

## **Bass Investigations in Cornwall**

### **Annual report for 2024**

This report is based on information collected in a voluntary capacity by the Cornwall Bass Investigations Group (CBIG) of citizen scientists, to improve the understanding of the status of juvenile bass within the Fal and Helford Special Area of Conservation (SAC). Since 2021, this report has been produced by Robin Bradley, who took over from Derek Goodwin MBE who started this work in 1994, and ran the surveys until then.

It is intended that all the information in this, and previous reports, is freely available to others, including research workers and students, and issued to various individuals, groups and authorities. These include the Helford Marine Conservation Group, Duchy of Cornwall, Cornwall Inshore Fisheries and Conservation Authority, CEFAS, DEFRA, Universities, Environment Agency, Inland Fisheries Ireland, Natural England, Cornwall Wildlife Trust, Environmental Records Centre for Cornwall & Isles of Scilly, Bass Anglers' Sportfishing Society, Institute of Fisheries Management.

We also hope that our efforts may inspire and help others to carry out such surveys in other areas, in order to gain a more complete picture of bass year class success around the UK.

*These reports continue to be dedicated to the memory of the late Donovan Kelley MBE, whose bass research over many years laid the foundations for these investigations, and the conservation of bass.*

*Also to the memory of the late John Pendarves Bridger, a key founder worker for these bass studies, and a colleague of Donovan Kelley.*



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## SUMMARY

The group continues to go from strength to strength, and now includes 63 volunteers. Between May and September, we completed 23 surveys on the Fal, 14 on the Helford, 3 on the Gannel and 1 on the Camel. In total, we netted an estimated 37, 859 animals from 33 species, of which 2,812 were measured.

Total bass catches in the Fal were 4,302 '0' groups, 893 '1' groups and 145 '2' groups. For the Helford, the corresponding figures were 1,029, 401 and 1. Combined figures for the Camel and Gannel were 12 '0' groups and 1 '1' group.

### **Catches of '1' group bass in the Fal and Helford estuaries, particularly in May and June, confirms our provisional assessment of 'Good' for the 2023 year class in the Fal and Helford SAC.**

The first '0' group we encountered was a single fish at St Clement on the Fal on 29.5.24. This was the earliest and smallest (25mm) we've ever seen in all previous surveys.

The total number of '0' groups netted, and the size of some of the catches on the Fal, allow us to make a provisional assessment of 'Good' for the 2024 year class on the Fal. The Catch Per Survey (CPS) value appears to support this conclusion. Were it not for some unexpected poor catches, the values might have been even higher. Some catches were similar to 2014, one of the best year classes we've seen in recent times. However, in the absence of a defined numerical measure of year class quality, these findings must be seen in the context of generally lower recruitment since 2008.<sup>1</sup>

The size of some of the catches on the Helford, and the CPS value, allows us to make a provisional assessment of 'Good' for the 2024 year class on the Helford. This is less convincing than for the Fal, but values were probably affected by the initially good catches tailing off during September.

### **Taking the '0' group results for both estuaries into account allows us to make a provisional assessment of 'Good' for the 2024 year class in the Fal and Helford SAC.**

Bass growth looks similar (Helford) or slightly lower (Fal) for '0' groups compared to recent years, while for '1' groups growth looks slightly lower than recent years in both the Fal and Helford. These growth patterns may be linked to the cooler summer weather we had.

Our work is being increasingly recognised in academic and government circles. This year we again helped a student from Plymouth University to collect juvenile bass for her PhD research (and for bass research at Essex University). We have again assisted Plymouth University in deploying underwater cameras as part of the 'FinVision' project. Dr Kieran Hyder from Cefas requested survey data from us in connection with the ICES bass stock assessment.

Developments this year include the introduction of Fyke netting, recording of each replicate (run) separately, recording of all survey results and metadata on a spreadsheet, and working with the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS) to digitise the data from previous annual reports.

We instigated, and began working with colleagues under the 'FinVision' project, the collation of reports from juvenile/small fish surveys from around the UK to compare data on '0' and '1' group bass abundance.

## 1. INTRODUCTION

The group continues to go from strength to strength, and now includes 63 volunteers from many different walks of life, with a wide range of useful skills which help the group to function well. Very sadly, we lost Craig Baldwin this year, following his tragic death in January.

There is a good social element to the group, and members find the work both enjoyable and fulfilling – ‘good fun with a purpose’ as one said.



CBIG volunteers and helpers at Bonallack, on the Helford. L-R Gav Ingram, Brad Wiffen, Kevin Pinch with ‘Oak’ and George Brew. Photo: Robin Bradley.

We have been able to complete a very comprehensive survey programme this year, thanks to the efforts of our volunteers, including two more members who have used their own boats, giving us additional capacity to survey those sites which cannot be accessed on foot.

It was very pleasing to see that Cowlands Creek more than justified our decision (prompted by group member Ian Ingram) to look again at this site; it produces very good numbers of juvenile bass at times, and catches can include a mix of year groups from 0 - 2.

Between May and September, we completed 23 surveys on the Fal (including the Penryn and Tresillian rivers), 14 on the Helford, 3 on the Gannel and 1 on the Camel. In total, we netted an estimated 37, 859 animals from 33 species, of which 2,812 were measured. I believe we are unique in carrying out such a comprehensive programme of dedicated juvenile bass

surveys spanning the late Spring, Summer and early Autumn, focussed on assessing spawning and settlement success, but also including first-winter survival and growth.



