at the same time. A fishery-specific objective for the stock has now been defined for Principle 1 (see sections 6.1). Regarding Principle 2, long-term objectives have been set through the UK - English policies translated locally by the CIFCA. However, the fishery is monitored regularly by on-board observers since 2018 (apart from COVID-linked restrictions, see SMRU in Principle 2 section) and seen as low risk. There are no allowances for potential impacts on marine mammals in the UK legislation for this fishery, and therefore the objective is for zero impacts. The emphasis has been placed on early reporting and warning, for example in the event of interactions with marine mammals (see Principle 2 section).

6.3.5 Decision making processes

The CIFCA-CSMA co-management system is currently based on the CSMA Code of Conduct, with no fishery-specific CIFCA bylaw. This followed a survey of CSMA members and statement by CIFCA’s principal Enforcement Officer at the time that “Cornwall IFCA will remain involved with the CSMA and offer advice to its membership, as appropriate. The CSMA was made aware of Cornwall IFCA’s statutory duty to manage fisheries within its district and that management of ring-net fisheries through a Cornwall IFCA bylaw is an available option, should the code of conduct and any other voluntary measures turn out to not deliver appropriate or sufficient fishing controls.” The

recommendation that a byelaw was not needed was adopted by the Authority at the time and still stands¹⁸.

Decisions for the fishery are taken by the CIFCA, mostly on the basis of recommendations by the CSMA, who make internal decisions, such as on the maximum length of a vessel or the maximum number of vessels (CSMA 2017 AGM minutes and Code of Conduct, G. Caslake pers. comm.).

For both CSMA and the CIFCA, the decision-making processes are based on discussions and common agreement. The CIFCA, and Cornwall Council in its hosting and financing capacity, have clear policies regarding the conduct of meetings. Records of CIFCA meetings are publicly available, including the papers submitted for discussion and the decisions made. All key stakeholders sit on the CIFCA and generally meetings and documents are available to the public. Therefore, all interested stakeholders are informed.

Although disputes could arise, such as between recreational anglers and commercial handliners in the past, both the CIFCA and the CSMA are bound to act proactively to avoid them, which from CIFCA Chief Officer's reports, has been successful in recent years (CSMA 2020c).

6.3.6 Compliance and enforcement

The CIFCA is in charge of compliance inside the 6 nm. The CIFCA operates 4 vessels, The 'Saint Piran' which is a 27 m patrol boat and acts as a mother vessel to a 6.5 m Rigid Inflatable Boat (RIB), the 'Lyonesse', 6.5m RIB, 'Avalon' operates as a standalone vessel and a survey/research boat and the 'Tiger Lilly'. CIFCA enforcement officers have nationally warranted powers clearly detailed on their website¹⁹. The CIFCA Compliance Strategy²⁰ details the gradual steps and sanctions, from verbal warning to advisory letter, official written warning, caution, financial administrative penalty, and prosecution, that may be followed and eventually may lead to a court conviction and sentencing. These are also followed by the MMO who is in charge of compliance outside 6 nm. The CIFCA publishes an Annual Enforcement Plan, and the Chief Officer Report to the Authority has a section from the Principal Enforcement Officer, which gives a detailed review of Monitoring, Control and Surveillance (MSC) activities as well as of investigations and prosecution cases and their outcomes. The CIFCA uses a risk-based assessment to plan their enforcement activities. For the fishery, there remains a moderate risk identified in the 2019-20 report for prohibited catches of seabass. Presently, the main compliance risk for the UoA vessels concerns the incidental catch and reporting of mackerel, which must not make up more than 15% of the total landed weight. The compliance risk linked to accidental catches of bluefin tuna noted in the third year surveillance report has changed since Brexit, now that the UK has a national quota. Some of the UK quota is used for this fishery to allow up to 1 fish landed per vessel per trip (see 2021 licence variation²¹). Interviews with and information communicated by the MMO Principal Officer SW and the CIFCA Principal Enforcement Officer confirmed that there was no systematic non-compliance in the fishery.

The CSMA has put in place additional reporting requirements for its member vessels, in particular regarding interactions with ETP species (see Principle 2 section). Compliance with these is good, with an increasing number of vessels participating.

¹⁸ https://www.cornwall-ifca.gov.uk/Byelaws_Regulations

¹⁹ <https://www.cornwall-ifca.gov.uk/Enforcement>

²⁰ <https://secure.toolkitfiles.co.uk/clients/17099/sitedata/Policy/Compliance-strategy.pdf>

²¹ <https://www.gov.uk/guidance/bluefin-tuna-in-the-uk>

6.3.7 Management performance evaluation

IFCAs, including the Cornwall IFCA, have to present annual work plans and report on them annually, using predetermined indicators of activities or impact (success criteria). Progress is also presented quarterly to the Authority meetings in the Chief Officer's report. All reports are publicly available on the CIFCA's website²². Although the Authority's membership is diverse, including elected councillors, MMO, Natural England and Environment Agency representatives, as well as MMO appointees across a range of stakeholders, these would qualify as internal reviews.

In addition, Defra conducts an external evaluation every four years as per the requirements of the Marine and Coastal Access Act 2009 (UK (2009): section 183 (1)). The first one, published in 2015, led to a review of the initial performance criteria, with new High-Level Objectives in the IFCA Vision and Success Criteria. The most recent second review included a 5 week long public consultation / evidence collection period (DEFRA 2018). The evaluation is across all 10 English IFCAs and is based on an analysis of each IFCA's self-evaluations, inputs from the public consultation, and a comparison of against the IFCAs duties defined in the legislation. This qualifies as a regular external review.

²² <https://www.cornwall-ifca.gov.uk/Publications>

6.3.8 Principle 3 Performance Indicator scores and rationales

Scoring table 21. PI 3.1.1 – Legal and/or customary framework

PI 3.1.1	The management system exists within an appropriate legal and/or customary framework which ensures that it: Is capable of delivering sustainability in the UoA(s); Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and Incorporates an appropriate dispute resolution framework		
Scoring Issue	SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management		
Guide post	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
Met?	Yes	Yes	Yes

Rationale

The Marine and Coastal Access Act 2009 reformed fisheries management in England, introducing the Marine Management Organisation (MMO), which is also UK's Single Issuing Authority (UKSIA) for fishing licences, in charge of fishing rights, the recording and monitoring of fishing activities; and the Inshore Fisheries Conservation Authorities (IFCAs) in charge of managing activities in coastal waters to 6 nautical miles. The fishery takes place in territorial waters and is managed by the Cornwall Inshore Fisheries Conservation Authority (CIFCA) who also has research, monitoring, control and surveillance (MCS) powers to deliver management consistent with MSC Principles 1 and 2 (UK (2009): Part 6), **SG60 is met**. The CIFCA is tasked to deliver management outcomes consistent with MSC Principle 1 and Principle 2, for the target stock and a range of other target species commercially fished inside 6nm, and through the IFCAs' responsibility for Marine Conservation Zones (MCZ) and any other protected area and species in its waters. The mechanisms are simpler and their organisation is imbedded in the CIFCA missions and its membership, which includes local government elected councillors, representatives from the Marine Management Organisation (MMO), Natural England (NE) and the Environment Agency (EA) and well as local experts from the fishing industry, recreational anglers and environmental NGOs brought together in a co-management forum (UK 2009). Cooperation is organised and effective, **SG80 is met**. For the national legal system, procedures governing cooperation with other parties are binding and deliver management outcomes consistent with MSC Principles 1 and 2. For the UK level, **SG100 is also met**.

As the UK left the EU formally on 1st January 2021, the mechanisms for organised and effective cooperation with the EU regarding this fishery, a non-quota species inside territorial waters, have been conserved. EU institutions are still involved to the extent that the (non-EU quota) stock is occasionally caught by EU-registered vessels in other fisheries targeting other small pelagic stocks, in 7e. Procedures governing the cooperation between the UK and the EU are embedded in the Trade and Cooperation Agreement (TCA) for Principle 1, and for Principle 2 impacts remain as before through OSPAR and other international agreed conventions. They are all binding, **SG100 is met**.

b	Resolution of disputes			
	Guide post	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective .
	Met?	Yes	Yes	No

Rationale

The fishery has not been the subject of legal disputes in recent history. Were any to arise, the English management system for inshore fisheries provides a transparent mechanism to discuss decisions to be taken by the IFCA, through the participation of at least one fishermen's representative on the Authority and its bylaws drafting group, through systematic consultation prior to new bylaws and national legislation or Codes of Practice, and with an IFCA and MMO representative participation in CSMA meetings, **SG60 is met**. The CIFCA has mechanisms in place to deal with disputes, detailed in their "Compliments, comments and complaints" Policy (CIFCA 2019a), which explains clearly the recourse possible and provides contact details. The absence of disputes is taken as an indicator that the mechanisms are effective, and this was confirmed at the site visit, **SG80 is met**. At local level, these have been tested in other fisheries, but not at the new EU-UK level if there was to be a dispute, **SG100 is not met**.

c	Respect for rights			
	Guide post	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Yes	Yes	No

Rationale

Locally, the management system, through the MMO and the CIFCA, recognises and respects the historical rights of local vessels, which are self-regulating through the CSMA in terms of number of active vessels, and regarding the quantities (and quality) of sardines caught and those that may be (rarely) slipped (discarded) (Principle 1); and regarding any potential impacts of the fisheries on other species, benthic habitats, ETP species and the ecosystem (Principle 2), in compliance with UK legislation. **SG60 and SG80 are met.**

Brexit has imposed a re-examination of fishing rights for many UK fisheries, with new conditions to frame access by EU vessels to the UK waters. Presently, this only concerns demersal fisheries in ICES divisions 7d-g for access between 6-12nm (see (UK-EU 2020): Annexes FISH 1-4) and therefore not this fishery. However, potentially, a share of the subarea 7 sardine stock could be attributed to EU vessels with track records, but the matter of non-quota stocks, including the target stock, has not been resolved yet (March 2022). Until a formal agreement exists, **SG100 is not met.**

References

CSMA meeting minutes

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Overall Performance Indicator score	85
Condition number (if relevant)	N/A

Scoring table 22. PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2	The management system has effective consultation processes that are open to interested and affected parties		
	The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue	SG 60	SG 80	SG 100
a	Roles and responsibilities		
Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood .	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
Met?	Yes	Yes	No

Rationale

The CIFCA and MMO have a legal and explicitly defined mandates to manage the fishery (UK 2009), through a co-management arrangement with the local producers and buyers, members of the Cornwall Sardine Management Association (CSMA). The fishery takes place inside 6 nm territorial waters off the Cornish coast. This is a typical small-scale local fishery, responsibilities, individuals and organisations involved are well known and understood, **SG60 and SG80 are met**. The TCA Specialised Committee on Fisheries (SCF) is tasked to monitor its implementation and functioning and the MMO is a member. The Committee has only met twice in 2021, and non-EU quota species have not been on its agenda, therefore it is not yet clear if the SCF will have a role, **SG100 is not met**.

b	Consultation processes		
Guide post	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used .

	Met?	Yes	Yes	Yes
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Rationale

The CIFCA, MMO, and scientists from Cefas and SMRU take part in CSMA meetings, which facilitates the presentation and sharing of scientific information upon which management decisions are based. The CSMA meets at least once a year for the Annual General Meetings (AGM), minutes and presentations of recent meetings are not public, but copies have been provided and have been communicated to the team, **SG60 and SG80 are met**. The CIFCA membership includes the fishery's key stakeholders, and has a mechanism of public consultation in place, which accepts questions throughout the year. The questions are examined by CIFCA officers and responses provided and presented to its membership at each quarterly meeting (CIFCA website). The responses are detailed and explanatory, **SG100 is met**.

c	Participation			
	Guide post		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		Yes	Yes

Rationale

The CIFCA consultation process is exemplary. Meetings are public, meeting minutes, including questions received from members of the public and stakeholders are published with any answers provided by the CIFCA officers. They are discussed at the start of each CIFCA quarterly meeting, during which CIFCA scientists and CIFCA enforcement officers present their programmes, methods, activities, and result (see CIFCA website for publications). The Authority's wide membership facilitates and encourages an effective engagement of all concerned, **SG80 and SG100 are met**.

References

UK, 2009. Marine and Coastal Access Act 2009 Available from: <https://www.legislation.gov.uk/ukpga/2009/23/contents>

CIFCA website for reports: <https://www.cornwall-ifca.gov.uk/Publications>

Overall Performance Indicator score	95
Condition number (if relevant)	N/A

Scoring table 23. PI 3.1.3 – Long term objectives

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach		
Scoring Issue	SG 60	SG 80	SG 100
a	Objectives		
Guide post	Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are implicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are explicit within and required by management policy.
Met?	Yes	Yes	Yes

Rationale

IFCAs have been set up to manage fisheries in their district (out to 6 nm) with clear and explicit long-term objectives given in the Marine and Coastal Access Act of 2009 (UK 2009) and the Conservation of Habitats and Species Regulations 2017 (UK 2017) with modifications following the EU exit (UK 2019). These extend to both Principles 1 and 2 ("Living within environmental limits: IFCAs use evidence based and appropriate measures to manage the sustainable exploitation of sea fisheries resources and deliver marine environmental protection within their district"). **SG60 and SG80 are met.** These objectives are required of each IFCA, and are explicit in the Cornwall IFCA Constitution (CIFCA 2019b), **SG100 is met.**

References

CIFCA, 2019b. Cornwall Inshore Fisheries and Conservation Authority Constitution.

UK, 2009. Marine and Coastal Access Act 2009 Available from: <https://www.legislation.gov.uk/ukpga/2009/23/contents>

UK, 2017. The Conservation of Habitats and Species Regulations 2017, Statutory Instrument No.1012. <https://www.legislation.gov.uk/uksi/2017/1012/data.pdf>

UK, 2019. The Conservation of Habitats and Species Regulations (Amendment) (EU Exit) 2019, Statutory Instrument No.579. Exiting the European Union - Wildlife. Available at <https://www.legislation.gov.uk/uksi/2019/579/made/data.pdf>

Overall Performance Indicator score	100
Condition number (if relevant)	N/A

Scoring table 24. PI 3.2.1 – Fishery-specific objectives

PI 3.2.1		The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Objectives , which are broadly consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are implicit within the fishery-specific management system.	Short and long-term objectives , which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery-specific management system.	Well defined and measurable short and long-term objectives , which are demonstrably consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery-specific management system.
	Met?	Yes	Yes	No

Rationale

The CSMA Harvest Strategy has three long-term sustainability objectives for the fishery: 1) Maintain good and adaptive management procedures that utilise a precautionary approach towards the long-term sustainability of the fishery, based on the biological and population characteristics of the species (Principle 1); 2) Environmental objective: To minimise the impact of fishing activity on the marine environment. Maintain an effective code of conduct for all CSMA members (Principle 2); and 3) Economic objective: Maintain stability to the resource in such a way as to ensure its economic sustainability and ongoing benefit to the Cornish, Plymouth community and CSMA members, **SG60 is met**. Short-term objectives corresponding to both Principles 1 and 2 outcomes are also dictated by the CIFCA Constitution (CIFCA 2019b). In addition, for the target stock the short-term objective is explicit and well-defined for the fishery specifically, on the basis of CEFAS latest stock assessment, surveys and interpretation of the latest ICES Working Group report, to maintain the fishing mortality rate F below F_{MSY} , and to ensure that the biomass would not approach the point of recruitment impairment (see Principle 1 section on the Harvest Strategy). The TCA fisheries committee has not yet agreed specific catch shares of non-quota species for EU vessels, including for the subdivision 7 sardine stock. Until this is done, the CSMA is fixing explicit its annual short-term objective based on CEFAS scientific advice for the target stock in line with the MSY long-term objective (Principle 1), **SG80 is met**. The present limitations of the ICES models, which have suffered from a high variability in catches in recent years; due to a combination of the COVID-19 and Brexit, produce short-term objectives that are not well-defined. For Principle 1, **SG100 is not met**.

Regarding Principle 2, short and long-term objectives are defined explicitly through the various CIFCA bylaws, Marine Conservation Zones (MCZ) and nature conservation obligations monitored by the MMO and the CIFCA, regarding potential bycatch (especially mackerel), interactions with protected species (birds, marine mammals) and habitat impacts (see CIFCA website). **SG60 and SG80 are met**. Not all Principle 2 objectives are well-defined **SG100 is not met**.

References

CIFCA website for bylaws: https://www.cornwall-ifca.gov.uk/Byelaws_Regulations

CIFCA, 2019b. Cornwall Inshore Fisheries and Conservation Authority Constitution.

UK, 2009. Marine and Coastal Access Act 2009 Available from: <https://www.legislation.gov.uk/ukpga/2009/23/contents>

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Appendix 11 – CSMA documents

Appendix4 -MMO, CEFAS and Cornwall IFCA

Overall Performance Indicator score	80
Condition number (if relevant)	N/A

Scoring table 25. PI 3.2.2 – Decision-making processes

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery		
Scoring Issue		SG 60	SG 80	SG 100
a	Decision-making processes			
	Guide post	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Yes	Yes	

Rationale

There are clear decision-making processes in place, defined in the Marine and Coastal Access Act (UK 2009) and specifically for the CIFCA (UK 2010a). The CIFCA decision-making processes are established and matters relating to the fishery are discussed in CIFCA's Chief Officer's report to the Authority, including the Enforcement Officer's report (see CIFCA's website). The CSMA holds an annual AGM, and meetings where decisions are made with a voting system. The co-management system operating in the fishery means that the CIFCA and MMO intervene to support CSMA, via attendance to its meetings, and by regularly evaluating a possible need (or not) for a more formal regulation of the fishery, **SG60 and SG80 are met.**

b	Responsiveness of decision-making processes			
	Guide post	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Yes	Yes	Yes

Rationale

The CSMA Code of Conduct is examined at least once a year, and modified in response to new developments in the fishery's management, such as in 2018 after the ICES changes the target stock boundaries definition and specific scientific advice was needed (see (Jones et al. 2018)). Other serious and important issues include minimising the risk of slippage, and avoiding impacts on marine mammals, for which the CSMA has organised a voluntary on-board observer program and CCTV (see Principle 2 section), **SG60 and SG80 are met**. One of the clear indicators that the CIFCA-CSMA co-management system is effective is that there are no specific bylaws to regulate the fishery further, a matter that is monitored and analysed by the CIFCA at least on an annual basis (see CIFCA website). The team is confident that all issues identified through the co-management process are addressed in a timely fashion, **SG100 is met**.

c	Use of precautionary approach			
	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Yes	

Rationale

A precautionary approach is demanded at all levels of management advice and management decisions, from the TCA (UK-EU 2020), which governs the fisheries management cooperation between the EU and the UK for shared stock such as this fishery's target subarea 7 sardine stock, through to the UK Fisheries Act (UK 2020). These obligations filter right through the management decision for local inshore fisheries, and the current scientific management advice provides by ICES, on the basis of the PELTIC surveys and research conducted by Cefas (see Principle 1 section), **SG80 is met**.

d	Accountability and transparency of management system and decision-making process			
	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	Information on the fishery's performance and management action is available on request , and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Yes	Yes	Yes

Rationale

The CIFCA operates on the basis of corporate annual plans and reports that monitor and evaluate performances of management actions and describes how the management system responded to findings and to relevant recommendations emerging from research, monitoring, evaluation and review activity on a regular basis. All reports are publicly available to all interested stakeholders, **SG60, SG80 and SG100 are met** (cf. CIFCA website for reports).

e	Approach to disputes			
	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Yes	Yes	Yes

Rationale

Although disputes could arise, such as between recreational anglers and commercial hand-liners in the past (CSMA 2020c), both the CIFCA and the CSMA are bound to act proactively to avoid them, **SG60 and SG80 are met**. The latest CIFCA Chief Officer's reports (see CIFCA website for reports) mentions a new WhatsApp group between CSMA member vessel skippers and the bass fishers, as a new development, and recent CIFCA Enforcement reports do not make mention of legal disputes. Recent CIFCA Enforcement reports do not make mention of legal disputes, which was confirmed during the site visit, **SG100 is met**.

References

CSMA, 2020c. Meeting between members of the Southwest handline Fisherman's Association and members of the Cornish Sardine Management Association. 7th Feb 2020, CSMA.

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CIFCA website for reports: <https://www.cornwall-ifca.gov.uk/Publications>

Appendix 11 – CSMA documents

Appendix4 -MMO, CEFAS and Cornwall IFCA

Overall Performance Indicator score	100
Condition number (if relevant)	N/A

Scoring table 26. PI 3.2.3 – Compliance and enforcement

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with		
Scoring Issue	SG 60	SG 80	SG 100
a	MCS implementation		
Guide post	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
Met?	Yes	Yes	Yes

Rationale

The Marine Management Organisation (MMO) is also UK's Single Issuing Authority (UKSIA) for fishing licences, and in charge of VMS, fishing rights, the recording and monitoring of fishing activities and catches. Inside 6 nm, the CIFCA work with the MMO and is in charge of Enforcement, **SG60 is met**. The CIFCA has a comprehensive MCS system in place, with a risk-based approach to enforcement, with publicly available plans and reports of the Enforcement Officers to the CIFCA, including of infractions and sanctions, **SG80 is met**. The system is comprehensive (see annual enforcement plans reports on CIFCA's website), **SG100 is met**.

b	Sanctions		
Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
Met?	Yes	Yes	Yes

Rationale

A progressive and comprehensive range of sanctions exist, which are applied across all fisheries by the CIFCA. The CIFCA publishes an Annual Enforcement Plan, and the Chief Officer Report to the Authority has a section from the Principal Enforcement Officer, which gives a detailed review of Monitoring, Control and Surveillance (MSC) activities as well as of investigations and prosecution cases and their outcomes, **SG60 and SG80 are met**. Some risks are identified for the fishery, which concerns mostly the risk of catching too high a percentage of mackerel or prohibited seabass. There are no recent reports of this. Therefore, the CIFCA and MMO confirmed at the site visit that the system in place, of co-management and a very-well organised MCS capability and potential administrative and criminal sanctions, is effective, **SG100 is met**.

c	Compliance			
	Guide post	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Yes	Yes	No

Rationale

There has been no history of compliance issues in the fishery, according to the previous MSC audit reports. The last 4 surveillance audits have collected information directly from the CIFCA and the MMO, **SG60 and SG80 are met**. A summary from the MMO provided for the site visit noted some offences against the Control Regulation over the last three years (2019 to 2021), mostly late or non-submission of landing declarations, leading to rebriefs (6 in 2020 and 4 in 2021) and 1 official written warning in 2020. This correspond to the team's analysis of compliance with the CSMA logbook returns, which has been improving for most but not all vessels in the UoA (see Principle 2 section), **SG100 is not met**.

d	Systematic non-compliance			
	Guide post	There is no evidence of systematic non-compliance.		
	Met?	Yes		

Rationale

There has been no instances of systematic non-compliance reported for this fishery in the last 10 years, according to the MSC audit reports based on 1st hand information from MCS competent authorities, **SG80 is met**.

References

see CIFCA website for a detail of annual enforcement activities, offences and sanctions, and Enforcement Annual Plans and reports: <https://www.cornwall-ifca.gov.uk/Publications>

Appendix 4 - MMO

Overall Performance Indicator score	95
Condition number (if relevant)	N/A

Scoring table 27. PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system		
Scoring Issue	SG 60	SG 80	SG 100	
a	Evaluation coverage			
	Guide post	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system.	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
	Met?	Yes	Yes	No

Rationale

The IFCA operates with a planning, evaluation and reporting schedule through annual plans and reports that are publicly available. The Chief Officer also reports quarterly at each Authority meetings, on its work programme, outcomes and budget, which is funded by the local authority. There are detailed and clear mechanisms in place to review the key parts of its fisheries management system, **SG60 and SG80 are met**. Among all Cornwall IFCA duties the planning of activities, reporting and reviews are prioritised annually using a Risk Management Strategy. Because the purse seine sardine fishery does not present management risks, it is not mentioned in the reports, therefore although there are mechanisms in place that guide the decisions, without at least a mention of "low risk" for the fishery, **SG100 is not met**.

b	Internal and/or external review			
	Guide post	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Yes	Yes	Yes

Rationale

The fishery-specific co-management system, through CIFCA, the MMO and Natural England (for some protected areas) is reviewed annually internally. There are regular, every 4 years, external reviews by DEFRA (DEFRA 2018) , **SG60, SG60 and SG100 are met**.

References

Defra, 2018. Inshore Fisheries and Conservation Authorities, Conduct and Operation 2014-2018. Available from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/919059/ifca-conduct-operation-2014-2018.pdf

Overall Performance Indicator score	90
Condition number (if relevant)	N/A

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8 Appendices

Appendix 1 Assessment information

Appendix 1.1 Previous assessments

The CSMA Cornwall sardine fishery was first certified in June 2010 by MRAG with seven conditions. At the end of the initial certification period no conditions were evident in the fishery, and it underwent reduced recertification in March 2017. In the reassessment six conditions were placed on the fishery. Following surveillance and Principle 1 expedited audit in 2018 and change in perceived stock status from ICES, conditions on 1.2.1 and 1.2.2 were closed and reissued based on the new stock perception. The MSC Covid [derogation 6](#) from 2021 applies to all open conditions with a deadline in Year 4 of the 2nd cycle. This required the assessment team to reissue the milestones and deadlines as Year 1 in the reassessment and carry these conditions forward into the new assessment. Details of these conditions are in the table below and in section Appendix 5.2.

Table 33. Summary of previous assessment conditions

Condition	PI(s)	Year closed	Justification
The harvest strategy and harvest control rules are not fully responsive to the stock status. The main fishery on this stock is the South Brittany sardine fishery (MSC certificate number F-BV-552727-FR). The South Brittany certification was conditional on developing a responsive harvest strategy and control rule. Since the Cornish fishery takes a negligible proportion of the catch, it cannot participate directly in this activity, but the condition was to promote and support the development of the management system for the overall stock.	1.2.1	2013	This condition was met in Year 3 and CSMA have shown that they have taken pro-active measures to encourage membership, review of any stock information and liaise with policy makers to support their voluntary harvesting strategy.
The harvest strategy and harvest control rules are not fully responsive to the stock status. The main fishery on this stock is the South Brittany sardine fishery (MSC certificate number F-BV-552727-FR). The South Brittany certification was conditional on developing a responsive harvest strategy and control rule. Since the Cornish fishery takes a negligible proportion of the catch, it cannot participate directly in this activity, but the condition was to promote and support the development of the management system for the overall stock.	1.2.2	2013	This condition was met in Year 3 and CSMA have shown that they have taken pro-active measures to encourage membership, review of any stock information and liaise with policy makers to support their voluntary harvesting strategy.
The catch of non-target retained species is considered very likely to be minimal (i.e. less than the 5% threshold to be considered as 'main' retained species). However,	2.1.3	2011	This condition was met in Year 1, and CSMA have shown improved completion of log sheets and a greater representation of vessels targeting sardines.

Condition	PI(s)	Year closed	Justification
quantitative information could not be provided to demonstrate this conclusively.			Recommendation: CSMA holds a short training session for skippers on how to fully fill out the electronic log-sheets.
Discarded bycatch comes mainly via 'slippage' of the ring net catch. Documentary / quantitative evidence is lacking on frequency of slippage, species involved and discard survival.	2.2.3	2011	This condition was met in Year 1 and CSMA have continued to fulfil this condition by providing information on discards in log-sheets and improving the completion of log-sheets and representation of the association. However, the electronic log-sheets do not provide space to record the reason for slippage/discards.
The management system does not include explicit objectives.	3.2.1	2011	The fishery developed and documented fishery-specific objectives for MSC Principle 1 and MSC Principle 2 that were agreed to by all major stakeholders and consistent with UK national policy.
The decision-making process needs to be explicitly precautionary, and to incorporate the HCR (once developed under PI 1.2.2 above).	3.2.2	2013	This condition was met in Year 3, following the definition of harvest control rules for the South Brittany fishery, and continues to be met with CSMA staying informed on any new research information and continuing dialogue with CIFCA and MMO on options to formalise their own voluntary harvest control rules. Recommendation: CSMA also review any new information/results from the WGHANSA working group on the Bay of Biscay Stock; any changes in harvest strategy by the South Brittany fishery; and the latest ICES advice at their AGM. Recommendation: CSMA continue dialogue with CIFCA and MMO to formalise harvest control rules if there is evidence that the stock is under pressure.
Research on the stock is underway (e.g. surveys were under development by CEFAS during assessment) but a research plan had not been fully developed.	3.2.4	2013	This condition was met in Year 3, and CSMA have continued to pro-actively contributed their annual statistics to CEFAS, review the latest stock assessment information through CEFAS and pro-actively follow up the option to collaborate with CEFAS on a potential new research programme.
By the second surveillance audit, evidence shall demonstrate that a harvest strategy is in place and the elements of the harvest strategy work together by ensuring that total	1.2.1	2018	Closed due to change in stock status and condition now not being relevant to the new stock identity

Condition	PI(s)	Year closed	Justification
international catches of VIII/VII sardine are no higher than those advised by ICES.			
By the third surveillance audit, provide evidence that the management strategy outlined for the Spanish, French and Cornish fisheries has been implemented for the VIII/VII sardine stock, that there is well defined HCR which will reduce exploitation if there are indications that the stock is declining (as provided by ICES), such that catch levels are reduced as necessary.	1.2.2	2018	Closed due to change in stock status and condition now not being relevant to the new stock identity
By the Year 1 reassessment there should be clear evidence that the harvest strategy is responsive to the state of the stock and elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	1.2.1	open	
By the Year 1 reassessment well-defined HCRs should be in place which reduce exploitation rate as limit reference points are approached. These need to take into account the main uncertainties and be appropriate for the control of exploitation rates	1.2.2	open	
By the Year 1 reassessment Record and analyse any pinniped (seal) or seabird mortalities (specifically black-backed gulls (Larus fuscus, Larus marinus); herring gulls (Larus argentatus) & fulmars (Fulmarus glacialis)) within CSMA log-sheets.	2.3.3	open	
By the Year 1 reassessment surveillance audit, short and long-term objectives for the sardine fishery, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, need to be explicitly included in the management of the fishery. This is linked to not having a sampling programme, which prevents evaluation of the stock. The aims of the Association do not explicitly state objectives which are consistent with both MSC Principle 1 and 2.	3.2.1	open	
By the Year 1 reassessment surveillance audit, the fishery must demonstrate there are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. Annual internal meeting have not been resulting in measures and strategies to achieve the fishery-specific objectives, for	3.2.2	open	

Condition	PI(s)	Year closed	Justification
example limitation of fleet size to reduce fishing effort in relation to falling stock status.			
There shall be a research plan in place that provides the management system with a strategic approach to research and reliable and timely information, sufficient to achieve the objectives consistent with Principles 1 and 2.	3.2.4	Year 3	In 2020, the CSMA has brought together into a short formal document, the various research initiatives concerning Principles 1 and 2, as well as Principle 3 (regarding the use of onboard video cameras to facilitate reporting of interactions with ETP and bycatch) (Appendix 4.2). This constitutes a Research Plan that provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2. Progress with the condition is on target, this condition may be closed.

Appendix 1.2 Small-scale fisheries

Unit of Assessment (UoA)	Percentage of vessels with length <15m	Percentage of fishing activity completed within 12 nautical miles of shore
1	100	100

Appendix 2 Evaluation processes and techniques

Appendix 2.1 Site visits

The site visit was held in Newlyn, over two days from the 20th January 2022, with remote calls with stakeholders completed on 1st February 2022. The individuals met during the site visit and their roles in the fishery are listed in Table 34.

Table 34. List of attendees at the on-site meetings. * denotes remote attendees

Name	Position	Type of consultation
Hugh Jones	CU Team Lead and Principle 2	Assessor
Sophie des Clers*	CU Principle 3	Assessor
Martin van Brakel*	CU Principle 1	Assessor
Carley Elson*	MMO	Compliance
Julian Roberts*	MMO	Compliance
David Costalago Meruelo*	MSC	observer
Jo Pollett*	MSC	observer
Charlotte Todd	CU UK	observer
Richard Caslake	CSMA chair	Client
Allen Sealle	CEFAS / CSMA	Client group
Nick Hictell	Mayflower skipper	Client group
William Treneer	Lyonese Skipper	Client group
Tom Lambourn	Lyonese crew	Client group
Peter Bullock	Vesta skipper	Client group
Sam Lambourn	Lyonese owner	Client group
David Pascoe	Serene Dawn owner skipper	Client group
Tom Pascoe	Charlotte Clare skipper	Client group
Mark Powell	Pelagic Marksman owner skipper	Client group
Edwin Hoskin	Falfish manager	Client group
Colin Trundle	Cornwall IFCA	Compliance
Simon Cadman*	Cornwall IFCA	Compliance

Appendix 2.2 Stakeholder participation and Evaluation techniques

a) Media announcements: CU UK selected the MSC as media outlet. The MSC press release targeted a wide range of stakeholders within the sustainable seafood industry, ensuring that key stakeholders were notified of this fishery’s announcement.

b) Methodology for information gathering: Review of data and documentation, interview of stakeholders.

c) Scoring process: Scoring was agreed by the team via email correspondence. Consensus was reached for all scores.

The scores were decided as follows:

How many scoring issues met?	SG60	SG80	SG100
All	60	80	100
Half	FAIL	70	90
Less than half	FAIL	65	85
More than half	FAIL	75	95

Note that where there is only one scoring issue in the SG, the issue can be partially scored – in this case the team used their judgement to determine what proportion of it was met, e.g. at the 100 level, a small part met = 85, about half met = 90, nearly all met = 95.

d) Decision rule for reaching the final recommendation: The decision rule for MSC certification is as follows:

- No PIs scores below 60;
- The aggregate score for each Principle, rounded to the nearest whole number, is 80 or above.

The aggregate score for each Principle is the sum of the weighted score of each Performance Indicator within that Principle.

Appendix 3 Peer review reports

PRCDR stage

Peer Review 1 – General Comments

Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage).	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	Yes. The Performance Indicator scores are clearly justified and well laid out, with relevant evidence presented in well-argued detail.	Thank you
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.2, 7.18.1 and sub-clauses]	No	As explained under the relevant PI (1.2.4), it is not clear how the fishery can address the condition in the time frame, given the issue identified involves ICES assessment of the stock. The condition suggests working with Cefas, but it is not clear how that will solve the issue, unless Cefas has a direct stock-assessment relationship into the ICES process.	The peer reviewer is correct in their assumption, that CEFAS has a direct stock assessment relationship into the ICES process. CEFAS is the lead 'Member State' scientific organisation responsible for the stock. CEFAS leads the scientific survey and the stock assessment development and testing for Subarea 7 sardine. The lead researchers (Rosana Ourens, Jeroen Van Der Kooij, Richard Nash) of CEFAS were interviewed at the site visit are the named authors on the ICES research within the Bibliography and they developed the current stock assessment and HCR for the ICES working group. The HCR per se is not the issue (as identified in 1.2.2) it is the applicability of the starting point which is driven by the low catches in the reference period and constraints of the current ICES process for the 1o2 rule across Cat 3 stocks. CEFAS provided the key input and testing into the proposed HCR using the 1o2 rule and showed that the eventual formulation of the rule was inappropriate (ICES (2021f) through HR estimates. However because of the wider ICES framework for cat 3 stocks could not accommodate any of the HR estimates (they had not been previously tested by MSE by ICES in 2020) they could not be used. At interview

			CEFAS identified the key issue was the 1o2 rule starting point and there was acknowledgement that the next inter-benchmark (in 3 years' time) needs to address this issue. The associated CAP for this condition should address this issue and allow development and implementation of a suitable ICES HCR.
Is the client action plan clear and sufficient to close the conditions raised? [Reference FCR v2.0, 7.11.2-7.11.3 and sub-clauses]	N/A	N/A	N/A
Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?		NA	N/A
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary). Add extra rows if needed below, including the codes in Columns A-C.	NA	<p>This is a well presented, clearly laid out report. It was a pleasure to read, succinct and informative. The description of the fishing process is most helpful (Section 4.2.2) in that practicalities can be appreciated (good photos and helpful video link).</p> <p>The recently published Stanton 2021 study on possible impact of the fishery on seagrass is timely and informative.</p> <p>The link to the blog on EU-relations law is much appreciated and noted.</p> <p>If there is one quibble, there were quite a few typos and text-edit mismatches throughout the report, which sometimes distracted from the flow of the text. The typos aren't necessarily picked up by the software ('wise' instead of 'wide' , or 'wise' instead of 'brought'). A final read-through would be good.</p>	Apologies for the minor typos these are corrected.