Boarding Jon Williams' boat after a survey at Merthen on the Helford. Rachel Turnbull and the author also pictured. Photo: Hedley Thomas

Our aim is to survey sites known to consistently produce juvenile bass (which we have designated as  $\alpha$  sites) evenly to account for the varying productivity of these. We will continue to trial new sites where the need arises and time allows. Ideally  $\alpha$  sites are surveyed twice in each programme period i.e. May and June or August and September, with the emphasis on August and September, where we are trying to determine spawning and settlement success for that year, with surveys in May and June the following year providing confirmation via '1' group numbers. Surveys are suspended in July to allow the incoming '0' groups to grow sufficiently to better withstand the rigours of netting.

A key development this year has been the recording of all survey results and metadata on a spreadsheet. This is to facilitate easier analysis for those who may find the data useful for research and other purposes. It has also proved useful in our own analysis. The spreadsheet is freely available via the Cornwall Bass Investigations Group (CBIG) website (Survey Data page). Because of the inclusion of all survey data in the spreadsheet, individual survey sheets are not included here in the interests of brevity. Likewise, details of sites which have been previously described are not included; the reader is referred to previous reports on the CBIG

website (Annual Reports section). Details of netting methods and net specifications are given in Appendix 9.5.

It is encouraging to see that our work is being increasingly recognised in academic and government circles. This year, Rachel Turnbull from Plymouth University has again accompanied us on a number of surveys to obtain '0' and '1' group bass. Not only will these help with her PhD research work, tissues from these fish will also be used in bass research at Essex University. This work will lead to a greater understanding of juvenile bass habitat requirements, to identifying the contribution different estuaries make to the adult stock, and to identifying actual spawning dates.

We have again assisted Plymouth University with the deployment of underwater Juvenile Habitat Monitoring Cameras (JHaM-Cams) on surveys as part of the Defra-funded 'FinVision' Fisheries Industry Science Partnership project, which aims to shed more light on how juvenile fish use estuaries. I attended several very informative training events provided jointly by the University and the Institute of Fisheries Management as part of this project, including a workshop on the Erme Estuary in South Devon. One of the skills I acquired was in the use of Fyke nets, which have now been incorporated in the survey programme (see later).

“Assessing the coherence in biological and environmental drivers of young sea bass abundance across important estuarine nursery areas of the northern European sea bass stock” was published in January in *Frontiers in Marine Science*. This followed “Pelagic connectivity of European sea bass between spawning and nursery grounds” which was published in the same journal in January 2023. Both papers were led by Cefas, and included data from our surveys, and listed Derek Goodwin and Robin Bradley among the authors. It is of great encouragement to the group to know that their efforts are contributing towards such important research.

In addition to helping with research and education, it has always been our hope that our data would be used in the management of the bass fishery. We came a step closer to this when Dr Kieran Hyder from Cefas requested survey data from us in connection with the ICES bass stock assessment. With the help of Dr Ben Ciotti from Plymouth University, we have supplied data from 2005 onwards. There is no guarantee that this will be used in the assessment model, but at least it will be in the mix, and available to the assessors.

We have been working with Josh Baum from the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS) to digitise the data (including bass abundance and lengths, and other species found) in previous pdf Annual Reports. The digitised data will be available in spreadsheet form on our website (Survey Data page).

It is useful to compare results from surveys in other areas, as this may give increased confidence in any conclusions drawn, or draw attention to regional variation where divergence in results occurs. At present, such comparisons are on an ad hoc basis, but we instigated, and have begun working with colleagues under the 'FinVision' project, the collation of reports from juvenile/small fish surveys from around the UK to compare data on '0' and '1' group bass abundance. A subsidiary aim is to encourage the extension of juvenile bass surveys to other areas, in order to gain a better picture of spawning and settlement success around the UK.

We submitted a response to Devon & Severn IFCA's formal consultation on proposed changes to netting permit conditions, expressing our concern regarding the proposal to open a six-month fixed net fishery within Salcombe Estuary. We were pleased to note that this proposal was rejected.



## 2. SITES, METHODS & RECORDING

### 2.1 Sites

Figure 1 shows the sites surveyed in 2024. The dates of these surveys (and summary results from them) are shown in the Results section. The Fal sites are annotated with green boxes, the Helford sites with blue.