P1 General		Please revisit scoring table for PI 1.2.2 - a gremlin seems to have slipped in here at scoring issue a) affecting layout of text (portrait), insert of text and inserted a whole new table on stakeholder input (Table 36)	Noted and amended. MS word hyperlinks are frustratingly full of Gremlins.
General		According to Table 7 there are several vessels below 12m, which could mean that these vessels do not need to carry VMS. Is this correct? Do the smaller vessels carry VMS too, or just AIS? This is of relevance in order to help work out the fishery footprint, unless of course the location information is clearly available from the logbooks and transcribed into the footprint maps (e.g. Fig.10)	Regarding the under 12m vessels they do not currently carry VMS and only have only AIS. As of 2022 iVMS will be introduced. Logbook records of these vessels include positional information (LAT LONGS). With regard to the fishery footprint the smaller vessels are all stationed at Newlyn and only fish within the confines of Mounts Bay therefore the overall footprint of the fishery does differ from the overall coverage provided in the maps.
General		Section 4.2.1, first para mentions a CIFCA byelaw on vessel size, but no date to the byelaw. A search did not come up with a relevant Cornish byelaw, but a similar discussion in the D&S IFCA - https://www.devonandsevernifca.gov.uk/content/download/7404/53491/version/2/file/B%26PSC+Review+of+Size+of+Vessels+Byelaw+Planning+Report+June+2021.pdf Of course this may not be the same for the Cornish IFCA, but there may be historical similarities	It is here: https://secure.toolkitfiles.co.uk/clients/17099/sitedata/Byelaws%20and%20orders/Cornwall_SFC/Purse-seine-and-ring-net.pdf and is one of the EX-CORNWALL SEA FISHERIES COMMITTEE BYELAWS

Peer Review 1 – PI comments

PI	PI Info.	PI Scoring	PI Condition	Peer Reviewer Justification	CAB Response to Peer Reviewer's comments	CAB Response Code
1.1.1	Yes	Yes	NA	Scoring agreed	N/A	N/A
1.1.2	NA (PI not scored)	NA (PI not scored)	NA	N/A	N/A	N/A
1.2.1	Yes	Yes	NA	Scoring agreed	N/A	N/A
1.2.2	Yes	Yes	NA	SI a) The layout of the Scoring table has slipped to 'Portrait', obscuring SG100 text; some text within the table is obscured by bars; a Table 32 (Stakeholder input) has slipped into SI a; the rationale text provided for SI a) needs to be edited to join up with page 65 text (top). All the information for the rationale is there but needs editing.	Edits made . MS word hyperlink issues.	Accepted (no score change, change to rationale)* *there is no other suitable MSC response code
1.2.2	Yes	Yes	NA	SI b) May I suggest a rephrasing of the following sentence (at the end of the first paragraph): " <i>The '1-over-2' rule in place from ICES is not considered inappropriate because of uncertainty but because of the method of application (see SIa)</i> " to: "The 1-over-2 rule in place from ICES is considered inappropriate not because of uncertainty, but because of the method of application (see SI a)" - if this is what the assessor meant to convey - just moving the 'not'	Thank you yes much better	Accepted (no score change, change to rationale)

PI	PI Info.	PI Scoring	PI Condition	Peer Reviewer Justification	CAB Response to Peer Reviewer's comments	CAB Response Code
1.2.3	Yes	Yes	NA	N/A	N/A	N/A
1.2.4	Yes	Yes	No	Regarding condition: from the justification it appears that the problem in SI a) seems to lie with ICES? The team seems to say that the current CMSA HCR as applied is appropriate for the stock, but because ICES advice is based on an inappropriate harvest rate calculation, the 1over2 rule ICES use is not appropriate. In other words, there is concern (raised by ICES and industry) on the appropriateness of the assessment for the ICES HCR. It therefore seems that this is an issue ICES has to grapple with. So how does this condition feed into this ICES process? Via Cefas? My concern is that the condition needs to be close-able by the client - which in this case means working with Cefas/ICES to come up with an appropriate HCR based on the assessment.	The peer reviewer is correct in their assumption, that CEFAS has a direct stock assessment relationship into the ICES process. CEFAS is the lead 'Member State' scientific organisation responsible for the stock. CEFAS leads the scientific survey and the stock assessment development and testing for Subarea 7 sardine. The lead researchers (Rosana Ourens, Jeroen Van Der Kooij, Richard Nash) of CEFAS were interviewed at the site visit are the named authors on the ICES research within the Bibliography and they developed the current stock assessment and HCR for the ICES working group. The HCR per se is not the issue (as identified in 1.2.2) it is the applicability of the starting point which is driven by the low catches in the reference period and constraints of the current ICES process for the 1o2 rule across Cat 3 stocks. CEFAS had the key input and testing into the proposed HCR using the 1o2 rule and showed that the eventual formulation of the rule was inappropriate (ICES (2021f) through HR estimates. However because of the wider ICES framework for cat 3 stocks	Accepted (no score change, additional evidence presented)

PI	PI Info.	PI Scoring	PI Condition	Peer Reviewer Justification	CAB Response to Peer Reviewer's comments	CAB Response Code
					could not accommodate any of the HR estimates (they had not been previously tested by MSE by ICES in 2020) they could not be used. At interview CEFAS identified the key issue was the 1o2 rule starting point and there was acknowledgement that the next inter-benchmark (3 years' time) needs to address this issue. The associated CAP for this condition should address this issue and allow development and implementation of a suitable ICES HCR.	
2.1.1	Yes	Yes	NA	Scoring agreed	N/A	N/A
2.1.2	Yes	Yes	NA	Scoring agreed	N/A	N/A
2.1.3	Yes	Yes	NA	Scoring agreed	N/A	N/A
2.2.1	Yes	Yes	NA	SI b) For completeness and transparency of scoring calculation, it would be good to state in the justification that as there are no main Secondary species, SG60/SG80 is met automatically; one can also apply the 'all-or-none' at SG100 interpretation here: https://mscportal.force.com/interpret/s/article/Minor-species-and-scoring-element-approach-at-SG100-7-10-7-1527586956233	SIb only has SG100 scoring guidepost so SG60 and SG80 are not relevant to this SI. However the all or nothing approach is a good addition to this rationale and has been completed.	Accepted (no score change, additional evidence presented)
2.2.2	Yes	Yes	NA	Scoring agreed	N/A	N/A
2.2.3	Yes	Yes	NA	Scoring agreed	N/A	N/A
2.3.1	Yes	Yes	NA	Scoring agreed	N/A	N/A

PI	PI Info.	PI Scoring	PI Condition	Peer Reviewer Justification	CAB Response to Peer Reviewer's comments	CAB Response Code
2.3.2	Yes	Yes	NA	Scoring agreed	N/A	N/A
2.3.3	Yes	Yes	NA	Scoring agreed	N/A	N/A
2.4.1	Yes	Yes	NA	Scoring agreed	N/A	N/A
2.4.2	Yes	Yes	NA	Scoring agreed	N/A	N/A
2.4.3	Yes	Yes	NA	Regarding the Kaiser et al reference which was given as n.d. in SI a) justification (assume this means 'no date'? It was published in 2018	Thank you, reference DB updated.	Accepted (no score change, change to rationale)
2.5.1	Yes	Yes	NA	Scoring agreed	N/A	N/A
2.5.2	Yes	Yes	NA	Scoring agreed	N/A	N/A
2.5.3	Yes	Yes	NA	Scoring agreed	N/A	N/A
3.1.1	Yes	Yes	NA	Scoring agreed	N/A	N/A
3.1.2	Yes	Yes	NA	Scoring agreed	N/A	N/A
3.1.3	Yes	Yes	NA	Scoring agreed	N/A	N/A
3.2.1	Yes	Yes	NA	Scoring agreed	N/A	N/A
3.2.2	Yes	Yes	NA	Scoring agreed	N/A	N/A
3.2.3	Yes	Yes	NA	Scoring agreed	N/A	N/A
3.2.4	Yes	Yes	NA	Scoring agreed	N/A	N/A

Peer Review 2 – General Comments

Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage).	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	In general, the scoring is consistent with the MSC standards, and backed by relevant information. My comments reflect areas where I have some concerns with scoring and feel they could be clarified, but in general, the report presents ample information and evidence to support its conclusions.	Thank you please see individual PI responses.
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe?	Yes	Yes, the approach proposed in the condition to transition from ICES advice to one more suited to the fishery and the catches which are being taken is proportionate, clearly written, and should lead to the SG80 outcome over the specified timescale.	Thank you
Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?	NA	Not an enhanced fishery.	N/A
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary). Add extra rows if needed below, including the codes in Columns A-C.	NA	"I am confused by the differences between tables 8 (Sardine in Subarea 7. History of reported landings; values are presented for each country participating in the fishery) and 11 (Revised sardine landings (tons) reported by country for 2021 ICES advice). It is hard to understand exactly why this difference is there - maybe the caption for figure 11 could be expanded to make what is being shown clearer. Table 12 then runs in the opposite direction to the others, with most recent year at the top. Otherwise the report is very well written, and the background information is extensive. I particularly appreciated the hyperlinks to documents."	This is a good point, the tables are essentially a repeat of each other but table 11 is a slightly updated version which became available between the time of the ACDR drafting and the site visit. In the PCDR, table 8 has been replaced by table 11 and table 11 removed entirely.

Peer Review 2 – PI comments

PI	PI Info	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
1.1.1	Yes	Yes	NA	Scoring agreed.	N/A	N/A
1.1.2	Yes	Yes	NA	Scoring agreed.	N/A	N/A
1.2.1	No (material score reduction expected to <80)	No (material score reduction expected to <80)	NA	<p>I note that in lieu of internationally agreed catch limits, fishers have entered into a voluntary arrangement to manage catches. My understanding is that the harvest strategy is then dependent on the CSMA members voting to accept the proposed TAC on an annual basis. I cannot find any reference to what should happen under the strategy should the vote be to not accept the recommended catch limit. To my mind, this could lead to catches in excess of sustainable levels entering the supply chain. This feels a slightly risky oversight, and I believe further consideration of the implications of this voting scenario for the harvest strategy as a whole are required, particularly with regard to scoring of 1.2.1a and 1.2.1b.</p>	<p>Thanks for the comment. Prior to 2022 this may have been a risk despite the CSMA's agreed process for CEFAS to have oversight on the HCR. However this potential issue was closed in the CSMA HCR in 2022 by adding in the direct ability of CEFAS to overrule a CSMA catch limit if it was going to impact the stock in relation to MSY or PRI. This is detailed in section 6.1.6.3 of the report and in the rationale of PI 1.2.1a.</p> <p>For ease the relevant section is reproduced below and the assessment team considers this risk now suitably addressed:</p> <p>3. Cefas will evaluate if the proposed catch limit meets the following points:</p> <p>i. The catch limit likely maintains the overall exploitation rate below F_{MSY}; and</p> <p>ii. not likely leads to an overall exploitation rate that would reduce biomass to approach the point of recruitment impairment.</p> <p>a. If Cefas agree that the CSMA proposed catch limit as laid out under Point 3. i-ii are met, then then the proposed harvest rate will be offered to members for acceptance as the CMSA catch limit for the forthcoming calendar year.</p> <p>b. If Cefas consider that the CSMA proposed catch limit as laid out under Point 3. i-ii are not met, then CSMA will adopt a catch level advised by Cefas which ensures that</p>	Not accepted (no change)

PI	PI Info	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
					<p>Point 3 i-ii is met or will follow the ICES HCR, whichever is higher.</p> <p>The only addition consideration is #4 in the HCR which limits the reduction of the catch allowance to 10% of the previous year's catch limit to maintain the economic objective.</p>	
1.2.2	Yes	Yes	NA	Scoring agreed.	N/A	N/A
1.2.3	Yes	Yes	NA	Scoring agreed.	N/A	N/A
1.2.4	Yes	Yes	Yes	<p>Scoring agreed. The issue with the assessment here is not that it fails to follow stock status, but rather that the way it is being used by ICES to provide advice is inappropriate. I am not sure it is within the gift of the CSMA or Cefas to change the ICES advice rules, however the rationale given for why following the current rules can lead to advice which is excessively precautionary is well explained, and the alternative steps laid out in this condition, if followed, will lead to a robust and responsible translation from observation to management, and justify the award of SG80 for this PI.</p>	<p>Thank you, this is the correct interpretation of the issue. The HCR per se is not the issue (as identified in PI1.2.2) it is the applicability of the starting point of the HCR which is driven by the low catches in the reference period and constraints of the current ICES process for the 1o2 rule across Cat 3 stocks. CEFAS had the key input and testing into the proposed HCR using the 1o2 rule and showed that the eventual formulation of the rule was inappropriate (ICES (2021f) through HR estimates. However because the wider ICES framework for cat 3 stocks could not accommodate any of the HR estimates (because they had not been previously tested by MSE by ICES in 2020) they could not be used. At interview CEFAS identified this key issue and there was acknowledgement from CEFAS that the next inter-benchmark (3 years' time) needs to address this issue. The associated CAP for this condition should address this issue and allow development and implementation of a suitable ICES HCR.</p> <p>In terms of the condition and the influence of CEFAS. CEFAS has a direct stock assessment relationship into the ICES process. CEFAS is the lead 'Member State' scientific organisation responsible for the stock. CEFAS leads the scientific survey and the stock assessment development</p>	NA (No response needed)

PI	PI Info	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
					and testing for Subarea 7 sardine. The lead researchers (Rosana Ourens, Jeroen Van Der Kooij, Richard Nash) of CEFAS were interviewed at the site visit are the named authors on the ICES research within the Bibliography and they developed the current stock assessment and HCR for the ICES working group. The HCR per se is not the issue (as identified in 1.2.2) it is the applicability of the starting point which is driven by the low catches in the reference period and constraints of the current ICES process for the 1o2 rule across Cat 3 stocks. CEFAS had the key input and testing into the proposed HCR using the 1o2 rule and showed that the eventual formulation of the rule was inappropriate (ICES (2021f) through HR estimates. However because of the wider ICES framework for cat 3 stocks could not accommodate any of the HR estimates (they had not been previously tested by MSE by ICES in 2020) they could not be used. At interview CEFAS identified the key issue was the 1o2 rule starting point and there was acknowledgement that the next interbenchmark (3 years' time) needs to address this issue. The associated CAP for this condition should address this issue and allow development and implementation of a suitable ICES HCR.	
2.1.1	Yes	Yes	NA	Scoring agreed.	N/A	N/A
2.1.2	Yes	Yes	NA	Scoring agreed.	N/A	N/A
2.1.3	Yes	Yes	NA	Scoring agreed.	N/A	N/A
2.2.1	Yes	Yes	NA	Scoring agreed.	N/A	N/A
2.2.2	Yes	Yes	NA	Scoring agreed.	N/A	N/A
2.2.3	Yes	Yes	NA	Scoring agreed.	N/A	N/A
2.3.1	Yes	Yes	NA	Scoring agreed.	N/A	N/A

PI	PI Info	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
2.3.2	Yes	Yes	NA	Scoring agreed.	N/A	N/A
2.3.3	No (material score reduction expected to <80)	No (material score reduction expected to <80)	NA	I am concerned that nearly half of fishers have not been correctly completing logbooks, that information to score this PI is being drawn from other information recorded on an ad hoc basis. With such a high proportion of vessels not providing the requisite data, is it really correct to say quantitative information is adequate to assess the UoA related mortality, measure trends and support a strategy, when encounters with ETP are typically uncommon? This impacts on the scoring of both 2.3.3a and b. Would a condition requiring progress on data reporting be appropriate here, particularly in light of the recently deployed CCTV systems being as yet untested?	The requirement of Sla at SG80 is for 'some quantitative data adequate to assess threat to protection and recovery of the ETP species. Whilst Slb (SG80) requires information to assess trends, which the team take as having some quantitative data over time to ensure the strategy is working. It is true the logbook details for ETP interactions from 5 of the 12 vessels is not complete. In two of these cases the data is absent across non-target species logbook fields in the other three cases it's an absence of including 'zeros' in the returned forms for ETP interactions. Notwithstanding this issue, as evidenced in table 27 the logbooks of the remaining 7 vessels provide 'some quantitative data' between 2017 -2021 which provides insight into mortality (low) and the threat to ETP elements when measured against the population sizes as shown in tables 24 and 25. It would not be precautionary to say that this was 'adequate' on its own but in addition there is four consecutive years of observer data (zero mortality interactions) from the UoA and independent study of the UoA (see section 6.2.2.4) which show that interactions are very low. It's also worth noting that the observer program in place has access to the entire fleet, including the vessels with the logbook issue. In review of the FCR2.01 in relation to 'adequacy' GSA3.6.3 MSC state that <i>At SG80, the information adequacy required for the estimation of the impact of the UoA on the outcome of the species should be balanced against the likely impact on that particular species.....having only one form of data collection with a high level of potential bias or other limitation (e.g., logbooks or interviews with fishermen) by itself should not be enough to meet SG80 – additional</i>	Not accepted (no change)

PI	PI Info	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
					<p><i>information sources that compensate for the limitations would also need to be provided and assessed.</i></p> <p>MSC then provide Table GSA5 which has two columns which lists suitable verification methods and with observer programs and independent research (and CCTV) listed as ‘(A) higher level of verifiability, lower bias’ whilst logbooks are considered ‘(B) lower level of verifiability, higher bias’. MSC then state: ‘At the SG80 and 100 level in scoring issue (a), where a species is close to or below its limit or its status is uncertain, the team should expect that the UoA uses at least one method from Column A or an equivalent data source, and one or more from Column B to collect information to support the Outcome score for that species. However, where there is a high level of certainty that a species is well above its limit, less precaution is necessary and only two or more methods from Column B could be acceptable.</p> <p>Clearly from the information in Tables 24 and 25 the population statistics of the ETP elements are not near to their limits (with the possible exception of Harbour Porpoise but these still number over 35,000). For this fishery we have two data sources from Column A and one from column B and when referenced against the low level of interactions recorded in the fishery (table 27) and the observer reports/independent research SG80 can clearly be met for both Sla and b across all ETP elements based on MSC’s guidance.</p>	
2.4.1	Yes	Yes	NA	Scoring agreed.	N/A	N/A
2.4.2	Yes	Yes	NA	Scoring agreed.	N/A	N/A
2.4.3	Yes	Yes	NA	Scoring agreed.	N/A	N/A
2.5.1	Yes	Yes	NA	Scoring agreed.	N/A	N/A

PI	PI Info	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
2.5.2	Yes	Yes	NA	Scoring agreed.	N/A	N/A
2.5.3	Yes	Yes	NA	Scoring agreed.	N/A	N/A
3.1.1	Yes	Yes	NA	Scoring agreed.	N/A	N/A
3.1.2	Yes	Yes	NA	Scoring agreed.	N/A	N/A
3.1.3	Yes	Yes	NA	Scoring agreed.	N/A	N/A
3.2.1	Yes	Yes	NA	Scoring agreed. It is unfortunate that this reassessment takes place at a time when the UK's fishery management plans are still in development, and I would anticipate higher scores here in the very near future, however the overarching objectives of the TCA, coupled with the specific ones of the CSMA, are sufficient to justify scoring for this PI in the interim.	Thank you	N/A
3.2.2	Yes	Yes	NA	Scoring agreed.	N/A	N/A
3.2.3	Yes	Yes	NA	Scoring agreed.	N/A	N/A
3.2.4	Yes	Yes	NA	Scoring agreed.	N/A	N/A

PCDR stage

From: PeerReviewCollege <PeerReviewCollege@msc.org>
Sent: 05 July 2022 11:55
To: Hugh Jones <hjones@controlunion.com>
Subject: 3534 Cornwall Sardine - PR's follow-up comments PCDR stage

Hi Hugh,

Our peer reviewers have now reviewed your Team's responses to their comments in the PCDR for the Cornwall sardine fishery.

Our PR A has confirmed they are satisfied with the Team's responses to their comments and have none further to add.

Please find attached follow-up comments for PR B, including a specific request in the General Comments page. As with the initial peer reviews, please return your Team's completed responses to us in the actual spreadsheet used, in addition to pasting the results into the Final Report (see instructions in the first page of the spreadsheet). Please also note the need to code the replies using the explicit options in the drop-down menus (e.g. in Column K of the PI Comments page), noting that PR's comments may be split across two or more rows to enable you to give different answers in each case.

Best wishes,
Dan

Peer Review 2 – General Comments

Question	Peer Reviewer comments at Public Comment Draft Report stage	CAB response to Peer Reviewer's Public Comment Draft Report stage comments (as included in Final Draft Report)
List here any issues not covered in the Performance Indicators or Conditions table (following sheet) that you feel have not been adequately addressed in the CAB response and would make a material difference to the scoring of the fishery.	The removal of one of the two tables of slightly different catch data removes this source of uncertainty and the report reads more clearly as a result. Please note the minor typo in the year (2017) in the first sentence of section 6.1.3. I am still not clear what the exactly the figure in table 10 for "Total Catch" in 2019 refers to - catches in subarea 7 I assume - and why it differs from the figure in table 8, given they both cite ICES (2021a) as the source. Calendar year versus fishery year? Maybe the reason for this difference could be clarified a little in the caption.	The typo in section 6.1.3 is corrected. We have added a note to table 10 regarding the 'calendar year' for the CSMA data (UoA) and corrected the 2019 ICES figure which was incorrect here but correct in table 8.

Peer Review 2 – PI comments

PI	PR Comment Code	Peer Reviewer Justification	CAB response to Peer Reviewer's comments	CAB Response Code
1.2.1	Yes	I think the work highlighted by the CAB response, particularly the phrasing of paragraph 3.i.b, addresses my concerns clearly, demonstrating that if a CSMA proposed catch limit does not meet the stated objectives, either one proposed by Cefas or one following the ICES HCR will be used instead.	Thank you	NA (No response needed)
1.2.4	Yes	NA	N/A	NA (No response needed)

PI	PR Comment Code	Peer Reviewer Justification	CAB response to Peer Reviewer's comments	CAB Response Code
2.3.3	Yes	The CAB expand the justification that the data available is adequate to support the scoring, and I accept their argument. I look forward to hearing how the CCTV systems contribute to scores for this fishery in the future, as it would be a wasted opportunity not to develop this source of information.	Indeed	NA (No response needed)
3.2.1	Yes	NA	N/A	NA (No response needed)

Appendix 4 Stakeholder input

Cornwall IFCA

Topic of discussion	stakeholder meeting.
Date	11/10/2021
Format of discussion	Telephone call
Scope of Audit/Assessment	Cornwall sardine reassessment
Audit team members present	HJ
Client representation	N/A
Stakeholder representation	Colin Trundle Cornwall IFCA
Summary of main points	<p>Management of European Marine features and MCZs with respect to the ringnet fleet.</p> <p>Background</p> <p>Initial analysis by CIFCA at EU designation suggested that the CSMA fleet had no impact on seabed features. Recent revisions/observations and understanding of the gear operation suggest this is not true and they are now considered to potentially impact two habitats: seagrass and Maerl.</p> <p>Impacts are only likely in shallow water <30 m depth</p> <p>Maerl is found in Fal and Helford SAC but is protected in the Fal by the netting bylaw. There is also small amounts of live maerl in the bay</p> <p>Seagrass is a designated feature in four protected sites:</p> <p>Mounts bay MCZ</p> <p>Whitsands MCZ</p> <p>Fal and Helford SAC</p> <p>Plymouth sound SAC – Cawsands.</p> <p>Key concern is abrasion effect.</p> <p>Condition assessments for seagrass in both the Fal & Helford and Plymouth Sound & Estuaries SACs have been downgraded to <i>unfavourable</i>. This is not result of CSMA fleet interaction but vessel anchoring and mooring (yachts etc), however, all competent authorities are obliged to assess any activity/feature interactions in light of the condition assessment .</p>

	<p>For EU sites the seagrass extents are protected by the Cornwall IFCA European Marine Sites (Closed Areas) Byelaw 2 which prohibits ring nets being in contact with the seabed. European sites towed gear bylaw applicable at Fal and Plymouth.</p> <p>Current measures include survey work at all four MPAs to improve distribution knowledge.</p> <p>It is likely that in the future prohibition will be considered for the MCZs under MACA also, but this is yet to go through the full byelaw making process and will take minimum 12 months.</p> <p><u>disputes</u></p> <p>There are currently no disputes in the fishery in fishery and the co-governance system is working well.</p>
Action points to follow	<p>HJ to review Natural England status assessments of seagrass from website</p> <p>Review the Marine site CIFCA bylaw</p>
Addition info	<p>N/A</p>

Table 35. MSC stakeholder input template. NOTE this is a repeat of the information contained in the stakeholder input above but is required under the FCP2.2. As per MSC interpretation ([link](#)) the verbal information is critical to the assessment and has therefore been transcribed into this template by the assessment team.

Input summary	Input detail	Evidence or references	Stakeholder input code	CAB response to stakeholder input	CAB response code
	<p>Management of European Marine features and MCZs with respect to the ringnet fleet.</p> <p>Background</p> <p>Initial analysis by CIFCA at EU designation suggested that the CSMA fleet had no impact on seabed features. Recent revisions/observations and understanding of the gear operation suggest this is not true and they are now considered to potentially impact two habitats: seagrass and Maerl.</p> <p>Impacts are only likely in shallow water <30 m depth</p> <p>Maerl is found in Fal and Helford SAC but is protected in the Fal by the netting bylaw. There is also small amounts of live maerl in the bay</p> <p>Seagrass is a designated feature in four protected sites:</p> <p>Mounts bay MCZ</p> <p>Whitsands MCZ</p> <p>Fal and Helford SAC</p> <p>Plymouth sound SAC – Cawsands.</p> <p>Key concern is abrasion effect.</p>		Scoring implications unknown	Thank you this will be accounted for in the scoring of this PI	Accepted (score increased)

Input summary	Input detail	Evidence or references	Stakeholder input code	CAB response to stakeholder input	CAB response code
	<p>Condition assessments for seagrass in both the Fal & Helford and Plymouth Sound & Estuaries SACs have been downgraded to <i>unfavourable</i>. This is not result of CSMA fleet interaction but vessel anchoring and mooring (yachts etc), however, all competent authorities are obliged to assess any activity/feature interactions in light of the condition assessment .</p> <p>For EU sites the seagrass extents are protected by the Cornwall IFCA European Marine Sites (Closed Areas) Byelaw 2 which prohibits ring nets being in contact with the seabed. European sites towed gear bylaw applicable at Fal and Plymouth.</p> <p>Current measures include survey work at all four MPAs to improve distribution knowledge.</p> <p>It is likely that in the future prohibition will be considered for the MCZs under MACA also, but this is yet to go through the full byelaw making process and will take minimum 12 months.</p> <p>disputes</p> <p>There are currently no disputes in the fishery in fishery and the co-governance system is working well.</p>				

CEFAS

Topic of discussion	stakeholder meeting.
Date	01/02/2022
Format of discussion	Conference call
Scope of Audit/Assessment	Cornwall sardine reassessment
Audit team members present	HJ, MvB and SdC
Client representation	N/A
Stakeholder representation	Rosana Ourens, (Cefas) Jeroen Van Der Kooij (Cefas) Richard Nash (Cefas)
Summary of main points	<p>Introductions and roles, briefing on the MSC standard and the UoA.</p> <p><u>PELTIC</u></p> <p>Discussion on the PELTIC survey (2017 onwards) change in the scale to incorporate more of the sardine stock. 2021 5th year of data.</p> <p>CEFAS are comfortable that the centre of distribution (density distribution) of the stock is on the UK coast of the channel. Further the distribution of eggs is highest in northern part of the channel. The exact boundaries of the stock to the south (French coast) are less well known but the stock is defined as best can be done based on present available information.</p> <p>ICES benchmark has confirmed the stock area.</p> <p><u>Stock data</u></p> <p>Self-sampling is not in the SA as a longer time series is needed however is useful in the benchmark to ensure stock identity.</p> <p><u>Stock assessment</u></p> <p>SPICT model to check status of the stock. The model has been MSE tested by ICES and found to be precautionary. However the CI were high and therefore it doesn't provide the ICES advice. Rather this comes from the 1 over 2 rule.</p> <p>The SPICT model does not provide a LRP only relative F_{MSY} and MSY RPs. The available LRP comes from the 1o2 rule and the biomass from the PELTIC survey. In WKLIFE the LRP equation is given. LRP has changed from the benchmark to the latest working group after an error in the benchmark.</p> <p><u>HCR testing</u></p> <p>The 1o2 rule has been MSE tested and applied to the stock based on the ICES data limited framework. Essentially for this stock the starting point of the 1o2 rule has</p>

	<p>created an issue as the ICES advice is designed for stocks which are fully exploited and not ones which are underexploited.</p> <p>The issue with the accepted HCR and advice from ICES is that this stock is only moderately exploited and the starting point for the 1o2 rule is low because of a combination of market forces, the CSMA catch limit and lack of opportunistic factory trawlers harvesting the stock in the past 2 years.</p> <p>What was never fully sorted out by ICES was how and where to start the 1o2 advice rule from. For heavily exploited stocks the catch level the 1o2 is ok but where the resource is underexploited it penalises the starting point which lowers the advice for the stock. This is the key issue on this stock and catches do not track stock size.</p> <p>Further the starting point is relevant from a biomass trend also. This started really very high (300 k 2018) and if the 1o2 was applied then the advice would be much higher, but the stock was always going to 'decline' (220 k is still very high) but not as a result of fishing mortality just environmental (recruitment) factors. However this impacts the new advice as the 1o2 is based on this lower relative abundance. There is no relationship between fishery impact and biomass trends because the F is so low therefore the 1o2 rule as the HCR is not the most appropriate and the stock can support higher catches without any significant impact on the stock biomass. 10,000 t Catch limit appears reasonable. As an example the BoB sardine biomass estimates from survey are of similar magnitude to Subarea 7 but with TAC at around 20,000 to 30,000 t. Further, HR with values of 9 -10% don't usually impact a stock. From a survey you estimate the catchability of the stock and for sprat (in subarea 7) at 10 % was considered precautionary. For sprat this also included an uncertainty factor which pulled it down from 15% HR. Constant HR rates are novel.</p> <p>CEFAS raised the issue of the 1o2 HCR at the benchmark and the chair pushed this to the working group with the resolutions proposed by CEFAS but at the working group it was implied that the benchmark should have addressed it.</p> <p>6 models run for HCR advice were proposed in the working group the one adopted by ICES is 6906 t and has been accepted because it is underpinned by the MSE process. The other models which allow for higher HR's were essentially not accepted because they didn't have a MSE to evaluate them.</p> <p>Biomass will now drive the HCR, but the damage is done because the starting point is set, and the biomass change will push up or down against this starting point.</p> <p>For more appropriate advice it is a case of a longer time series of data in the stock assessment and a better understanding of the HR rate appropriateness will allow for a better HCR starting point to be proposed. This will not come until data is available a new MSE can be applied and /or until the next benchmark or interbenchmark. This will be driven by CEFAS.</p> <p>This is quite a novel situation and it's a new stock assessment and HCR which will develop and improve with time. Overall the ICES HCR is not appropriate for the stock.</p> <p><u>CSMA HCR</u></p> <p>In light of the ICES advice detailed above CSMA have been working closely with the CEFAS to develop an HCR which matches their fishery objectives and have signing off with their approval. The draft of the HCR allows for catch limits above the ICES advice (because of the issues in the ICES HCR) but importantly requires annual 'approval'</p>
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	confirmation with CEFAS that the advice is appropriate , does not risk F being too high. It also contains clauses where CEFAS do not agree to the CSMA catch for CEFAS to recommend a level. This should ensure that that the catch advice is reduced if RPs are approached. The CSMA HCR has a proposed time limit to 2024 whilst the information that underpins the stock assessment and the HCR is further developed (expanded time series, as above). Therefore the CSMA HCR should be considered a key HCR tool in the meantime in the short term with an aim to have an improved ICES HCR by the time of the next interbenchmark.
Action points to follow	CEFAS confirmation of support for the CSAM HCR.
Addition info	N/A

From: Jeroen Van Der Kooij (Cefas) <jeroen.vanderkooij@cefass.co.uk>
Sent: 04 February 2022 16:54
To: Richard Caslake <Gus.Caslake@seafish.co.uk>
Cc: Rosana Ourens (Cefas) <rosana.ourens@cefass.co.uk>; Richard Nash (Cefas) <richard.nash@cefass.co.uk>
Subject: Sardine Harvest Control Rule

Hi Gus,

Sorry it has taken longer than planned.

Cefas supports the HCR proposed by CSMA (shared in your email from 02/02/2022) and is of the opinion that the current catch limit of 10,483,926 kgs set by the CSMA for 2022 is likely to maintain the overall exploitation rate below F_{MSY} , and unlikely lead to an overall exploitation rate which would reduce biomass to approach the point of recruitment impairment.

Happy for you to pass this on to MSC

Thanks
 Jeroen

Table 36. MSC stakeholder input template. NOTE this is a repeat of the information contained in the stakeholder input above but is required under the FCP2.2. As per MSC interpretation ([link](#)) the verbal information is critical to the assessment and has therefore been transcribed into this template by the assessment team.

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Stakeholder input code	CAB response to stakeholder input	CAB response code
Principle 1 - Sustainable fish stocks						
1.1.1 - Stock status		<p>PELTIC Discussion on the PELTIC survey (2017 onwards) change in the scale to incorporate more of the sardine stock. 2021 5th year of data.</p> <p>CEFAS are comfortable that the centre of distribution (density distribution) of the stock is on the UK coast of the channel. Further the distribution of eggs is highest in northern part of the channel. The exact boundaries of the stock to the south (French coast) are less well known but the stock is defined as best can be done based on present available information.</p> <p>ICES benchmark has confirmed the stock area.</p> <p>Stock data</p> <p>Self-sampling is not in the SA as a longer time series is needed however is useful in the benchmark to ensure stock identity.</p> <p>Stock assessment</p>		Scoring implications unknown	this information confirms the information available in the ICES assessments and has helped galvanise the response	Accepted (no score change - change to rationale)

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Stakeholder input code	CAB response to stakeholder input	CAB response code
		<p>SPICT model to check status of the stock. The model has been MSE tested by ICES and found to be precautionary. However the CI were high and therefore it doesn't provide the ICES advice. Rather this comes from the 1 over 2 rule. The SPICT model does not provide a LRP only relative F_{MSY} and MSY RPs. The available LRP comes from the 1o2 rule and the biomass from the PELTIC survey. In WKLIFE the LRP equation is given. LRP has changed from the benchmark to the latest working group after an error in the benchmark.</p>				
1.2.1 Harvest strategy	-	see comments on 1.1.1 re monitoring and 1.2.2 on HCR and 1.2.4 on assessment suitability		Scoring implications unknown	this information confirms the information available in the ICES assessments and the ability of the CSMA HCR to maintain the stock at required levels, the ICES HCR issue is considered under 1.2.4a. Overall this has helped galvanise the team response to this PI.	Accepted (no score change - change to rationale)

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Stakeholder input code	CAB response to stakeholder input	CAB response code
1.2.2 - Harvest control rules and tools		<p>HCR testing</p> <p>The 1o2 rule has been MSE tested and applied to the stock based on the ICES data limited framework. Essentially for this stock the starting point of the 1o2 rule has created an issue as the ICES advice is designed for stocks which are fully exploited and not ones which are underexploited. The issue with the accepted HCR and advice from ICES is that this stock is only moderately exploited and the starting point for the 1o2 rule is low because of a combination of market forces, the CSMA catch limit and lack of opportunistic factory trawlers harvesting the stock in the past 2 years.</p> <p>What was never fully sorted out by ICES was how and where to start the 1o2 advice rule from. For heavily exploited stocks the catch level the 1o2 is ok but where the resource is underexploited it penalises the starting point which lowers the advice for the stock. This is the key issue on this stock and catches do not track stock size.</p> <p>Further the starting point is relevant from a biomass trend also. This started really very high (300 k 2018) and if the 1o2 was applied then the advice would be much higher, but the stock was always going to 'decline' (220</p>		Scoring implications unknown	this information confirms the information available in the ICES HCR documentation (WKWEST, and the working group documents published in Nov 2021) and why the ICES HCR set in the ICES advice 2021 is so low for 2022. the appropriateness of the ICES HCR is considered under 1.2.4a. Given the issue of the ICES HCR and the development of the CSMA HCR which has received the approval of CEFAS (see email) this information has been incorporated into the scoring of the PI. The HCR tool (CSMA catch limit) has been evaluated by CEFAS and found	Accepted (score increased)

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Stakeholder input code	CAB response to stakeholder input	CAB response code
		<p>k is still very high) but not as a result of fishing mortality just environmental (recruitment) factors. However this impacts the new advice as the 1o2 is based on this lower relative abundance. There is no relationship between fishery impact and biomass trends because the F is so low therefore the 1o2 rule as the HCR is not the most appropriate and the stock can support higher catches without any significant impact on the stock biomass. 10,000 t Catch limit appears reasonable. As an example the BoB sardine biomass estimates from survey are of similar magnitude to Subarea 7 but with TAC at around 20,000 to 30,000 t. Further, HR with values of 9 -10 % don't usually impact a stock. From a survey you estimate the catchability of the stock and for sprat (in subarea 7) at 10 % was considered precautionary. For sprat this also included an uncertainty factor which pulled it down from 15% HR. Constant HR rates are novel.</p> <p>CEFAS raised the issue of the 1o2 HCR at the benchmark and the chair pushed this to the working group with the resolutions proposed by CEFAS but at the working group it was implied that the benchmark should have addressed it.</p> <p>6 models run for HCR advice were proposed</p>			<p>to be precautionary. Overall this information and the interview has led to an increase in the score of this PI</p>	

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Stakeholder input code	CAB response to stakeholder input	CAB response code
		<p>in the working group the one adopted by ICES is 6906 t and has been accepted because it is underpinned by the MSE process. The other models which allow for higher HR's were essentially not accepted because they didn't have a MSE to evaluate them.</p> <p>Biomass will now drive the HCR, but the damage is done because the starting point is set and the biomass change will push up or down against this starting point. For more appropriate advice it is a case of a longer time series of data in the stock assessment and a better understanding of the HR rate appropriateness will allow for a better HCR starting point to be proposed. This will not come until data is available a new MSE can be applied and /or until the next benchmark or interbenchmark. This will be driven by CEFAS.</p> <p>This is quite a novel situation and it's a new stock assessment and HCR which will develop and improve with time. Overall the ICES HCR is not appropriate for the stock.</p> <p>CSMA HCR</p> <p>In light of the ICES advice detailed above CSMA have been working closely with the CEFAS to develop an HCR which matches</p>				

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Stakeholder input code	CAB response to stakeholder input	CAB response code
		<p>their fishery objectives and are close to signing off with their approval. The draft of the HCR allows for catch limits above the ICES advice (because of the issues in the ICES HCR) but importantly requires annual 'approval' confirmation with CEFAS that the advice is appropriate , does not risk F being too high. It also contains clauses where CEFAS do not agree to the CSMA catch for CEFAS to recommend a level. This should ensure that that the catch advice is reduced if RPs are approached. The CSMA HCR has a proposed time limit to 2024 whilst the information that underpins the stock assessment and the HCR is further developed (expanded time series, as above). Therefore the CSMA HCR should be considered a key HCR tool in the meantime in the short term with an aim to have an improved ICES HCR by the time of the next interbenchmark.</p> <p>From: Jeroen Van Der Kooij (Cefas) <jeroen.vanderkooij@cefasc.co.uk></p> <p>Sent: 04 February 2022 16:54</p> <p>To: Richard Caslake <Gus.Caslake@seafish.co.uk></p>				

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Stakeholder input code	CAB response to stakeholder input	CAB response code
		<p>Cc: Rosana Ourens (Cefas) <rosana.ourens@cefas.co.uk>; Richard Nash (Cefas) <richard.nash@cefas.co.uk></p> <p>Subject: Sardine Harvest Control Rule</p> <p>Hi Gus,</p> <p>Sorry it has taken longer than planned.</p> <p>Cefas supports the HCR proposed by CSMA (shared in your email from 02/02/2022) and is of the opinion that the current catch limit of 10,483,926 kgs set by the CSMA for 2022 is likely to maintain the overall exploitation rate below F_{MSY}, and unlikely lead to an overall exploitation rate which would reduce biomass to approach the point of recruitment impairment.</p> <p>Happy for you to pass this on to MSC</p> <p>Thanks</p> <p>Jeroen</p>				

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Stakeholder input code	CAB response to stakeholder input	CAB response code
1.2.4 - Assessment of stock status		See comments in 1.2.2		Scoring implications unknown	the appropriateness of the ICES HCR is considered here in 1.2.4a and based on the interview has resulted in a reduced score. Please see rationale for 1.2.4a	Accepted (score reduced to 60-80, condition raised)

MMO

From: Elson, Carley <Carley.Elson@marinemanagement.org.uk>
Sent: 03 March 2022 14:20
To: Hugh Jones <hjones@controlunion.com>
Cc: Sophie Des Clers <sdesclers@controlunion.com>
Subject: RE: 3534_VMS data request

Hello Hugh,

My sincere apologies on my delayed response to you, things have been a bit busy of late. Please see below for the compliance records for the CSMA fleet. I have not named the vessels individually as that would require a DPA request but all offences are against the Control Regulation, mostly the late/non submission of landing declarations.

2019

1x Verbal rebrief for no return to port
 3x Written rebrief for failure to record species on landing declaration/inaccurate sales notes.

2020

6 x Written rebriefs for late/non submission of landing declarations
 1x Official Written warning for late submission of landing declarations

2021

4x Written rebriefs for late/non submission of landing declaration.

Kind Regards,

Carley

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Carley Elson | Principal Marine Officer SW (TARA) | Marine Management Organisation


 The Fish Quay | Sutton Harbour | Plymouth | PL4 0LH

Table 37. MSC stakeholder input template. NOTE this is a repeat of the information contained in the stakeholder input above but is required under the FCP2.2. As per MSC interpretation ([link](#)) the verbal information is critical to the assessment and has therefore been transcribed into this template by the assessment team.