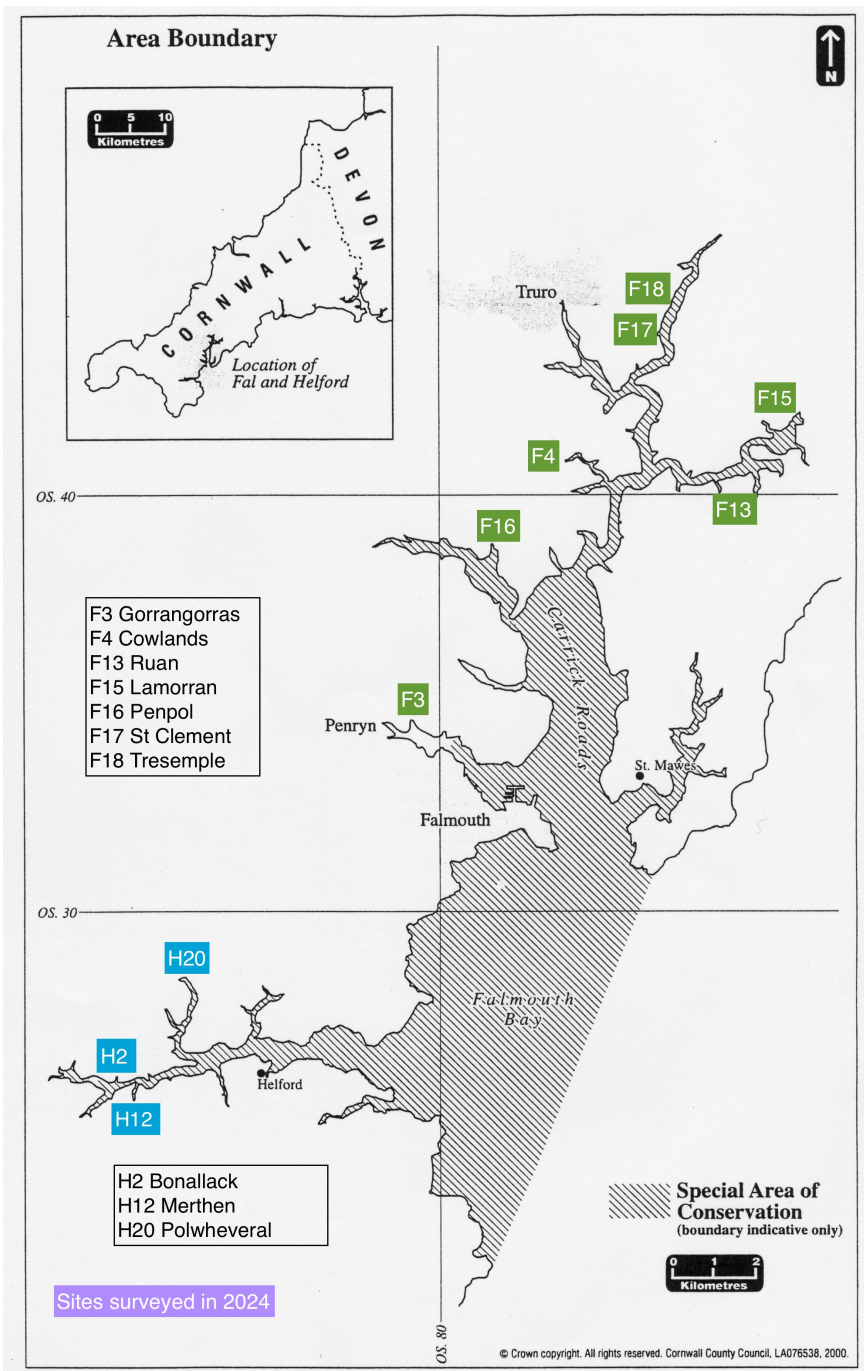


Fig. 1 Sites surveyed in 2024

All of these sites (plus the Camel and Gannel sites) have been described in previous reports (2023 or 2022), with the exception of a new site, Tresemple (see below), which we began

surveying this year. Note that St Clement was incorrectly numbered as F5 in last year's report.

We were only able to survey the Camel once, at the Trewornan Dam site, bad weather preventing us from completing a planned survey at the Rail Bridge Pool near Padstow. We were able to survey the Gannel site three times. We are still to make any appreciable catches at any of these sites, and they are not the easiest to survey. In light of this, and our intention to include Fyke netting on the Fal and extend to the Helford next year, we have decided to stop surveying the Camel and Gannel, so that we can concentrate our efforts on the Fal and Helford without overburdening our volunteers.

## 2.2 Methods

Further details of methods employed and equipment used are included in Appendix 9.5 and the CBIG Survey Data spreadsheet (see under Notes tab).

A major change this year was the recording of each replicate (run) separately. Previously we had noted the time of each replicate, but metadata and catches were measured and recorded just once, at the beginning or end of proceedings respectively. This mainly applies to 'held' surveys, where the net is held for a specified period, sometimes several times, before being brought to the shore in a 'J' pattern, rather than 'haul' surveys, where the net is usually only hauled once. A description of netting methods can be found in Appendix 9.5.



A 'held' survey at Gorrangorras on the Fal (Penryn River). Photo: Robin Bradley.



A 'haul' survey at Polwheveral on the Helford. Photo: Robin Bradley.

This change has proved useful in allowing us to see which species are present at various stages of the tide, and any changes in salinity, or water temperature which accompany these. It also means that fish are kept for shorter periods, thereby increasing survival, particularly on hot days. Having to measure and record the fish, in addition to the water temperature, salinity and depth as quickly as possible, so that the next run can be started before the fish move through, is not without its challenges!

This year we trialled the use of a Fyke net. This requires a totally different approach compared to seine netting. The net is set while the tide is flooding, left over High Water, then retrieved during the ebb, as soon as the net can be accessed. In practice this means setting the net in the morning, any time up to about 2 hours after Low Water, then returning about 6 hours later. It is possible to carry out a survey single-handed with this method.

A different type of site is also required for Fyke netting, with the net being placed in a narrow channel facing up-tide. Tresemple, an accessible site on the Tresillian River (part of the Fal complex), has a large area of mudflat draining into a small gully, which wends its way to the main channel. The first trial was undertaken on 16<sup>th</sup> August, with a mid-afternoon High Tide of 4.3m (Falmouth). The net was set so that as fish left the site on the ebb they would hopefully swim into it on the bottom.

The results of this first trial were spectacular, with 597 '0' groups and very little else being caught. However, a second survey at this site just two weeks later, in very similar conditions, produced just 5 '0' groups, leading us to wonder if the fish may have moved up (or down) the

estuary. Fyke netting will now become a standard feature of our surveys, and we will be looking for a suitable site on the Helford for next year.



Fyke net set before the tide flooded the site at Tresemple. Photo: Robin Bradley.

### 2.3 Recording

This year we have continued with our practice of measuring approximately 50 bass, then counting the remaining fish which are returned unmeasured. For other species, we have measured a sufficient quantity of fish to give us the size range, and then recorded a numerical estimate of each species. It was felt that this would be more useful than a semi-quantitative estimate (e.g. ++ or occasional).

We have changed to measuring length in mm rather than cm, to standardise with other surveys and scientific practices.

It's usually clear from the length whether a fish is an 0, 1 or even 2 group. However, this can be less clear-cut at times, e.g. when the length isn't quite what you expect for the time of year. In cases where we're not sure, we usually take a few scales and check the age. The presence of spots, which are usually only found on '0' groups, is also useful (see photo on p19). We may also refer to the modal lengths at age table in the Solent report (i), bearing in mind that these are for fish caught in September

Survey data is recorded in a 'Rite in the rain' notebook with each measured fish being recorded against 1mm (previously 0.1cm) size increments. Following advice from Dr Ben Ciotti and Rob Hillman, the pages showing data from each survey are scanned, giving a

permanent electronic record, before being erased for the next survey. On occasion (e.g. while Fyke netting single-handed) we have recorded lengths and numbers on a phone Voice Memo App.

As mentioned earlier, a major change this year has transferring the data to a single Excel spreadsheet, rather than completing individual survey reports using Word.

### 3. WEATHER

There were no prolonged cold periods over the 2023-24 winter. Water temperatures only dipped below 8°C for 6 days from 8.1.24 – 13.1.24, the lowest being 6.4°C on 10.1.24 (CIFCA temp logger at E Bank N in the Fal). Water temperatures of 6-7°C<sup>ii</sup>, for prolonged periods (>4 weeks?), are thought to kill first-winter bass if they have not reached a fork-length of 60mm by the onset of the cold spell<sup>iii</sup>. Overwinter '0' group losses from the 2023 class are therefore likely to have been minimal.

The warmest and wettest February on record was followed by the warmest spring on record.

Table 1 below shows water temperatures that were measured at some of our sites during the Winter and Spring. It's interesting to note the higher temperatures obtained for our sites compared to Falmouth and the Fal from mid-March due to the warming of the shallower intertidal, upper creek environments compared to the coast and deeper locations of the Carrick Roads estuary.

Date	Site	Water temperature (°C)				
		Measured on site*	Falmouth SST**	E Bank N (Upper Carrick Roads)***	Mylor Pool (Upper Carrick Roads)***	King Harry (Fal)****
13.1.24	Merthen	8.1	10.6	7.9	9.2	9
26.1.24	Cowlands	10.0	10.2	9.4	10.1	10.0
30.1.24	Gorranorra	12.3	10.3	9.4	10.1	10.1
21.2.24#	Polwheveral	11.5	10.8	9.9	10.6	11.0
26.2.24	Gorranorra	12.0	10.6	NA	NA	10.0
7.3.24	Cowlands	11.0	9.9	NA	NA	10.0
8.3.24	Polwheveral	9.8	9.9	NA	NA	10.0
14.3.24	Gorranorra	13.9	10.0	NA	NA	11.0
23.3.24	Polwheveral	13.4	10.7	NA	NA	10.9
9.4.24	Cowlands	14.0	10.9	NA	NA	11.5
18.4.24	Cowlands	16-17	10.8	NA	NA	12.2

Table 1 Winter and Spring water temperatures at sites in 2024

# River in valley leading to creek in spate

\* Battery operated digital thermometer \*\* [seatemperature.org](http://seatemperature.org) \*\*\*CIFCA temperature logger

\*\*\*\* F-POD (Joe Dennet)

NB temperatures were measured at varying times of the day for the site measurements, at unknown times for the Falmouth SST, at 0600 for the CIFCA temperature loggers, and at 2350 for the King Harry F-POD.

The average monthly Sea Surface Temperature (SST) for Falmouth ([seatemperature.org](http://seatemperature.org)) was above the long-term average for Jan (+0.6°C), Feb (+0.7°C), March (+0.9°C), April (+0.5°C), May (+1.3°C), June (+0.6°C) and August (+0.4°C), but below the long-term average for July (-0.3°C) and September (-0.4°C). The average water temperature during our surveys was 19.7°C in the Fal and 19.0°C in the Helford.

The Summer was slightly cooler (0.2°C) than average, and was the coolest since 2015. September was wetter than average.

Survey cancellations due to bad weather were more frequent than usual, with 3 in May, 2 in August, and 2 in September. 14 Surveys were carried out in ‘Good’ conditions, 22 in ‘Fair’ conditions, and 5 in ‘Poor’ conditions. We generally try to avoid surveys in poor conditions, but the weather may change on the day. However, surveys carried out in ‘poor’ conditions can give good results (see tables 2 & 3).

Good spawning and settlement years are attributed to an expansive and stable 9 °C isotherm, and poor years to a constrained and fluctuating one. An expansive and stable isotherm improves settlement success by facilitating spawning close to shore, supporting larval growth, and extending the spawning season. <sup>iv v vi</sup>

Figure 2 below is a screenshot taken on 22.2.24 from the Cornwall Beaches website ([cornwall-beaches.co.uk/sea-temperature](http://cornwall-beaches.co.uk/sea-temperature)). This shows that the sea temperature was already at or above 9 °C at that time right along the South Coast. This remained so during March, April and May, suggesting that the 2024 spawning and settlement would be a good one.