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Stakeholder input code	CAB response to stakeholder input	CAB response code
Principle 3						

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Stakeholder input code	CAB response to stakeholder input	CAB response code
3.2.3		"2019 1x Verbal rebrief for no return to port 3x Written rebrief for failure to record species on landing declaration/inaccurate sales notes. 2020 6 x Written rebriefs for late/non submission of landing declarations 1x Official Written warning for late submission of landing declarations 2021 4x Written rebriefs for late/non submission of landing declaration."		Scoring implications unknown	Thank you this will be accounted for in the scoring of this PI	Accepted (score increased)

Appendix 5 Conditions

Appendix 5.1 Summary of Conditions closed under Previous Certification

Table 38. Summary of previous assessment conditions

Condition	PI(s)	Year closed	Justification
The harvest strategy and harvest control rules are not fully responsive to the stock status. The main fishery on this stock is the South Brittany sardine fishery (MSC certificate number F-BV-552727-FR). The South Brittany certification was conditional on developing a responsive harvest strategy and control rule. Since the Cornish fishery takes a negligible proportion of the catch, it cannot participate directly in this activity, but the condition was to promote and support the development of the management system for the overall stock.	1.2.1	2013	This condition was met in Year 3 and CSMA have shown that they have taken pro-active measures to encourage membership, review of any stock information and liaise with policy makers to support their voluntary harvesting strategy.
The harvest strategy and harvest control rules are not fully responsive to the stock status. The main fishery on this stock is the South Brittany sardine fishery (MSC certificate number F-BV-552727-FR). The South Brittany certification was conditional on developing a responsive harvest strategy and control rule. Since the Cornish fishery takes a negligible proportion of the catch, it cannot participate directly in this activity, but the condition was to promote and support the development of the management system for the overall stock.	1.2.2	2013	This condition was met in Year 3 and CSMA have shown that they have taken pro-active measures to encourage membership, review of any stock information and liaise with policy makers to support their voluntary harvesting strategy.
The catch of non-target retained species is considered very likely to be minimal (i.e. less than the 5% threshold to be considered as 'main' retained species). However, quantitative information could not be provided to demonstrate this conclusively.	2.1.3	2011	This condition was met in Year 1, and CSMA have shown improved completion of log sheets and a greater representation of vessels targeting sardines. Recommendation: CSMA holds a short training session for skippers on how to fully fill out the electronic log-sheets.
Discarded bycatch comes mainly via 'slippage' of the ring net catch. Documentary / quantitative evidence is lacking on frequency of slippage, species involved and discard survival.	2.2.3	2011	This condition was met in Year 1 and CSMA have continued to fulfil this condition by providing information on discards in log-sheets and improving the completion of log-sheets and representation of the association. However, the electronic log-sheets do not provide space to record the reason for slippage/discards.

Condition	PI(s)	Year closed	Justification
The management system does not include explicit objectives.	3.2.1	2011	The fishery developed and documented fishery-specific objectives for MSC Principle 1 and MSC Principle 2 that were agreed to by all major stakeholders and consistent with UK national policy.
The decision-making process needs to be explicitly precautionary, and to incorporate the HCR (once developed under PI 1.2.2 above).	3.2.2	2013	This condition was met in Year 3, following the definition of harvest control rules for the South Brittany fishery, and continues to be met with CSMA staying informed on any new research information and continuing dialogue with CIFCA and MMO on options to formalise their own voluntary harvest control rules. Recommendation: CSMA also review any new information/results from the WGHANSA working group on the Bay of Biscay Stock; any changes in harvest strategy by the South Brittany fishery; and the latest ICES advice at their AGM. Recommendation: CSMA continue dialogue with CIFCA and MMO to formalise harvest control rules if there is evidence that the stock is under pressure.
Research on the stock is underway (e.g. surveys were under development by CEFAS during assessment) but a research plan had not been fully developed.	3.2.4	2013	This condition was met in Year 3, and CSMA have continued to pro-actively contributed their annual statistics to CEFAS, review the latest stock assessment information through CEFAS and pro-actively follow up the option to collaborate with CEFAS on a potential new research programme.
By the second surveillance audit, evidence shall demonstrate that a harvest strategy is in place and the elements of the harvest strategy work together by ensuring that total international catches of VIII/VII sardine are no higher than those advised by ICES.	1.2.1	2018	Closed due to change in stock status and condition now not being relevant to the new stock identity
By the third surveillance audit, provide evidence that the management strategy outlined for the Spanish, French and Cornish fisheries has been implemented for the VIII/VII sardine stock, that there is well defined HCR which will reduce exploitation if there are indications that the stock is declining (as provided by ICES), such that catch levels are reduced as necessary.	1.2.2	2018	Closed due to change in stock status and condition now not being relevant to the new stock identity
There shall be a research plan in place that provides the management system with a strategic approach to research and reliable and timely information, sufficient to	3.2.4	2020	Closed as the CSMA put together a Research Plan that cover all three Principles, with a strong emphasis on generating research partnerships and regular and timely data

Condition	PI(s)	Year closed	Justification
achieve the objectives consistent with Principles 1 and 2.			collection that can feed into ICES WGHANSA through Cefas (Principle 1) and into SMRU (Principle 2), SG80 is met. The Research Plan also covers the P3-relevant aspects regarding difficulties of data reporting such as species identification for ETP species and bycatch, with planned video cameras on board each vessel, in partnership with the MMO and IFCA.

Appendix 5.2 Open Conditions at reassessment announcement

PI 2.3.3 – condition 3.

Performance Indicator	2.3.3a	
Score	65	
Justification	There is sufficient information to be able to quantitatively estimate the impact of fishing on cetaceans as CSMA members record any cetacean interactions within their log-sheets. It is also possible to qualitatively estimate any fishery-related mortality for pinnipeds (seals) and seabirds given that this fishery is considered by stakeholders to be low-risk for bycatch issues. However, as interactions with pinnipeds or seabirds are not explicitly recorded within CSMA log-sheets it is not possible to quantitatively estimate fishery related mortality for this group (which is required to achieve an 80 score for scoring issue a); or to determine trends in impacts on these groups (which is required to score 80 on scoring issue c).	
Condition	Record and analyse any cetacean, pinniped (seal) or seabird mortalities (specifically black-backed gulls (<i>Larus fuscus</i> , <i>Larus marinus</i>); herring gulls (<i>Larus argentatus</i>) & fulmars (<i>Fulmarus glacialis</i>)) within CSMA log-sheets.	
Condition Start	PCR	
Condition Deadline	Year 4 Year 1 reassessment – under MSC derogation 6	
Milestones	By 4th 1 st reassessment annual surveillance audit analyse data to assess any trends in mortality (if any mortality has been observed)	
Surveillance	Year 1	The client has completed the revisions to the logbook required for the milestones so that there is a dedicated section for recording ETP interactions by group (cetacean, seal, and bird) (see appendix 5). However, there is not evidence that the logbooks are being correctly filled out for this section. The original CAP implied this would be completed by year 3 and the team considers that although this is not a directed milestone for year 1 its importance should not be overlooked and therefore an additional milestone for year 2 has been added to address this.
	Year 2	Logbook revisions to include seabird / seal and dolphin catches were made for the 2018/19 season (appendix 5.1) and the sample of logbooks examined by the assessment team were all complete in terms of ETP catches including 'zero' where required. In addition as detailed in the year 2 audit report the CSMA have taken independent observers in 2018 with the results of these providing verification of the low ETP encounter rate and which species are encountered (herring gull). At the site visit the CSMA explained that the phone / computer app had been developed (the

		<p>assessment team were shown the relevant emails) but that at present the CSMA didn't wish to develop this further.</p> <p>With the addition of 2018 logbook data, observer report and previous information about the fishery, the team considered whether this condition could be closed out at this surveillance audit. However, given that the observer data only had 13 trips in 2018 and didn't include those vessels operating in the east (Plymouth etc.) the team felt that an additional year of data was required.</p>
	Year 3	<p>Logbook revisions made in previous years continued in the 2019-2020 season with dedicated columns for seabirds, seals and dolphin interactions. CU sampled the logbooks from the season and found overall good compliance with completing this section including zeros where no interaction was apparent, although a few vessels did not always complete this logbook area (Table 8). CU do note that this section of the logbook doesn't include specification by species in the logbooks and therefore addresses the issue at species group level. However, skippers are asked when interactions occur to enter this information in the comments section of the logbooks. Further, observer records do identify the species involved and provide quantitative evidence of interaction by species.</p> <p>For cetacean interaction an incident of capture and release of three individuals in February 2020 by one of the UoA vessels has prompted the development of a Cetacean Interaction Policy document in conjunction with the Sea Mammal Research Unit (SMRU). This policy will be in place for the 2020-2021 season. The measures include:</p> <p>Prior to deployment of net conduct visual observations to check for cetacean activity in the are and if observed close to the vessel either delay deployment or move to another area to reduce risk of interaction.</p> <p>If cetaceans are found in the net after deployment, the skipper and crew must prioritise the release of the animals at the earliest safe opportunity by following the agreed protocols for that vessel e.g. stop hauling, lower the headline.</p> <p>Details of all interactions with cetaceans that result in animals being within the net will be recorded in the vessel logbook and made available to SMRU.</p> <p>Management reviews in 2020 has included agreement for camera monitoring for the 2020 – 21 season.</p> <p>Regarding camera fitting this has already begun on vessels ahead of the season and the intent is for IFCA to review the camera placement and ensure it captures the deck area and brail / pump area of the vessel. An independent panel for reviewing such incidents is being arranged, but is not yet in place. In addition to this fleet wide camera installation the CSMA have requested funding through the CEFAS I360 fund for artificial Intelligence REM system which allows capture of audio from the vessel of crew engagement as well as video footage. Finally, one vessel in the fleet currently carries an REM camera, but the footage is not systematically reviewed. This is trial project with MMO.</p> <p>Further gear modifications also discussed at the management review are primarily driven by slippage needs they will also be beneficial in ETP interaction events.</p> <ul style="list-style-type: none"> • Reduce net floatation • V-cut bunt end making easier to spill fish • Reducing net length • Multicoloured bunts to mark fish volumes
	Year 4	<p>The information available for consideration under this component are:</p> <ul style="list-style-type: none"> • Logbook records from the CSMA fleet – including ETP interactions - Logbook compliance for the fleet for ETP species is not complete with 5 of the 12 vessels not fully completing this section of the CSMA

	<p>logbooks (Table 20). However, records include comments on interaction types and fate where recorded and the numbers are low;</p> <ul style="list-style-type: none"> • Observer records of catch profiles (4 years) 2018-2021 (SMRU 2018) (SMRU 2019) , which shows limited ETP interaction to identified seagull species and a low mortality rate against the population sizes; • PELTIC survey data – there is annual monitoring of cetacean and seabird numbers which overlap with the UoA footprint (section 6.2.7.3); • Population estimates for all ETP elements e.g. (NAMMCO 2019), (Hammond et al. 2017) and references listed in Table 22 and Table 23 and Table 24, which can be cross referenced against the UoA catches <p>Based on the above information, there is qualitative evidence and some quantitative information available on the catch rate of ETP by the UoA, which enables a numerical estimate of mortality, and which can be cross-checked against the UoA observer program. There is also information available about the population abundance for all ETP elements considered for the UoA. The combination of both the mortality estimate and the population data allows the impact of the UoA on the species to be assessed. SG60 and SG80 are met.</p>
Progress Status	This condition was ‘closed’ at year 4
Carrying over condition <input type="checkbox"/>	No
Closing the condition during the reassessment	No - The information received at the year 4 surveillance audit site visit confirmed that the information base was suitable to close this condition.

PI 3.2.1 – condition 4.

Performance Indicator	3.2.1
Score	60
Justification	<p>There are objectives, which are broadly consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, and implicit within the fishery’s management system in the European Union and National policy. However, there are not explicitly defined and specific short and long-term management objectives for the purse seine sardine fishery. There is no specific management plan for the ICES area under assessment.</p> <p>This was a condition in the original assessment and closed out during the first surveillance. The first surveillance audit report states that formal objectives were agreed but documented evidence was not available. This was also the case during the reassessment and therefore re-raised as a condition (https://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-east-atlantic/cornwall-sardine/assessment-downloads/20120514_SR.pdf).</p>

Condition	Implement specific short and long-term management objectives which are explicitly defined within the fishery management system	
Condition start	PCR 2017 amended in 2019	
Condition deadline	Year 1 of reassessment	
Milestones	By 4 th 1 st year of reassessment annual surveillance audit short and long-term objectives for the sardine fishery, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, need to be explicitly included in the management of the fishery. Score: 80.	
Progress on condition	Year 1	The CSMA has worked with both IFCA and MMO officers and, on the basis of a questionnaire to its members and the public, has issued a new Code of Conduct for the CSMA ring-net fishery that took effect in 2017-18.
	Year 2	<p>CEFAS has proposed a revised scientific advice for sardine in Subarea 7 (Carpi et al. 2019), aiming to obtain a revised ICES benchmark from ICES by 2020. Work with other fisheries, to develop a long-term management plan for the sardine fishery in Areas VII may be delayed until the Brexit process comes to a conclusion, however the UoA provided evidence of email conversations with the other fisheries in 2018.</p> <p>In the meantime, the CSMA has worked with both IFCA and MMO officers to update its Code of Conduct for the CSMA ring-net fishery for the season 2018-19 (CSMA 2018), which includes a pledge of members to abide by all management measures, in order to reduce the fishery's impacts as per MSC Principle 1 and Principle 2 indicators.</p> <p>An agreement with the SMRU exists since 2018 that guarantees scientific on board observations and an annual report on potential impacts on ETPs from the fishery (SMRU 2018).</p>
	Year 3	<p>A long-term management plan for the Area VII stock remains unlikely until Brexit fisheries negotiations are finalised. Continued Brexit negotiations in 2020 are preventing further discussion with other Member States who have sporadically targeted sardine in the past. Until there is a clear idea of EU access to UK waters and the terms of that access any further agreement between fisheries is on hold.</p> <p>The milestone at Year 3 for this condition was set under the previous stock definition when ICES guidance was available. The revised benchmark from ICES is now confirmed for 2021, the results of which will be used by CEFAS to advise the CSMA on long and short-term fishery-specific objectives for the targeted sardine stock (Principle 1) in 2021 to be signed off by its membership. Until then, the CSMA is committed to a control of the fleet fishing capacity, as was illustrated it turning down a new membership application at the end of 2019 (G. Caslake, pers. Comm. and CSMA (2020e)).</p> <p>Regarding the fishery's impacts on ETP and bycatch species (Principle 2), the long and short-term objectives remain to minimise the fishery's impacts. The CSMA fishery's actions to improve recording are ongoing, but improvements are still needed for all vessels to complete the relevant logbook sections. The CSMA has issued Guidance on logbooks to its membership following the site visit (Appendix 4.4).</p>

		Although there have been significant improvements in some areas within the fishery there are still no CSMA fishery-specific explicit short and long term objectives consistent with the MSC's Principles 1 and 2.
	Year 4	<p>The CSMA defined explicit fishery-specific objectives in 2021. For the short-term, with the support of CEFAS, short-term objectives are integrated in the Harvest Strategy for Principle 1, to maintain the fishing mortality rate F below F_{MSY}, and to ensure that the biomass would not approach the point of recruitment impairment. Catch rates are to be set annually by the CSMA on the advice of CEFAS, to ensure that the HCRs deliver the objectives expected outcomes. For Principle 2, short-term objectives to minimise impacts correspond to existing regulatory obligations regarding the fishery's impacts on bycatch species (e.g. mackerel), ETP species (e.g. marine mammals, seabirds) and on Habitats, already included in the Code of Conduct and Slippage policy.</p> <p>For the long-term, the Harvest Strategy is based on three objectives, which are consistent with achieving the outcomes expressed by Principles 1 and 2: 1) Fishery specific objective: Maintain good and adaptive management procedures that utilise a precautionary approach towards the long-term sustainability of the fishery, based on the biological and population characteristics of the species. 2) Environmental objective: To minimise the impact of fishing activity on the marine environment. Maintain an effective code of conduct for all CSMA members. 3) Economic objective: Maintain stability to the resource in such a way as to ensure its economic sustainability and ongoing benefit to the Cornish, Plymouth community and CSMA members.</p> <p>Both short and long-terms objectives are explicit and are now included in the CSMA Code of Conduct. The objectives are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, and are now explicit in the management system. SG80 is met.</p>
Progress status	This condition was 'closed' at year 4	
Carrying over condition <input type="checkbox"/>	No	
Closing the condition during the reassessment	No - The information received at the year 4 surveillance audit site visit confirmed that the information base was suitable to close this condition.	

PI 3.2.2 - condition 5.

Performance Indicator	3.2.2
Score	75
Justification	A decision-making process is established by CSMA. All issues regarding the fishery are discussed at annual meetings, and decisions taken and disseminated; however this does not result in measures and strategies to achieve the fishery-specific objectives. The only measure imposed to members so far is a limitation of the quantity of sardines landed per 24 hours. The proposed limitation to 20 boats in the ring netting fleet has not been accepted by MMO.

	This condition was raised during initial certification, and closed at the year 3 surveillance as the French condition for the same PI was also closed (https://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-east-atlantic/cornwall-sardine/assessment-downloads/20130820_SR_SAR031.pdf)	
Condition	The precautionary approach must be clearly and explicitly incorporated into the decision-making process. This is closely linked to the development of a Harvest Control Rule under PI 1.2.2. That Harvest Control Rule must be explicitly incorporated into the decision-making process.	
Condition start	PCR 2017 amended in 2019	
Condition deadline	Year 1 of reassessment	
Milestones	By 4th 1 st year of reassessment annual surveillance audit the fishery must demonstrate there are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives, including responsive HCRs. Score: 80	
Progress on condition	Year 1	CEFAS has confirmed that they have had access to the CSMA logbook data, and that future assessments should provide the basis for the decision-making on a new harvest strategy. Presently, ICES' new stock definition in 2017 means that there currently are no analytic assessments or reference points for this "new" stock. (category 5). However, the CSMA has already made substantial progress to include decision-making processes to control fishing effort (max. number of vessels, max weekly catch per vessel) in its revised Code of Conduct
	Year 2	<p>CEFAS has access to the CSMA logbook data, which have been used to in a new stock assessment that should provide the basis for the decision-making on a new harvest strategy. On the basis, of several and now regular scientific cruises CEFAS recommends that ICES upgrades the newly defined stock from category 5 to category 3.</p> <p>CSMA has renewed its pledge to abide by all management measures and decision-making processes to control fishing effort (max. number of vessels, max weekly catch per vessel) in its revised Code of Conduct.</p>
	Year 3	Decision making processes are recorded in CSMA minutes (CSMA 2020a; CSMA 2020b; CSMA 2019; CSMA 2020d; CSMA 2020c) and in fishery-specific documents that form part of the CSMA Code of Conduct. Decisions are informed by the best available scientific advice from CEFAS (annual stock survey results) and from SMRU (annual Bycatch monitoring and CSMA Slippage Policy cetacean 2020 Appendix 4.3). Signature of the 2020 CoC updates may be delayed until it is safe for meetings to be convened, but actions are on target.
	Year 4	In 2021, the CSMA members have adopted a Harvest Strategy setting out their process to the adoption of an annual catch limit (ref in text). One of the adaptive management guiding principles is the precautionary approach, that underpins each step the their decision-making process. The catch limit has to be agreed by CEFAS, the government scientific advisor and recipient and analyst of the fishery's catch information, who has also been involved in the Harvest Strategy design. SG80 is met.
Progress status	This condition was 'closed' at year 4	
Carrying over condition <input type="checkbox"/>	No	

Closing the condition during the reassessment	No - The information received at the year 4 surveillance audit site visit confirmed that the information base was suitable to close this condition.
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PI 1.2.1 - condition 7.