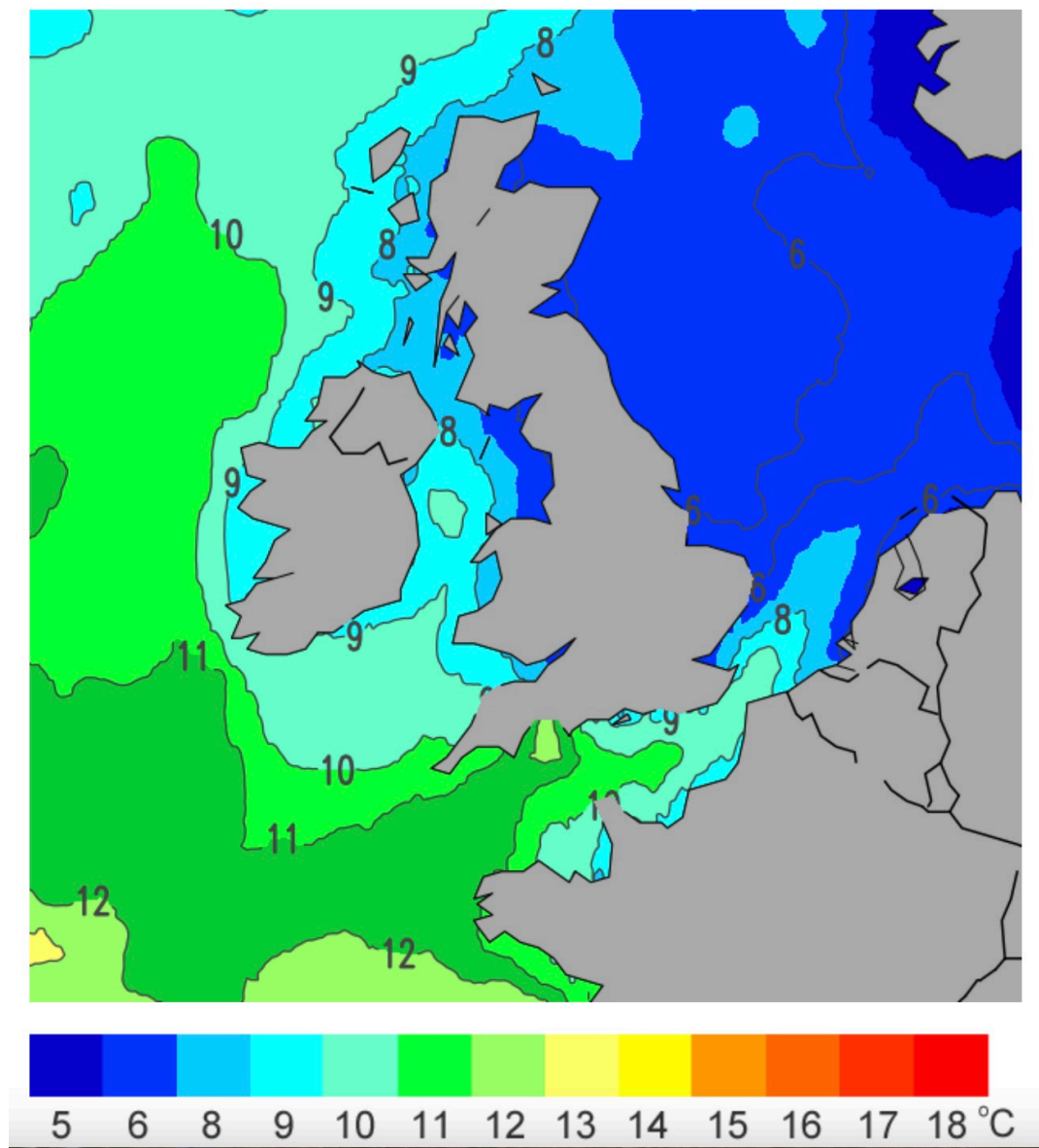


Fig. 2 Current sea temperature for the coastal waters of the British Isles on 22.2.24

Interannual variations in wind stress and temperature can induce large variability in larval dispersal because of their influence on oceanic currents and larval stage duration <sup>vii</sup> The main residual currents and offshore spawning areas for the English Channel are shown in Figure 3 below, taken from the paper the above statement comes from. It would seem that wind from the SW to the SE around the time when larvae are in the pelagic phase might encourage favourable settlement in the Fal and Helford by augmenting these currents.

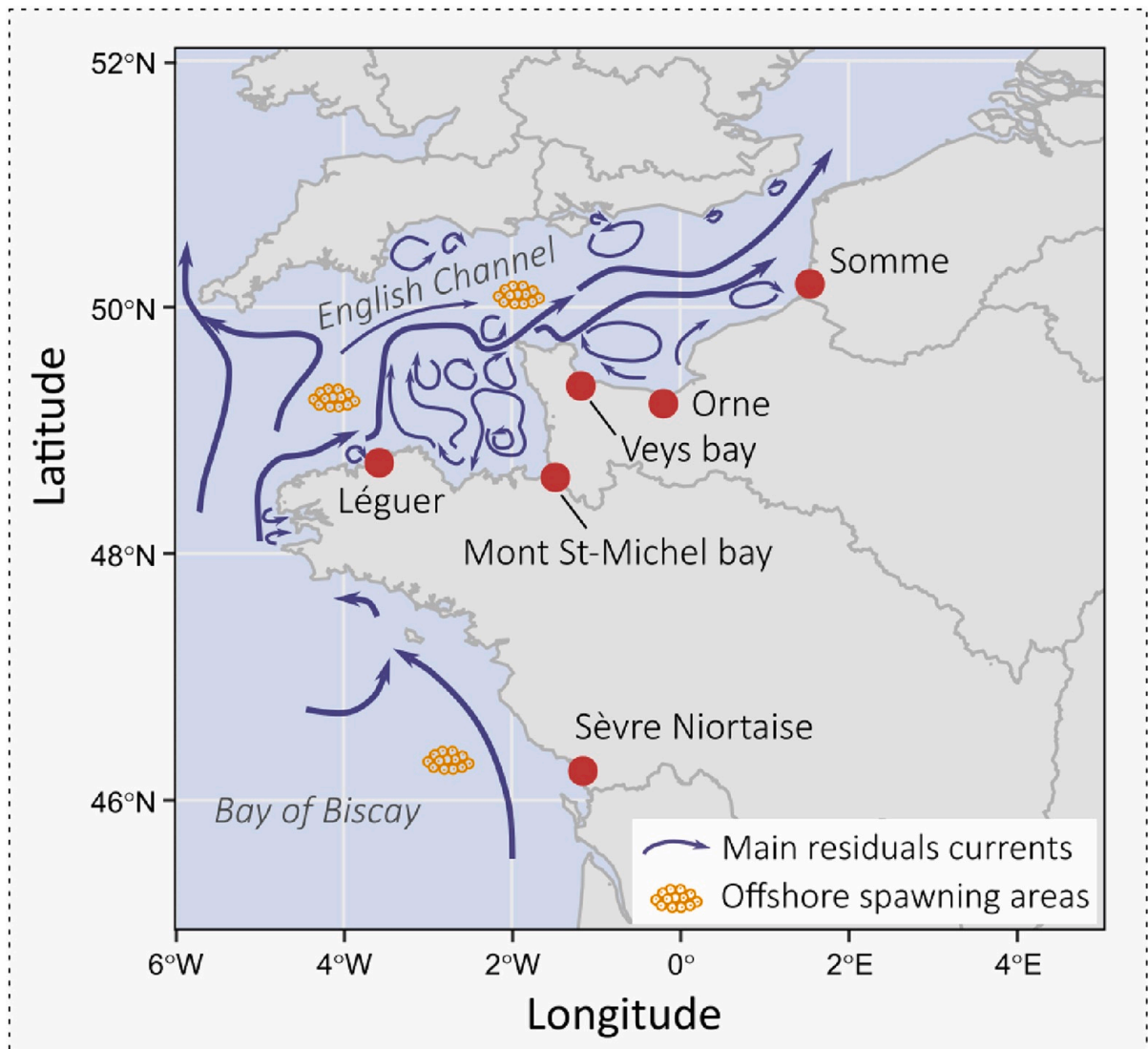


Fig. 3 The main residual currents and offshore bass spawning areas for the English Channel

During February, there were 16 days when the wind direction was between SW - SE, with an average speed of 14mph. During March the corresponding figures were 19 days and 13.5mph; during April, 14 days and 16.7mph; during May, 12 days and 11.8 mph. (Source: Timeanddate.com.)



## **4. RESULTS**

All measured lengths, counts of each species found, and metadata (site information, netting times, water temperature, salinity, weather conditions etc.) are recorded in the CBIG survey data spreadsheet, available via the Survey Data page of the CBIG website.

### **4.1 Bass abundance and lengths**

Summaries of bass catches and average lengths are included in tables on the following pages:

Page 21: Table 2 Bass catch summary 2024 - Fal

Page 22: Table 3 Bass catch summary – Helford

Page 23: Table 4 Bass catch summary – Camel and Gannel

Page 23: Table 5 Average lengths for ‘0’ and ‘1’ group bass – Fal and Helford

This year we have revised the bass catch summary table to include the method and net used, and the net soak time i.e. the total time the net was in the water and held against the tide during surveys where this applies.

### **Early-season survey results**

During the first part (May & June) of the survey programme, the group conducted 10 surveys on the Fal, 7 on the Helford, and 1 on the Gannel.

The Fal surveys during this period produced 450 ‘1’ group bass, giving a Catch Per Survey (CPS) of 45.0. Good numbers (266) were found at Lamorran on 23.5.24, and Cowlands (64) on 7.6.24. The Helford surveys produced 391 ‘1’ groups giving a CPS of 55.9. Good numbers (127, 114 and 87) were found at Polwheveral on 7.5.24, 26.5.24, and 5.6.24 respectively. No ‘1’ groups were found on the Gannel.

‘1’ groups were found on 8 of the 10 Fal surveys, with a range of 1 – 266, and at 7 of the 7 Helford surveys, with a range of 2 – 127.

The first ‘0’ group we encountered was a single fish at St Clement on the Fal on 29.5.24. This was the earliest and smallest (25mm) we’ve ever seen them. We recorded 3 more (27mm) at Cowlands on 7.6.24, and 1 at Bonallack (29mm) on 10.6.24. There appeared to be good numbers at Cowlands, but these probably evaded our net (5mm mesh). It would be interesting to deploy a very fine mesh intertidal net (as described by Steve Colclough) for short periods in such situations. It would also have been interesting to see what the JHam-Cam (FinVision project) would have detected, had it been in situ on that occasion.



‘0’ group post-larval bass (25mm). St Clement 29.5.24. Photo: Ryan Hepburn.

### **Late-season survey results**

During the second part (August & September) of the survey programme, the group conducted 13 surveys on the Fal, 7 on the Helford, 1 on the Camel and 2 on the Gannel. We were able to survey all our main sites on the Fal and Helford, including Lamorran, Ruan and Merthen which require a boat to access. ‘0’ groups were found on 11 of the 13 surveys on the Fal, 7 of the 7 surveys on the Helford, the single survey on the Camel, and 1 of the 2 surveys on the Gannel.