Performance Indicator	1.2.1	
Score	70	
Justification	<p>The MSC definition of a Harvest Strategy is the combination of monitoring, stock assessment, harvest control rules and management actions, which may include a management plan. Monitoring of stock status is considered under 1.2.3 to be adequate for management needs, but there is no analytical stock assessment and RBF has been used to assess stock status (1.2.4 default score 80). Harvest control rules are considered under 1.2.2. There is no explicit management plan, and the EC does not set a TAC for this stock.</p> <p>However, a harvest strategy for sardine is implied under the CFP for all European stocks: to be maintained at levels that can support MSY. To reach this goal there are specific management measures in place: a minimum landing size, technical gear and vessels specifications and limits, and closed areas. Whilst there are no reference points for this stock, preliminary qualitative advice has been given. Quantified advice can be provided by ICES which, when available, will be based on the precautionary approach, which can be inferred to aim for MSY and avoid limit reference levels (i.e. historically low SSB and an increase in F). SG60 is met.</p> <p>SG80 requires that the harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points. There is no analytical assessment responsive to the state of the stock, and no reference points. However, it is not certain that management responds to ICES advice in relation to the state of the stock as there is no TAC and advice has not been given by ICES for this stock. As such the SG 80 level is not met.</p> <p>This finding is the same as during the most recent reassessment.</p>	
Condition	By the 4 th -1 st reassessment surveillance audit there should be clear evidence that the harvest strategy is responsive to the state of the stock and elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	
Condition start	PCR 2017 amended in 2019	
Condition deadline	Year 4-1 of reassessment	
Milestones	Year 4-1 of reassessment: By the 4 th -1 st reassessment annual audit, the fishery shall continue to demonstrate that the harvest strategy is responsive to the state of the stock and the policy changes agreed in 2018 (See condition 8 (PI 1.2.2) below) have been formally accepted by the relevant managers, with clear evidence of the implementation of the agreed harvest control rules.	
Progress on condition	Year 2	<p>The Client has made acceptable progress in regard to this condition.</p> <p>All 15 members have adopted the 2018 and 2019 CoC, which stipulates members to support CEFAS as they examine possible HCRs and HS with ICES. Such support has included making data available to CEFAS from their logbooks, as well as carrying at-sea observers when requested. Further, members have encouraged</p>

		<p>CEFAS to bring their findings and recommendation on an HCR to ICES for review and adoption. In the interim CSMA and its members have adopted their own strategy, within their CoC, to keep removals in line with scientific advice as provided by ICES. As ICES advice is not yet available for 2019, CSMA has used advice provided by CEFAS until new ICES advice is given.</p> <p>The Client, through their CoC, have agreed to monitor both the fishery's within year performance and the latest ICES advice. They have also pledged to make adjustments, as needed, to reduce harvest. These adjustments, if necessary, will be conducted during their January or October meetings. Until official ICES advice is given, members have also adopted a conservative individual vessel quotas which, when summed, are less than the HR of 20% as proposed by CEFAS as a sustainable rate of exploitation (Carpi et al. 2019).</p> <p>The Client has engaged with fishery management personnel in the UK, as well as industry members in other subarea 7 sardine fisheries, to begin the process of harvest strategy development as evidenced by email traffic and official letters.</p> <p>Given the information presented progress on this condition is on target.</p>
	Year 3	<p>The Client has made acceptable progress in regard to this condition.</p> <p>As detailed in Year 3 report CSMA members agreed through an HCR vote to apply a catch limit of 10,048 t for 2019 which was distributed through the members based on the previous year catches plus an uplift of 20% based on the PELTIC survey estimates for 2019 (CEFAS 2019). The CSMA maintained monthly catch emails during 2019 which detailed the year to date landings to all members to allow evaluation against the catch total. CSMA initiated a pooling of uncaught 'quota' in December making this available to other members based on the agreed HCR vote from the start of the season. The CSMA total landings for 2019 was 6,405 t of the catch limit of 10,048 t (63.7%). In 2017 ICES (2017b) advised that catches in 2018-2019 should be reduced by 20% relative to the 2014-2016 average (= 34,364 t based on ICES landings), based on an ICES category 5 decision rule for data deficient stocks. The UK, with CSMA accounting for ~95% of the UK catch, remains the principal Member State fishing the stock taking 10 times the tonnage compared the next closest Member State (Netherlands in 2018). The UK recorded 78.2% of all ICES landings in 2018 (ICES 2019a) with an average of 55% over the past 9 years. As reported in Year 3 report landings by Member States for 2018 are available from ICES and show official landings of 17,373 t from the stock area in 2018 with ICES landings totalling 10,412 t (ICES 2019a). These 2018 ICES landings of 10,412 t (Table 4) are somewhat beneath this advised level, although it's noted the caution ICES places on the landing figures. Notwithstanding this the total of ICES landings of 10,412 t and the official landings of 17,373 t remain 50% of the ICES advice for this year (34,364 t based on ICES landings). This provides clear evidence that catches are in line with ICES advice</p> <p>For 2019, ICES catches are not yet available. The CSMA catches of 6,405 t in 2019 conservatively could account for 55% of the ICES landings (on the 9 year average). Based on this figure and track records across Member States in the past decade it is highly unlikely that the ICES advised landing for 2019 of 34,364 t will be approached, suggesting again that catches were within ICES advice for 2019.</p>

		<p>For 2020 there is no ICES advice on landings (ICES 2019b), and therefore the principal harvest control tool of the harvest strategy for the stock and the CSMA will be the catch limit set by CSMA at the Annual General Meeting in July 2020.</p> <p>Other key elements of the harvest strategy have continued to be updated and developed through 2019 are: stock status, monitoring and stock assessment.</p> <p>CEFAS has continued to monitor of the stock through the PELTIC survey and stock index for 2019 shows improvement from previous estimates see Year 3 report (ICES 2019b; CEFAS 2019). The self-sampling research program conducted by CSMA has continued through 2019-2020 (4th year) and CEFAS have presented a report on the initial findings (CEFAS 2020a). The stock has been selected for an ICES benchmark event in 2021 and at that benchmark, the PELTIC survey series as well as several proposals for HR control rules will be formally assessed and the most appropriate approach selected for future assessments.</p>
Year 4		<p>The MSC definition of a Harvest Strategy is the combination of monitoring, stock assessment, harvest control rules and management actions, which may include a management plan.</p> <p>The sardine stock in subarea 7 is a non-quota stock with annual catches driven by market needs, opportunistic fishing encounters and in the case of sardine fishery in Seine Bay (7d) it has been closed for human consumption since 2010 due to PCB contamination. The CSMA remain the only participants in the fishery, which target the stock annually and are responsible for the majority share of catches from the stock (Table 11) up to 87% (2019) averaging 65 %. GSA2.4 of the FCR2.01 outlines four key elements to informal approaches to scoring this PI - Harvest Strategies relevant to this fishery. These are:</p> <ul style="list-style-type: none"> • <i>The assessment should factor in the likelihood of changes within the fishery that could potentially lead to an increase in the risk of impact from fishing activity over time.</i> • <i>Teams should further consider how elements of the strategy are combining to ensure that the fishery is moving in the desired direction or operating at a low risk level and that qualitative or semi-quantitative objectives are being achieved.</i> • <i>There should be evidence that the expected objectives are being achieved. Evidence may be demonstrated through local knowledge or research.</i> • <i>CABs should determine the extent to which there is feedback and learning mechanism to inform the harvest strategy on an ongoing basis. Depending on the scale of the fishery this could be through informal stakeholder processes that are based on local knowledge of the fishery or any other less subjective review process.</i> <p>Monitoring of the stock status is considered adequate for management needs as evaluated by ICES in the 2021 benchmark (ICES 2021a). There is fishery-independent survey data, which monitors the total biomass of the stock and through the UoA, there is a self-sampling program that provides fishery dependent length-frequency data and discard into the assessment process, although the time-series of this is weak at present and prevents its use in the</p>

current assessment (CEFAS 2020a). Catch data is reported by all EU member states under the requirements of the Common Fishery Policy (CFP) and by the UK as part of its UK MoU with ICES (UK 2021a). Catch information is variable over time by member state and it is not clear if this variability was caused by the opportunistic nature of some fleets or by misreporting (ICES 2021a).

The stock as of 2021 is considered a Category 3 stock by ICES and stock assessment advice will now be given on an annual basis. The first of this Category 3 advice was published in December 2021 (ICES 2021d). As part of a Precautionary Approach to provide advice on the status of the stock and exploitation, the 1 over 2 rule is considered the most adequate method to assess this stock at the moment (ICES 2021a) and the 2021 advice is based on this method (Figure 21). This rule is defined as advice on fishing opportunities for the coming year(s), is based on the recent advised catch (or landings) adjusted to the change in the stock size index for the single most recent value relative to the two preceding values (ICES 2018). Using the 1 over 2 rule as an HCR, and retrospective analysis, the advised catches in the total area for 2020 based on this proposed HCR would have been 27,000 t, whilst landings were ~ 11,000 t (Figure 21). The 2021 advised catch based on the proposed HCR was ~27,000 t for the total area. It should be noted that using the 1 over 2 rule as a HCR has been in combination with the 80% symmetrical uncertainty cap and biomass safeguard, however, can result in reductions of catches and ICES consider in the long term that using the F_{MSY} obtained from a surplus production model or a sustainable constant harvest rate determined by an MSE, are the preferable methods to provide advice in the long term (ICES 2021a).

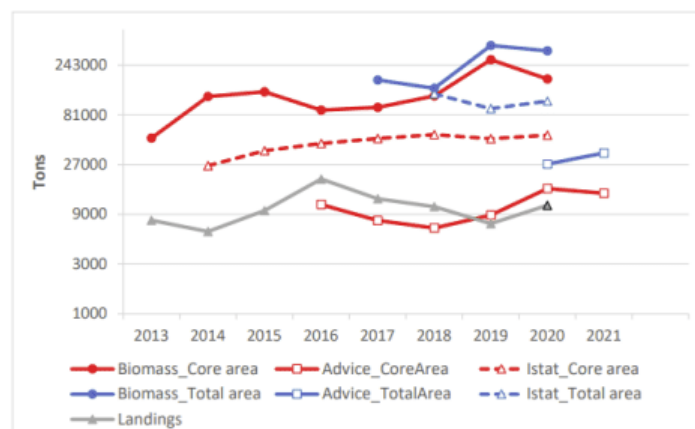


Figure 62. Simulation of advice resulting from applying the 1 over 2 rule with a 80% uncertainty cap with a retrospective character. The rule has been applied using both the biomass trend derived from the total area and the core area. The biomass and I_{stat} values from total area and core area are also represented. Note the y-axis is in a logarithmic scale. Source: ICES (2021a).

The HCR proposed by ICES has been formally presented for the stock in the December 2021 advice (ICES 2021d) and advised catches are 6906 t although there is no catch limit control on the stock at the EU or UK national level.

The CSMA is the only fleet targeting the stock on an annual basis and in the absence of a fishery wide harvest strategy and HCR tool for the stock they have developed their own including an agreed annual harvest limit for the fleet since 2018. The CSMA harvest strategy is enacted through their CSMA Code of Conduct

		<p>(CoC) which all members sign annually. The specific harvest rules included a cap on vessel licenses (15), vessel size limit (15 m) and headline length (450 m). All 15 members of the CSMA have met at least yearly (typically October and January) to examine overall fishery performance, get updates from CEFAS, and set vessel specific fishing quotas. The mesh size used by the fishery is on average 20 mm with some operators operating slightly larger meshes. The legal requirement is 16 mm (HM 2019b). In addition there is a minimum size limit (Minimum Conservation Reference Size) of 11 cm in UK waters applied through a statutory instrument in the UK.</p> <p>For the 2019-2020 season a Harvest Control vote by the CSMA was undertaken in July 2019 as part of the Annual General Meeting (AGM). This resulted in an agreed (9 in favour, 1 against, 1 no response) adoption of catch limits and pool system for the period 1st July 2019 to 31st December 2019. ICES advice recommend a total catch not exceeding 34,364 t across all fisheries. The CSMA adopted the following approach to set a catch limit for the UoA. The CSMA used the 20% Harvest Rates (HR) control rule proposed by CEFAS. The CSMA applied the following methodology to set a total CSMA catch limit:</p> <ul style="list-style-type: none"> • 20% harvest rate of the estimated biomass (145,514 t) for the PELTIC 2018 survey year = 29,103 t. • Calculate UK average catch percentage from 2010-2018 ICES data = 55.3% • 55% of 29,103 t gives a value of 16,007 t • CSMA take 95% UK catch so the CSMA used 95% of 16,007 t = 15,206 t as the maximal catch for the fleet for the year. This is the start value from which the harvest control discussion at CSMA was derived. • For 2019 the CSMA then agreed a catch limit of 10,048 t for the season which is 5,158 t lower than the maximal catch. This value was based on the basic agreement of a minimum of 400 t per vessel. With an uplift of 20% for those vessels actively catching near their 2018 allocation. • The agreed total catch was to be reviewed in November 2019 to allow reallocation of unused catch back into the pool for all vessels who had not reached 75% of their allocation. <p>In 2020, on review of the PELTIC survey data for 2019 the total biomass estimate from the survey increased to 375 kt the highest on record (CEFAS 2019) and in the absence of new ICES advice (as a category 5 stock at the time the advice was biannual) CSMA voted to maintain the catch limit of 2019 at 10,048 t. Similarly in 2021, with a biomass estimate at 332,098 t (CEFAS 2020b) the annual general meeting (AGM) voted and implemented a pooled catch limit at 10,483 t for 2021, with a review catch limit in November when the new ICES advice (based on the WKWEST outputs (ICES 2021a)) will be issued. The CSMA also agreed to maintain a monthly review of catches internally to monitor against the limit.</p>
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	<p>The CSMA in consultation with CEFAS agreed on a new Harvest Control Rule (HCR) for the Sardine stock in Subarea 7. This HCR will be used for the period 2022-2024 or until a new ICES process of formulating the advice is agreed (whichever is soonest). The HCR will be re-evaluated by CSMA and Cefas after that period.</p> <p>Each calendar year:</p> <ol style="list-style-type: none"> 1. The CSMA will set an annual catch limit for the CSMA fleet based on catch history of the CSMA as a proportion of the overall catch of the stock over the preceding 3 years. 2. The CSMA will consult with Cefas if the proposed CSMA catch limit is sustainable and point 3 will be followed. 3. Cefas will evaluate if the proposed catch limit meets the following points: <ol style="list-style-type: none"> i. likely maintain the overall exploitation rate below F_{MSY}; and ii) not likely lead to an overall exploitation rate which would reduce biomass to approach the point of recruitment impairment. <ol style="list-style-type: none"> a. If Cefas agree that the CSMA proposed catch limit as laid out under Point 3.i-ii are met, then then the proposed harvest rate will be offered to members for acceptance as the CMSA catch limit for the forthcoming calendar year. b. If Cefas consider that the CSMA proposed catch limit as laid out under Point 3.i-ii are not met, then CSMA will adopt a catch level advised by Cefas which ensures that Point 3.i-ii is met or will follow the ICES HCR, whichever is higher. 4. Where a reduction in catch limits is required by the CSMA under 3.b., the CSMA may choose to limit catch reductions by a maximum of 10% of the previous year's catch limit. This is to avoid large reductions in catch which may have severe socioeconomic impacts in the fishery and could lead to the fishery failing to meet the fishery objective for economic sustainability. Under this scenario the CSMA will request that Cefas evaluate any proposed decrease with respect to whether the reduction can be expected to reduce F below F_{MSY} within a reasonable time frame relevant to the stock. Once a catch limit is agreed between Cefas and CSMA, the proposed harvest rate will be offered to members for acceptance as the CMSA catch limit for the forthcoming calendar year. <p>CSMA members continue to closely analyse ICES annual assessments in relation to stock status together with CEFAS scientist reports and CEFAS have informed CSMA on developing their catch limit. In the event the ICES recommendations require modifications on the exploitation of the resource, there is evidence that CSMA members agree to adapt their management framework, respecting the scientific advice to maintain sustainable catch limits. Additionally, the CSMA participate actively with scientific works to promote understanding of the sardine stock. The continued commitment of CEFAS scientists to work with CSMA provide the fishery with the capacity to implement these measures and assess the response of these actions in the fishery.</p> <p>With respect to the four key points identified in GSA2.4 it can be said that:</p> <ul style="list-style-type: none"> • The new stock assessment (WKWEST) and annual monitoring, both fishery independent and dependent, account for of changes within the fishery over time. The major risk here would be regular targeting by non-UoA fleets on the stock. This is accounted for by the annual reporting by member states, the new annual stock assessment process and in terms
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		<p>of the UoA would be reviewed as part of their annual AGM and the UoA catch share.</p> <ul style="list-style-type: none"> The fishery can be considered to be moving in the desired direction through the UoA led self-sampling program, the progression to ICES category 3 stock status and that the objective of maintaining the stock above MSY is being achieved (see PI1.1.1). ICES also indicate that there is plan for development of the HCR in the long-term through using the F_{MSY} obtained from a surplus production model or a sustainable constant harvest rate determined by an MSE, which are the preferable methods to provide advice in the long term (ICES 2021a) The evidence that the expected objectives are being achieved is evident in the WKWEST benchmark and shown in Figure 21. There is a feedback and learning mechanisms shown in the fishery which is informing the harvest strategy on an ongoing basis. The UoA are in regular contact with the fishery scientists, participate in the fishery dependent research. The CSMA have a monthly and within season (November) meetings planned to review catches and have been shown to annually review their catch limit with reference to the latest advice whilst agreeing actions with the relevant authorities. <p>On the basis of the above the assessment view that SG60 and SG80 are met, but the lack of an overall 'design' to the harvest strategy and the lack of an HCR for all vessels SG100 is not met.</p>
Progress status	This condition was 'closed' at year 4	
Carrying over condition <input type="checkbox"/>	No	
Closing the condition during the reassessment	No - The information received at the year 4 surveillance audit site visit confirmed that the information base was suitably adequate to close this condition.	

PI 1.2.2 - Condition 8.

Performance Indicator	1.2.2a
Score	60
Justification	<p>1.2.2a - There are no reference points and no TAC currently implemented for the sardine stock in Subarea 7. When this UoA was part of a larger harmonised fishery which included both French and Spanish fisheries, all three parties agreed to adjust catches in line with ICES advice (Cieri et al. 2017), and together this made up the majority portion of the catch (~90%). With the change in ICES stock advice the CSMA fishery accounts ~ 57.2% of the catch in Subarea 7 per annum (5 year average with range of 51.1% to 76.1%, when French catches are removed based on their redistribution to Subarea 8 by ICES), while the remainder of the catch is from non – MSC participants either as bycatch or opportunistic catch which varies between Member State fisheries year on year (see Figure 4, section 2.2.2). The CSMA currently have specific harvest rules included through the CSMA Code of Conduct which all members must sign; the updated version of this for 2017 includes a cap on vessel licenses (15), weekly catch</p>

limits (210 t), vessel size limit (15 m) and headline length (450 m) (CSMA 2017a). CSMA members have agreed to closely analyse ICES annual assessments in relation to stock status together with CEFAS scientist reports (ICES 2017f; Cieri et al. 2017; Carpi & Kooij 2018). In the event the ICES recommendations require modifications on the exploitation of the resource, CSMA members agree to adapt their management framework, respecting the scientific advice to maintain sustainable catch limits. This is actioned through the CSMA Code of Conduct. Additionally, the CSMA participate actively with scientific works to promote understanding of the sardine stock.