The Fal surveys during this period (including Fyke netting) produced a total of 4,245 ‘0’ groups giving a CPS of 326. Notable catches were made at Cowlands (378 & 717), Gorrangorras (297), Tresemple (597), Penpol (99), Ruan (564), and Lamorran (1,564). Unusually, there were no ‘0’ groups seen at Lamorran in August (18<sup>th</sup>), suggesting that the fish had not progressed that far up the estuary at that time, but were present in good numbers by mid-September. The Helford surveys during this time produced a total of 1,028 ‘0’ groups, giving a CPS of 147. Notable catches were made at Polwheveral (563), Bonallack (124), and Merthen (150) in August, but catches in September seemed lower than we were anticipating. 10 ‘0’ groups were found on the Camel, and 2 on the Gannel during this time.



From a catch of 563 '0' group bass (note spots), 200 grey mullet sp. And 100 gilthead bream at Polwheveral on 5.8.24. Photo: Hedley Thomas.

There was a run of unexpected poor results on both the Fal and the Helford at the end of August and beginning of September. These were at Tresempel (5 '0' groups) on 30.8.24, just 2 weeks after a first very good catch (597) there in very similar conditions, at Polwheveral (7) on 3.9.24, and at Penpol (10) on 4.9.24. A nil catch at Gorrangorras on 17.9.24 seemed very anomalous.

During August and September, good numbers (283) of '1' groups were found at Cowlands on 6.8.24, and at Lamorran (120) on 18.8.24 on the Fal. '1' group numbers tailed off in September, apart from one catch of 30 at Ruan on 6.9.24. Only 10 '1' groups were found on the Helford in August and September.

For the whole survey period, a total of 145 '2' groups were found on the Fal, including a single catch of 140 at Cowlands on 6.8.24 averaging 221mm. 1 '2' group was found on the Helford, at Bonallack, on 11.8.24 measuring 255mm.

The average length of all '0' groups measured was 79mm on the Fal and 86mm on the Helford. The average length of all '1' groups measured was 129mm on the Fal and 125mm on the Helford.



'0', '1' and '2' groups at Bonallack on 11.8.24. Photo: Harry Polkinghorne.

**Table 2 Bass catch summary – FAL 2024**

Date	Site	Bass						Method & net	Water				Weather			General conditions
		2024 class		2023 class		2022 class			See spreadsheet notes	Temp (°C)	Sal (‰)	Area (m <sup>2</sup> )	Total Soak time (h:m)	Air (°C)	Wind direction & Beaufort	
No.	Ave. TL (mm)	No.	Ave. TL (mm)	No.	Ave. TL (mm)											
6.5.24	Penpol	0		0		0		Haul - 29m	16.9	25	600	N/A	25	NNW 4	4/8 nil	Good
10.5.24	Gorran gorras	0		47	104	0		Held – 18m	23.4	25	N/A	00:10	18	E 3	2/8 nil	Good
11.5.24	Cowlands	0		32	123	3	197	Haul - 29m	20.5	15	540	N/A	26	ENE 3	1/8 nil	Good
22.5.24	Gorran gorras	0		9	97	0		Held – 18m	23.0	30	N/A	00:10	17	W 5	5/8 nil	Fair
23.5.24	Lamorran	0		266	124	1	183	Haul - 29m	18.0	21	2,000	N/A	15	NW 4	4/8	Fair
29.5.24	St Clement	1	25	0		0		Held – 18m	16.4	19	N/A	00:30	11	WNW 3	8/8 nil	Poor
7.6.24	Cowlands	3	27	64	125	1	204	Haul - 29m	16.7	31	540	N/A	16	W 3	7/8 nil	Fair
8.6.24	Penpol	0		13	120	0		Haul - 29m	17.6	35	600	N/A	15	N 3	3/8 nil	Fair
9.6.24	Gorran gorras	0		18	106	0		Held – 18m	23.0	30	N/A	00:10	16	NW 4	7/8 nil	Fair
29.6.24	St Clement	53	33	1	120	0		Held – 29m	19.6 + 19.0	23 + 24	N/A	00:20	17	SW 3	5/8 nil	Fair
6.8.24	Cowlands	378	72	283	158	140	221	Haul - 29m	23.3	30	540	N/A	19	WSW 3	2/8 nil	Good
9.8.24	Gorran gorras	297	66	6	123	0		Held – 18m	23.0	25	N/A	00:10	18	WSW 4	4/8 nil	Good
12.8.24	St Clement	3	66	0		0		Held – 29m	22.0	25	N/A	00:30	22	WSW 3	5/8 nil	Good
16.8.24	Tresemple	597	76	0		0		Trap - Fyke	25.1	34	N/A	06:00	20	NW 3	3/8 nil	Good
18.8.24	Lamorran	0		120	146	0		Haul - 29m	20.1	26	2,000	N/A	21	WNW 3	8/8 nil	Fair
23.8.24	Penpol	99	90	2	160	0		Haul - 29m	19.6	30	600	N/A	17	SSW 3	8/8 light	Poor
30.8.24	Tresemple	5	87	0		0		Trap - Fyke	21.4	34	N/A	06:00	16	NNE 2	4/8 nil	Fair
4.9.24	Penpol	10	66 & 99	0		0		Haul - 29m	19.0	38	600	N/A	15	NNW 4	6/8 nil	Fair
6.9.24	Cowlands	717	90 & 124	1	148	0		Haul - 29m	20.7	27	540	N/A	15.5	ENE 2	8/8 nil	Fair
7.9.24	Ruan	564	88-93	30	154 &169	0		Held – 29m	18.0	33-20	N/A	00:40	16	N 3	8/8 nil - light	Fair
9.9.24	St Clement	11	84	1	150	0		Held – 29m	17.4	25	N/A	00:30	13.5	NNW 4	7/8 nil	Fair
15.9.24	Lamorran	1,564	89	0		0		Haul - 29m	17.7	19	2,000	N/A	18	SW 3	4/8 nil	Good
17.9.24	Gorran gorras	0		0		0		Held – 18m	24.4	21	N/A	00:10	18	E 4	2/8 nil	Good
<b>All</b>	<b>Total</b>	<b>4,302</b>		<b>893</b>		<b>145</b>										