The critical question for the HCRs adopted by the CSMA is whether they have sufficient leverage over the stock to sufficiently reduce exploitation rate as LRPs are approached based on this fishery being the dominant and most regular source of fishing mortality of the stock. Where the risk for this stock is population size and fishery mortality (CC3.1.5) (Appendix 2. RBF). The measures in place within the management of the CSMA clearly meet the guidance provided in GCB2.6 (FR 1.3) for assessing HCRs in informal approaches including temporal limits (weekly catch). The continued commitment of CEFAS scientists (those scientists responsible for the stock survey) to work with CSMA provide the fishery with the capacity to implement these measures and assess the response of these actions in the fishery. This can be monitored and amended during the course of the certificate to ensure the harvest rules are effective across the entire stock. Furthermore, the agreement signed by the CSMA members to reduce exploitation in-line with ICES advice if the stock declines formalises the fishery's HCR within the context of the HS. The management leverage available to the CSMA and CEFAS, is of a similar percentage to other MSC certified fisheries without 100% HCR management coverage (Walker Seafood Australian swordfish longline (57-73%), PNA Western and Central Pacific skipjack, unassociated / non FAD set, tuna purse seine (55% - 68%)). The scoring of this PI for fisheries without complete management leverage over the stock has been tested via an objection (Banks et al. 2011). In the adjudication, no decision was taken as to the minimum percentage of the catch allowing sufficient management leverage, but the scoring of the CAB (SG60 met, SG80 not met) was upheld on the basis of a percentage of the total catch in the range 55% - 68% (as noted above), as long as the issue was addressed by the condition and CAP (see Banks et al. (2011), page 764). Since this situation is precisely analogous to the situation here, the CAB concluded that SG60 is met.

However, the HCRs which would be used to reduce exploitation rate are not well-defined as the stock at present is improving and not near LRPs therefore the SG 80 level is not met;

NOTE: this is a reduction in scoring from the reassessment in 2017.

1.2.2b - The main uncertainties in the fishery are resultant of the lack of historic fishery independent and dependent data from the entire Subarea 7 region and consequently there is no analytical assessment for this stock. During the reassessment in 2017, the three harmonized parties (CSMA, French and Spanish fisheries) agreed to a HCR to limit removals based on ICES advice. With the reapportioning of the Subarea 7 sardine as its own stock, the agreement is no longer valid. Additionally, ICES has provided only qualitative, rather than quantitative advice further limiting the HCR effectiveness in providing a precautionary framework for management. As such this guidepost at SG 80 is not met.

NOTE: this is a reduction in scoring from the most recent reassessment in 2017.

1.2.2c - The recent study by Carpi and Van der Kooij (2018), the results of the PELTIC survey, as well as low risk from the PSA indicated a positive status for this stock. This suggest that the tools in use can be, and have been, effective in the recent past. As such the SG 60 level is met. However, the recent dramatic increase in landings by the Cornish as well as other fisheries (in 2016) indicate that the current tools may not be effective in reducing exploitation or removals in response to local increases in abundance within the year.

	<p>However, despite this increase in landings the stock seems relatively robust suggesting that the harvest control measures in place have been beneficial both stock wide and locally. As such the SG 60 level is met, as the evidence of “some success” can be measured by the stock’s current status</p> <p>Lacking an analytical assessment with clear reference points and an appropriate level for fishing mortality precludes the stock from meeting the SG 80 level, as there are not set exploitation levels to be achieved.</p> <p>NOTE this is a reduction in scoring from the last reassessment in 2017</p>	
Condition	By the 4 th -1 st reassessment surveillance audit well-defined HCRs should be in place which reduce exploitation rate as limit reference points are approached. These need to take into account the main uncertainties and be appropriate for the control of exploitation rates	
Condition start	PCR 2017 amended in 2019	
Condition deadline	Year 4-1 of reassessment	
Milestones	Year 4-1 of reassessment: By the 4 th -1 st reassessment annual audit, the fishery shall continue to demonstrate that the harvest strategy is responsive to the state of the stock and the policy changes agreed in 2018 (See condition 8 (PI 1.2.2) below) have been formally accepted by the relevant managers, with clear evidence of the implementation of the agreed harvest control rules.	
Progress on condition	Year 2	<p>At the Second Year Audit the Client has made good progress on this condition. All 15 members have met at least yearly (typically October and January) to examine overall fishery performance, get updates from CEFAS, and set vessel specific fishing quotas. All members have signed the CoC (reference 2018 & 2019 CoC, appendix 5.3 and 5.5) for both 2018 and 2019. Individualised vessel catch limits were enacted through the CoC for the July-Dec season of 2018 totalling 8,303 tonnes. Of this amount, only 5,643 tonnes or 68% had been utilized; but did require some (3) UoC vessels to end fishing when their individual quotas were reached. Total UK catch for 2018 was ~8,000 t.</p> <p>UoC vessels plus other states landings totalled 17,396 tonnes for sub-area 7. While this is higher than the amount suggested by ICES (2017b), it is in line with the new more detailed information and analysis provided by CEFAS (Carpi et al. 2019). ICES (2017b) advised that catches should be reduced by 20% from the 2014-2016 average, but this advice was based on an ICES category 5 decision rule for data deficient stocks (previous years catches (2014-2016) and applies to that a negative 20% precautionary buffer. The more recently CEFAS (Carpi et al. (2019) based on survey and catch data, has suggested catches in 2018 could have been as high as 31,758 t and still been under the 20% HR proposed control rule. CEFAS have proposed HR rules based on ICES simulation modelling of small pelagic species and a ‘1-over-2’ rule in which the advice is based on a comparison of the most recent index value with the 2 preceding values, combined with recent catch or landings data (ICES 2019b). CEFAS is in the process of having its methodology review by ICES for sardine, which is anticipated to happen later this year or early in 2020 and if approved could aid in setting realistic removals using HR and the PELTIC survey.</p> <p>For 2019 all 15 members have agreed through the 2019 CoC to set vessels quotas totalling 10,000 tonnes (2019 CoC Appendix 5.5); well within the proposed 31,758 tonnes using a 20% HRC if catches and share of catches by all fisheries from 2018 to 2019 are kept constant. CSMA take on average > 50% of the total catch once</p>

		<p>the French catches are portioned to subarea 8. CSMA have additionally agreed to monitor fishery performance of non-UoC fisheries, and the scientific advice from either ICES or CEFAS and adjust as appropriate to keep in line with stock status and advice; and avoid overfishing the resource.</p> <p>Additionally, UoC vessels have supported CEFAS sample collection and at-sea observation efforts by collecting samples, carrying observers, and filling out logbooks as required. They have engaged with both fishery managers and other fisheries on sardines in an effort to increase awareness and to sustainably manage removals (reference letter Robert Goodwill provided to the assessment team). A long-term management plan for the sardine fishery in Areas 7 may be delayed until the Brexit process concludes. However, progress has still been made by the Client as evidenced by emails presented during the surveillance process.</p> <p>Given this progress, this condition is deemed ahead of target as all of Year 2 and some of Year 3 goals have already been met.</p>
	Year 3	<p>Steps taken by the CSMA to develop a well-defined HCR include:</p> <ol style="list-style-type: none"> 1. CSMA members agreed HCR vote to apply a catch limit of 10,048 t for 2019. 2. This catch limit was devised as per Year 3 report and was evaluated against ICES catch advice and used the latest information from CEFAS survey data to ensure it was precautionary. 3. The CSMA maintained monthly catch emails during 2019 which detailed the year to date landings to all members to allow evaluation against the catch total. 4. CSMA initiated a pooling of uncaught 'quota' in December making this available to other members based on the agreed HCR vote from the start of the season. <p>The HCR vote took place after the Code of Conduct was issued and was agreed via email. The Code of Conduct does not currently specify the terms of the HCR or how the decision will be undertaken, and this is one line of evidence that still requires to be addressed. It does specify that CSMA member will not exceed any HCRs put in place however (appendix 4.1). Details of the proposed HCRs for the 2019-2020 were outlined in the minutes from the AGM in 2019 and email evidence of the vote and agreement following the meeting were provided to the CAB as part of this audit. This provides evidence that a CSMA is in place and responsive to the stock, but not yet well-defined.</p> <p>Continued Brexit negotiations in 2020 are preventing further discussion with other Member State fisheries who have sporadically targeted sardine in the past. Until there is a clear idea of EU access to UK waters and the terms of that access any further agreement between fisheries is on hold.</p> <p>No external review of the HCR has yet been undertaken, but with the stock undergoing ICES benchmark in 2021, CEFAS have indicated that HCR evaluation and discussions will take place then.</p>
	Year 4	<p>The sardine stock in subarea 7 is a non-quota stock and whilst there are technical measures for vessel power/ gear types / mesh sizes associated with vessels which</p>

	<p>target this stock in the EU (EU 2019b) and UK (HM 2019) there are no HCRs from the jurisdictions which can be considered as to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached. As noted in PI1.2.1 the CSMA remain the only participants in the fishery which target the stock annually consistently and are responsible for the majority share of catches from the stock (Table 11) up to 87% (2019), with a 5 year average of 59%.</p> <p>The stock as of 2021 is considered a Category 3 stock by ICES. As part of a Precautionary Approach to provide advice on the exploitation a stock status a responsive HCR (the 1 over 2 rule) now in place based on a comparison of the most recent index value with the 2 preceding values (ICES 2021a; ICES 2018). However, there will be no implemented HCR tool associated with this.</p> <p>In the absence of a stock wide HCR tool capable of responding to exploitation rate, the CSMA implemented an annual catch limit to the fleet in 2017 and ensured all members agreed to it through the CSMA Code of Conduct. In response to the PELTIC survey data, for the 2019-2020 season the CSMA used a 20% Harvest Rates (HR) control rule as advised by CEFAS as a baseline for setting their catch limit. The CSMA applied the following methodology to set a total CSMA catch limit:</p> <ul style="list-style-type: none"> • 20% harvest rate of the estimated biomass (145,514 t) for the PELTIC 2018 survey year = 29,103 t. • Calculate UK average catch percentage from 2010-2018 ICES data = 55.3% • 55% of 29,103 t gives a value of 16,007 t • CSMA take 95% UK catch so the CSMA used 95% of 16,007 t = 15,206 t as the maximal catch for the fleet for the year. This is the start value from which the harvest control discussion at CSMA was derived. • For 2019 the CSMA then agreed a catch limit of 10,048 t for the season which is 5,158 t lower than the maximal catch. This value was based on the basic agreement of a minimum of 400 t per vessel. With an uplift of 20% for those vessels actively catching near their 2018 allocation. • The agreed total catch was to be reviewed in November 2019 to allow reallocation of unused catch back into the pool for all vessels who had not reached 75% of their allocation. <p>In 2020, on review of the PELTIC survey data for 2019 the total biomass estimate from the survey increased to 375 kt the (highest on record) (CEFAS 2019) and in the absence of new ICES advice (as a category 5 stock at the time the advice was biannual) CSMA voted to maintain the catch limit of 2019 at 10,048 t. Similarly in 2021, with a biomass estimate at 332,098 t (CEFAS 2020b) the annual general meeting (AGM) voted and implemented a pooled catch limit at 10,483 t for 2021, with a review catch limit in 2022 when the new ICES advice (based on the WKWEST outputs (ICES 2021a)) will be issued. The CSMA also agreed to maintain a monthly review of catches internally to monitor against the limit.</p>
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	<p>It can therefore be said that a generally understood HCR is in place for the CSMA since 2019.</p> <p>That the catch limit in 2019 was based on a 20% harvest rate advised by CEFAS and the method of catch limit setting was documented and below the harvest rate suggests it can also be considered well-defined. There is recorded review and agreement of the HCRs in 2020 and 2021 which reference to this original catch limit and the current stock status suggests the HCR is precautionary and would reduce exploitation as PRI is approached.</p> <p>The code of conduct signed by the CSMA members each year based on the latest advice (CEFAS or ICES) formalises the fishery’s HCR within the context of the HS. Evidently as the CSMA fleet does not constitute the entire subarea 7 sardine fishery which could target the stock there is a question as to whether the leverage associated with the CSMA catch limit is sufficient to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.</p> <p>The management leverage available to the CSMA, is of a similar percentage to other MSC certified fisheries without 100% HCR management coverage (Walker Seafood Australian swordfish longline (57% - 73%), PNA Western and Central Pacific skipjack, unassociated / non FAD set, tuna purse seine (55% - 68%)). The scoring of this PI for fisheries without complete management leverage over the stock has been tested via an MSC objection (Banks et al. 2011). In the adjudication, no decision was taken as to the minimum percentage of the catch allowing sufficient management leverage, but the scoring in that objection (SG60 met, SG80 not met) was upheld on the basis of a percentage of the total catch in the range 55% - 68% (as noted above), as long as the issue was addressed by the condition and CAP (see Banks et al. (2011), page 764). This situation is analogous to the situation here and the 2017 expedited audit of this fishery raised a condition on this SI under V1.3 of the MSC standard (Jones et al. 2018). Therefore SG60 is met</p> <p>The CSMA HCR and catch limit has been in place since 2018 based on a 20% harvest rate of the estimated biomass and this has been considered precautionary by CEFAS. It has been reviewed annually by CSMA and has maintained the $F < F_{MSY}$. It is therefore in place and will ensure the exploitation rate will increase (20% harvest rate of the estimated biomass) as reference points are approached. The ICES benchmark of 2021, suggested that the proposed 1 over 2 rule HCR would have advised catches of 27,000 t in 2020 which would maintain the stock ~MSY (Figure 21). With the CSMA catch limit of 10,048 t and with >50% of the catch it can be said that the CSMA in place at the time was capable of maintaining the stock at MSY. SG80 met.</p>
Progress status	This condition was ‘closed’ at year 4
Carrying over condition <input type="checkbox"/>	no
Closing the condition during the reassessment	No - The information received at the year 4 surveillance audit site visit confirmed that the information base was suitable to close this condition.

PI 2.2.3 - condition 9.

Performance Indicator	2.2.3	
Score	65	
Justification	<p>b. Information on bycatch/discards is adequate to broadly understand outcome status of discarded/slipped fish, through a long time series of data from completed CSMA log-sheets and high survivability studies (Catchpole et al. 2015). SG60 is met However, the fishery is not awarded a score of 80 as there are significant issues with inconsistent reporting and it is noted that it is difficult to estimate the quantity of fish slipped from the net and skippers cannot always indicate which species they have slipped. SG80 is not met.</p> <p>c. Discarding from the fishery is rare and of low volume based on completed logbook forms from the UoA. The main source of bycatch in the fishery is slippage of which survival rate is high for sardines (slipped when too-small or overcaught) and acceptable for other stocks (herring, mackerel) when the CSMA slippage policy is applied (Catchpole et al. 2015; CSMA 2017b). The information on slippage survival is adequate to support the CSMA slippage policy and the CSMA Code of Conduct (CSMA 2017a): <i>'Members shall endeavour to ensure their fishing activities prevent overfishing and excess fishing capacity and not lead to more fish being caught than can be safely carried by the available vessels. Skippers shall communicate with nearby vessels at every opportunity to manage larger catches. In the event of an excessive catch which cannot be shared with another vessel, fish in the net should be released alive at the earliest possible point in the fishing operation.'</i> Therefore, SG60 is met. Slippage catch composition is estimated by skippers and subject to uncertainty and is sometimes slipped based on unwanted catch composition, therefore is likely to vary from landed data and these will not be comparable for composition. Furthermore, the issues with inconsistent reporting of slippage are noted along with the difficulty in estimating the quantity of fish slipped from the net. SG80 is not met.</p> <p>d. The fishery does not meet SG80 as sufficient data are not collected for all vessels in CSMA logsheets to detect any increase risk to bycatch species.</p>	
Condition	By the 4th ^{1st} reassessment surveillance audit information from logbooks must be sufficient to estimate outcome status of bycatch species with respect to biologically based limits and to support a partial strategy for management	
Condition start	Year 1 - 2018	
Condition deadline	Year 4-1 of reassessment	
Milestones	Year 4-1 of reassessment: analyse data to assess any trends in slippage and discards.	
Progress on condition	Year 2	<p>Logbook revisions were made for the 2018/19 and the sample of logbooks examined by the assessment team were all complete in terms of slippage and discarded catches including 'zero' where required. In addition as detailed in the year 2 audit report the CSMA have taken independent observers in 2018. The observer report recorded bycatch information and found that on 4 of the 15 hauls small bycatches of mackerel (estimated at 1 – 5% of catch) were present. No other bycatches were reported.</p> <p>With the addition of 2018 logbook data, observer report and previous information about the fishery, the team considered whether this condition could be closed</p>

		<p>out at this surveillance audit. However, given that the observer data only had 13 trips in 2018 and didn't include those vessels operating in the east (Plymouth etc.) the team felt that an additional year of data was required for assurance.</p>
	Year 3	<p>The SMRU report (the fishery independent observer programme) has been presented providing details of the observer programme and the interaction levels for the season. This meets the milestone requirement.</p> <p>Logbook revisions made in Year 2 have been continued in 2019 (year 3). Compliance overall is good, but three vessels appear not record slippage and discards, reducing the adequacy of the information base. Corrective actions from the CSMA have been put in place to address this (see section and Appendix 4.4 in year 3 surveillance report). Discard data from logbooks has been assessed with results highlighted within a summary spreadsheet (reproduced in year 3 surveillance report).</p>
	Year 4	<p>The information base available for consideration under this component has increased in adequacy since the condition was raised. At the Year 4 audit the following information sources were available:</p> <p>Logbook records from the CSMA fleet – including discard and slippage events - Logbook compliance for the fleet for discard species is reasonably complete for this component;</p> <p>Observer records of catch profiles (4 years) confirm the clean nature of the catches and the low occurrence of discard species;</p> <p>Fisheries Science Partnership (FSP) program data – self reporting with external verification during the course of the program.</p> <p>Qualitative and quantitative information (completed logbooks by the majority of the fleet are available on discard species and summary statistics produced by the CSMA statistician on an annual basis along with the FSP project (CEFAS 2020a). Which enables the assessment team to determine that there are no main discard species.</p> <p>The FSP study suggested that discarding was low: only 3 discarding events were reported by two skippers during the peak of the fishing season, with the overall discard volume for the fishing season estimated to be less than 2 tonnes. The study also reported that slippage was of low frequency not exceeding once a month per vessel, totalling > 5% of catch (Carpi & Kooij 2018).</p> <p>Observer records highlight the clean nature of the catch composition providing third party independent verification of the catch profiles.</p> <p>Based on this increased evidence base the assessment team have rescored the PI.</p>
Progress status	This condition was 'closed' at year 4	
Carrying over condition <input type="checkbox"/>	no	
Closing the condition during the reassessment	No - The information received at the year 4 surveillance audit site visit confirmed that the information base was suitable to close this condition.	

PI 2.3.2 - Condition 10.

Performance Indicator	2.3.2c - There is evidence that the strategy is being implemented successfully (FR1.3)
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Score	75	
Justification	Independent (but now outdated) observations by CEFAS and SMRU have observed no cetacean mortalities in the fishery, highlighting the low encounter rate (Northridge et al., 2007; Northridge et al., 2011; Northridge et al., 2015; Personal Communications, Tom Catchpole, CEFAS, 16 October 2015). However, there is not clear evidence that the strategy is being implemented successfully as the CSMA log-sheets appear to be incomplete for the 2016-17 season, and there is no regular observer coverage or verification of CSMA log-sheets that would provide clear evidence. SG80 is not met	
Condition	Record and analyse any cetacean, pinniped (seal) or seabird mortalities within CSMA logsheets.	
Condition start	Year 1 – reassessment (2018)	
Condition deadline	Year 4 Year 1 – reassessment (2023)* accounting for MSC derogation 6 one year extension to existing condition.	
Milestones	<p>As per condition 3</p> <p>By 2nd annual audit, ensure that the CSMA logbooks are being fully completed by all members for ETP species.</p> <p>By 3rd annual audit implement a new independent observer programme.</p> <p>By 4th Year 1 annual surveillance audit* analyse data to assess any trends in mortality (if any mortality has been observed).</p> <p>*accounting for MSC derogation 6 one year extension to existing condition.</p>	
Progress on condition	Year 2	<p>Logbook revisions to include seabird / seal and dolphin catches were made for the 2018/19 season (appendix 5.1) and the sample of logbooks examined by the assessment team were all complete in terms of ETP catches including ‘zero’ where required. In addition as detailed in the year 2 audit report the CSMA have taken independent observers in 2018 with the results of these providing verification of the low ETP encounter rate and which species are encountered (herring gull). At the site visit the CSMA explained that the phone / computer app had been developed (the assessment team were shown the relevant emails) but that at present the CSMA didn’t wish to develop this further.</p> <p>With the addition of 2018 logbook data, observer report and previous information about the fishery, the team considered whether this condition could be closed out at this surveillance audit. However, given that the observer data only had 13 trips in 2018 and didn’t include those vessels operating in the east (Plymouth etc) the team felt that an additional year of data was required.</p>
	Year 3	<p>Logbook revisions made in Year 2 have been continued in 2019 (year 3). Compliance overall is good but three vessels appear not record slippage and discards, reducing the adequacy of the information base. Corrective actions from the CSMA have been put in place to address this (see section 3.5.3 and Appendix 4.4). The SMRU report (the fishery independent observer programme) has been presented providing details of the observer programme and the interaction levels for the season. This meets the milestone requirement.</p> <p>Discard data from logbooks has been assessed with results highlighted within a summary spreadsheet.</p>
	Year 4	<p>SMRU observer program continued in 2020 (at a slightly reduced capacity due to Covid restrictions) and was also in place for 2021 (although no data was available for the audit. 2020-2021 also saw the installation of CCTV on all vessels (section 6.2.2.5) Overall compliance with logbooks remains good for the fleet, despite a couple of vessels not recording interactions.</p> <p>There has been no evidence of ETP mortality from these sources and therefore no trend analysis would be warranted. Further evidence of successful</p>

	<p>implementation from vessel actions can be found from the interaction with three dolphins with a CSMA member vessel, which was recorded on camera from the shore by members of the public and report in 2020 (Jones et al. 2020). The vessel skipper employed the backdown technique (using bow thrusters) to lower the headline of the net and release the dolphins, as per the CSMA guide. The interaction was reported to the MMO and correctly recorded in the vessel logbook</p> <p>Each year of the condition has seen development and implementation of management measures with respect to this condition and the assessment team considered that rescoring of the PI was possible based on the improvements in the fishery.</p>
Progress status	Closed at Reassessment
Carrying over condition <input type="checkbox"/>	No
Closing the condition during the reassessment	<p>The 2.3.2c SI from FR1.3 applied to this condition, does not exist in the same language in FCR2.01. The 'new iteration' of the SI is 2.3.2d and the language of the SG has changed.</p> <p>FR1.3 PI2.3.2c - <i>There is evidence that the strategy is being implemented successfully</i></p> <p>FCR2.01 PI2.3.2d - <i>'There is some evidence that the measures/strategy is being implemented successfully.'</i></p> <p>Under this new definition and with associated guidance SG80 can be considered met as described in the scoring rationale of this report. The condition is therefore not carried forward into the new certification period (should the fishery be certified).</p>

Appendix 5.3 New Conditions

Table 39. Condition 1

Performance Indicator	1.2.4
Score	75
Justification	<p>The WKWEST data compilation workshop of 2021 concluded that the landings (including that of the UoA) and the biomass data provided by the PELTIC survey for sardine in Subarea 7 are appropriate to assess the stock and provide advice. The extension of the PELTIC survey from 2017 provides good coverage of the stock distribution, and the area where the majority of the fishery happens (ICES 2021a). In addition, the short time-lag between the survey observations (October) and the assessment (November) further support the use of PELTIC biomass estimates as input data for stock assessment.</p> <p>The availability of the biomass data to assess the stock now allow the stock to be classified as category 3 and the benchmark panel agreed that a SPiCT model should be used to assess the status of the stock based on the relative biomass and fishing mortality to the reference points (B_{MSY}, F_{MSY}). However, ICES (2021a) acknowledged that the estimates of absolute biomass (B), fishing mortality (F) and the reference points (F_{MSY} and B_{MSY}) provided by the model were considered unreliable, and therefore, the catch advice would be based on the biomass trend estimated with the data provided by the acoustic survey PELTIC. The benchmark provides a biomass safeguard from the historical biomass index in the 'total area' of the stock and set it at 109,965 t. If the biomass index fell below this value, the benchmark recommended that the</p>

advised catch should be reduced in proportion to the drop. The major features of the target stock are its distribution which is accounted for in the PELTIC survey and its short life-span which is accounted for in the model type (SPiCT models have been designed and MSE tested on simulated sardine stocks (ICES 2020d)). The UoA supply logbook data and fishery dependent length-frequency data and discard into the assessment process, although the time-series of this is weak for the length frequency at present and prevents its use in the current assessment (CEFAS 2020a), this is covered by the survey data.

ICES advises the use of the 1-over-2 rule with 80% symmetric uncertainty caps for short-lived stocks in category 3 (ICES 2020b) ICES applied the 1 over 2 rule to this stock for the first time in December 2021 (WGHANSA) to provide catch advice for 2022 and as detailed in section 6.1.6.1. ICES set its advice basis at 6,906 t based on this 1 over 2 rule (Figure 17). This advice value is not considered appropriate for the stock with reference to the starting point of the HCR (ICES 2021a), subsequent HCR simulations (ICES 2021g) and scientific opinion (see Appendix 8). The starting point for the 1 over 2 rule is low because of a combination of market forces, the CSMA catch limit and lack of opportunistic harvesting of the stock in the past 2 years. ICES adopted and tested the 1 over 2 rule on the assumption that the exploitation rate at the point at which the HCR is applied is at or near MSY whilst for the sardine stock it was only moderately exploited in recent years and therefore higher fishing mortality ($>F$ in 2019 and 2020 but $<F_{MSY}$) would have resulted in higher advice without compromising the status of the stock. Clear evidence of this comes from the harvest rate in 2019 (the start point for the HCR) which was 1.95 %, which is well below the harvest rate in previous years (around 7% in 2017 and 2018) (Table 13) and which CEFAS consider well below the rate the stock can accommodate (CEFAS - Appendix 4 - HR with values of 9 -10% don't usually impact a stock. From a survey you estimate the catchability of the stock and for sprat (in subarea 7) at 10 % was considered precautionary [as an example]). Given this fishing pattern, if the 1o2 rule is applied to recent landings, the catch advice is unnecessary low (ICES 2021a) (ICES 2021g) and ICES showed the 1 over 2 rule could result in catches between 6,906 t and 13,777 t depending on the start point Table 14 (ICES 2021g). According to CEFAS the key issue with the ICES HCR on this stock is that catches do not track stock size. However, this HCR was adopted by ICES by default because no other HCR simulation had been MSE tested within the data limited workshops. Alternative approaches to implementing this rule for the first time in sardine in Subarea 7 were discarded as they deviated from the recommended practice (ICES 2020d; ICES 2021g) and ICES notes that the rule should be considered as a provisional HCR with the aim of achieving a better management approach within ten years (ICES 2021a).

Whilst the ICES HCR is not considered appropriate the CSMA and CEFAS HCR utilises the assessment information to define the catch limits and requires annual 'approval' confirmation with CEFAS that the advice is appropriate to the current stock status and the reference points. As such the assessment is capable of providing an appropriate HCR. The HCR allows for catch limits above the ICES advice (because of the issues in the ICES HCR, discussed above) but importantly requires annual 'approval' confirmation with CEFAS that the advice is appropriate and does not risk F being too high (above F_{MSY}).

Overall the team felt that although the CMSA HCR was the one with the associated HCT tool and is based on the stock advice may be considered

	appropriate for the stock, because the ICES advice basis is based on an inappropriate harvest rate calculation it cannot be said that the assessment is appropriate for the HCR (1 over 2 rule) ICES use and SG80 is not met for 1.2.4.a.
Condition	By Year 4 the fishery should ensure that the the stock assessment and subsequent advice from ICES is appropriate for the harvest control rule.
Condition deadline	Year 4 Surveillance
Exceptional Circumstances <input type="checkbox"/>	N/A
Milestones	Year 1: the CSMA should hold meetings with CEFAS and discuss a plan that is likely to lead to lead to the development of an appropriate HCR at the stock level from the ICES stock assessment. Evidence of these engagements and the plan should be shown to the CAB at the 1st surveillance audit. Score 75. Year 2-3: The CSMA should implement the plan developed in year 1, monitor its progress and redevelop/revise as required. At the Year 2 surveillance the client should provide the CAB with an update and status report. Score 75. Year 4: the CSMA should provide the CAB with evidence that the plan developed in year 1 has been successfully implemented and has resulted in a assessment which is appropriate for the HCR. Score 80
Verification with other entities	It is anticipated that the client will require agreement from CEFAS for this condition and evidence of support for the condition and its milestones will be required.
Complete the Following Rows for reassessments	
Carried over condition <input type="checkbox"/>	No
Related condition <input type="checkbox"/>	No
Condition rewritten <input type="checkbox"/>	No

Appendix 6 Client Action Plan

Table 40. Action plan.

1	Condition number
	Condition 1
2	Performance Indicator(s)
	1.2.4
3	Score
	75
4	Condition(s)
	By Year 4 the fishery should ensure that the stock assessment and subsequent advice from ICES is appropriate for the harvest control rule.
5	Milestone(s)
	<p>Year 1: the CSMA should hold meetings with Cefas and discuss a plan that is likely to lead to the development of an appropriate HCR at the stock level from the ICES stock assessment. Evidence of these engagements and the plan should be shown to the CAB at the 1st surveillance audit. Score 75.</p> <p>Year 2-3: The CSMA should implement the plan developed in year 1, monitor its progress and redevelop/revise as required. At the Year 2 surveillance the client should provide the CAB with an update and status report. Score 75.</p> <p>Year 4: the CSMA should provide the CAB with evidence that the plan developed in year 1 has been successfully implemented and has resulted in an assessment which is appropriate for the HCR. Score 80</p>
6	Summary of action plan
	<p>Year 1 – By 2023 an action plan is in place to present to ICES an alternative assessment and/or HCR for the stock</p> <p>Year 2 – By the end of 2024 a Management Strategy Evaluation (MSE) is developed to test the performance of different HCRs for a sustainable management of the stock.</p> <p>Year 3 – By the end of 2025 the MSE is evaluated by ICES and a new HCR is adopted to provide advice</p> <p>Year 4 – By 2026 CSMA implements a HCR for the fishery that is in line with the ICES advice</p>

Table 41. Action plan details. Grey cells are instructions

Milestone	Action	Roles & Responsibilities	Outputs
Year 1 - 2023	<ul style="list-style-type: none"> CSMA and Cefas discuss a strategy to present to ICES an alternative assessment model and HCR for the stock Cefas requests funding to develop a management strategy evaluation (MSE) to test the performance of a set of HCR to provide advice for the stock 	CSMA and Cefas will work together designing an action plan to develop an alternative assessment and HCR for ICES to provide catch advice	<ul style="list-style-type: none"> Attendee list and minutes of the meetings between CSMA and Cefas
Year 2 - 2024	<ul style="list-style-type: none"> Cefas develops the MSE Cefas presents the outputs of the MSE to WGHANSA and a ICES workshop to evaluate the MSE is requested CSMA discusses progress with Cefas and provides support when needed 	Cefas will be in charge of developing the MSE and presenting the results within ICES. The UK will request a ICES workshop to review the work done. CSMA will support Cefas when needed.	<ul style="list-style-type: none"> MSE report Attendee list and minutes of the meetings between CSMA and Cefas
Year 3 - 2025	<ul style="list-style-type: none"> The MSE is reviewed within ICES The new HCR is used to provide ICES advice CSMA discusses progress with Cefas and provides support when needed 	Cefas will be involved in the potential workshop and adoption of a new HCR for the stock CSMA will support Cefas when needed.	<ul style="list-style-type: none"> Workshop report WGHANSA report Attendee list and minutes of the meeting between CSMA and Cefas
Year 4 - 2026	<ul style="list-style-type: none"> CSMA, in collaboration with Cefas, designs a new HCR for the Cornish fishery that is in line with the ICES advice CSMA implements the new HCR to manage the fishery 	CSMA will be in charge of designing an HCR for the fishery. Cefas will review the proposal and provide advice	<ul style="list-style-type: none"> Implementation of an HCR for the fishery that is in line with the ICES advice

6.1 Action Plan support

Table 42. Evidence of support for action plan

Condition number	Entity	Evidence of support	Supporting document
Condition 1	Cefas	Rosana Ourens- Member of the working group WGHANSA, where sardine in Subarea 7 is assessed Richard Nash - Member of the working group WGHANSA, where sardine in Subarea 7 is assessed Jeroen Van Der Kooij – Member of the working group WGACEGG, where the methodology of acoustic surveys (including the PELTIC survey) is coordinated	The team leader was emailed by Rosana Ourens with the action plan on 27/05/2022

7.19.8a i-iii : Verified by :	Initials: HJ Date: 27/05/2022
7.19.8b Based on the above Control Union UK (CUUK) is satisfied that the closure of conditions is both achievable by the client and realistic in the period specified.	

Appendix 7 Surveillance

Table 43. Fishery surveillance programme

Surveillance level	Year 1	Year 2	Year 3	Year 4
3	On-site surveillance audit	On-site surveillance audit	On-site surveillance audit	On-site surveillance audit & re-certification site visit

Table 44. Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
1	August 2023	August 2023	None required

Table 45. Surveillance level justification

Year	Surveillance activity	Number of auditors	Rationale
1	On-site audit	1 auditor on-site with remote support from 1 auditor	From the condition requirements it can be deduced that information needed to verify progress towards condition 1.2.4 can be provided remotely in year 1. The CAB proposes to have an on-site audit with 1 auditor on-site with remote support – this is to ensure that all information is collected and because the information can be provided remotely.

Appendix 8 Harmonised fishery assessments

Principle 1

None, there are no other MSC fisheries which target this stock.

Principle 2

Based on FCR2.01 there is a need for harmonisation on P2 at least in part on a number of outcome PIs as per table GPB1. As per <https://mscportal.force.com/interpret/s/article/Assessing-P2-species-cumulatively-between-v2-0-and-1-3-fisheries-GSA3-1-9-1527262006140> only V2.01 fisheries need harmonisation on Principle 2 only if both fisheries are FCR2.01. Table 46 shows the overlap with the fisheries relevant to this fishery the scoring elements concerned for harmonisation are harbour porpoise and common dolphin.

Table GPB1: Harmonisation requirements per PI. No harmonisation is required for P2 PIs and scoring issues (SIs) that are not listed in the table.

PI/SIs		Required to harmonise
All P1 PIs	Yes	P1 always considers the impacts of all fisheries on a stock. Any fisheries that have the same P1 species (stocks) should be harmonised.
PI 2.1.1a	Partially	For stocks that are 'main' in both UoAs, harmonise status relative to PRI (at SG60,80 and 100), and if below PRI, harmonise cumulative impacts at SG80 (not at SG60).
PI 2.2.1a	Partially	For stocks that are 'main' in both UoAs, harmonise status relative to Biologically Based Limits (at SG60, 80, and 100), and if below Biologically Based Limits, harmonise cumulative impacts at SG80 (not at SG60).
PI 2.3.1a	Partially	Harmonise recognition of any limits applicable to both UoAs (at SG60, 80 and 100), and cumulative effects of the UoAs at SG80 and SG100 (not at SG60).
PI 2.4.1b	Partially	Harmonise recognition of VMEs where both UoAs operate in the same 'managed area(s)' (see Guidance to the MSC Fisheries Standard).
PI 2.4.2 a, c	Partially	Harmonise scoring at SG100 since all fishery impacts are considered (not at SG60 or 80).
All P2 PIs	Situation dependent	If 2 UoAs are identical in scope, even if the UoCs are different (e.g. separate clients), harmonisation is required.

Table 46. Overlapping fisheries

Fishery name	Gear	Location	Certification status	Performance Indicators to harmonise	Score
Cornish hake gill net	Gill nets And Entangling Nets	ICES subarea 7	Certified (V2.01).	PI2.3.1a	80
FROM Nord North Sea and Eastern Channel pelagic trawl herring	pelagic trawl	ICES subarea 7 and 4	Certified (V2.01).	PI2.3.1a	80
Joint Demersal Fisheries in the North Sea	Multiple	ICES subarea 4	Certified (V2.01).	PI2.3.1a	80

Fishery name	Gear	Location	Certification status	Performance Indicators to harmonise	Score
Northern Ireland Pelagic Sustainability Group (NIPSG) Irish Sea herring	pelagic trawl	ICES subarea 7 and 6	Certified (V2.01).	PI2.3.1a	80
Schleswig-Holstein blue shell mussel	Mussel culture	ICES subarea 4	Certified (V2.01).	PI2.3.1a	80
SFSAG northern demersal fishery	trawl	ICES subarea 4 and 6a	Certified (V2.01).	PI2.3.1a	80

Table 47. Overlapping fisheries

Supporting information	
<p>Principle 1 None, there are no other MSC fisheries which target this stock.</p> <p>Principle 2 Table 46 shows the overlap with the fisheries relevant to this fishery the scoring elements concerned for harmonisation are harbour porpoise and common dolphin. There is overlap with Cornish hake on some VMEs but there are no known protection measures requiring harmonisation</p>	
Was either FCP v2.2 Annex PB1.3.3.4 or PB1.3.4.5 applied when harmonising?	No
Date of harmonisation meeting	N/A
If applicable, describe the meeting outcome	
Harmonisation completed by assessment of published reports of relevant fisheries in Table 46	

Appendix 10 Objection Procedure

No objections were received during the objection period

Appendix 11 CSMA documents

CSMA slippage policy 2020

CSMA Slippage Policy

The CSMA's policy is to return non target species with the best survivability possible. Members will endeavour to release any shoals of non target species as early as possible within the net hauling process to achieve higher survivability chances. Based on the legislation of the Common Fisheries Policy (see below) and of other similar fishing operations elsewhere in Europe Herring should be released at the latest when 80% of the net is aboard and Mackerel at or before 90%. Visible markers will be attached to all nets at 80 and 90% to denote net closure. Due to our target species, the sardine, being a non pressure stock we are not bound by the landing obligation but members will minimise unnecessary damage to all stocks where possible.

In order to ascertain survival rates for slipped species sampling will be carried out by members when appropriate to estimate species composition, fish size and quantity. Slippage composition and quantity will be recorded on vessel logbooks.

As specified in the CFP Basic Regulation (1380/2013) and the Delegated Acts for the North Sea (C(2014)7558) and North Western Waters (C(2014)7549) certain exemptions and provisions have been created.

High Survivability: Exemption from the Landing Obligation has been permitted for species which scientific evidence demonstrates high survival rates.

The Delegated Acts permit catches of mackerel and herring in the purse seine fisheries to be exempt from the landing obligation **only** when the following conditions are met:

- The catch is released before 80% closure of the purse seine in fisheries for mackerel and 90% closure of the purse seine in fisheries for herring. If the school consists of a mixture of both species before 80% closure of the purse seine. After these points, release of the catch is prohibited;
- In Areas VIa and VIb, the purse seine gear is fitted with visible buoys clearly marking the limits set out above;
- The surrounded school of fish is sampled before its release to estimate species composition, the fish size composition and the quantity;
- The vessel and purse seine gear is equipped with electronic recording and documenting system.

www.gov.scot/Resource/0046/00467409.docx The Landing Obligation – Guidance for the *Scottish* Pelagic Industry

Cetacean by catch

<https://www.bmis-bycatch.org/mitigation-techniques/backdown-procedure-and-medina-panel>

CSMA agreed HCR and fishery specific objectives

From: Chris Blamey <chrisblamey@hotmail.com>

Sent: 28 February 2022 09:34

To: Richard Caslake <Gus.Caslake@seafish.co.uk>

Subject: Proposed Harvest control rule changes

Hi Gus,

As secretary of the Cornish Sardine Management Association I can confirm, having collated the feedback from CSMA members, that all members are have agreed to adopt the HCR and species specific objectives as defined in the attached documents.

The HCR and species specific objectives will be included within a revised CSMA code of conduct.

Regards

Chris

CSMA secretary