**Table 3 Bass catch summary – HELFORD 2024**

Date	Site	Bass						Method & net	Water				Weather			General conditions
		2024 class		2023 class		2022 class			See spreadsheet notes	Temp (°C)	Sal (‰)	Area (m2)	Total Soak time (h:m)	Air (°C)	Wind Direction & Beaufort	
No.	Ave. TL (mm)	No.	Ave. TL (mm)	No.	Ave. TL (mm)											
7.5.24	Polwheveral	0		127	124	0		Haul - 29m	20.4	25	900	N/A	21.0	NNW 3	3/8 nil	Good
12.5.24	Bonallack	0		4	107	0		Held – 29m	18.7 + 20.0	25 + 16	N/A	00:20	17	SW 3	4/8 nil	Good
26.5.24	Polwheveral	0		114	121	0		Haul - 29m	20.4	29	900	N/A	14.0	W 4	5/8 nil	Fair
27.5.24	Bonallack	0		27	124	0		Held – 29m	16.6 + 17.4	30 + 27	N/A	00:20	12	WSW 4	7/8 nil	Poor
5.6.24	Polwheveral	0		87	124	0		Haul - 29m	20.0	34	900	N/A	17	NW 3	5/8 nil	Fair
6.6.24	Merthen	0		2	126	0		Held – 29m	17.0 + 17.7	33+ 30	N/A	00:20	12	NW 4	2/8 nil	Fair
10.6.24	Bonallack	1	29	30	130	0		Held – 29m	18.6 + 20.4	30+ 18	N/A	00:20	14	N 4	4/8 nil	Fair
5.8.24	Polwheveral	563	71	4	149	0		Haul - 29m	22.0	21	900	N/A	19	S 4	7/8 nil	Fair
11.8.24	Bonallack	124	76	5	159	1	255	Held – 29m	20.3 + 20.4	25+2 1	N/A	00:20	16	E 5	8/8 nil	Poor
24.8.24	Merthen	150	87	0		0		Held – 29m	18.9 – 19.7	36- 34	N/A	00:27	13	WNW 5	5/8 nil	Fair
3.9.24	Polwheveral	7	52 & 95	0		0		Haul - 29m	22.4	35	900	N/A	17	NW 3	7/8 nil	Fair
10.9.24	Bonallack	72	94-98	1	145	0		Held – 29m	17.5 – 17.6	30- 33	N/A	00:40	14	W 5	8/8/ light	Poor
16.9.24	Polwheveral	84	100	0		0		Haul - 29m	22.1	30	900	N/A	18	S 2	3/8 nil	Good
18.9.24	Merthen	28	100	0		0		Held – 29m	16.7- 17.1	31- 30	N/A	00:25	14	E4	6/8 nil	Fair
<b>All</b>	<b>Total</b>	<b>1,029</b>		<b>401</b>		<b>1</b>										

**Table 4 Bass catch summary – Camel & Gannel 2024**

Date	Site	Bass						Method	Water				Weather			Overall conditions
		2024 class		2023 class		2022 class			Temp (°C)	Sal (‰)	Area (m2)	Total Soak time (h:m)	Air (°C)	Wind direction & Beaufort	Cloud & ppt.	
		No.	Ave. TL (mm)	No.	Ave. TL (mm)	No.	Ave. TL (mm)	See spreadsheet notes								
18.6.24	Gannel slipway	0		0		0		Held – 29m	19.9-22.0	38-22	N/A	0:20	18	N 5	4/8 Nil	Fair
2.8.24	Trewornan Dam	10	42	0		0		Haul -29m	22.7	3	300	NA	21	SW 3	8/8 Nil	Fair
14.8.24	Gannel slipway	2	70	1	140	0		Held – 29m	22.7 & 23.6	5 & 5	N/A	0:20	19	NW 4	0/8 nil	Good
13.9.24	Gannel Slipway	0		0		0		Held – 29m	17.7 – 19.0	4-5	N/A	0:30	15.5	SW 3	2/8 nil	Good
<b>All</b>	<b>Total</b>	<b>12</b>		<b>1</b>		<b>0</b>										

**Table 5 Average lengths for ‘0’ and ‘1’ group bass – Fal and Helford 2024**

Fal				Helford			
No. of ‘0’ groups measured	Ave ‘0’ group length (mm)	No. of ‘1’ groups measured	Ave ‘1’ group length (mm)	No. of ‘0’ groups measured	Ave ‘0’ group length (mm)	No. of ‘1’ groups measured	Ave ‘1’ group length (mm)
588	79	335	129	451	86	246	125

## 4.2 Other species

Summaries of other species caught are included in tables on the following pages:

Page 26: Table 6 - Fal

Page 27: Table 7 - Helford

Page 28 Table 8 - Camel and Gannel

It should be noted that fish identification skills vary within the group, and are continually improving. In general, grey mullet of less than about 50mm will be classified as ‘Grey mullet sp.’, rather than trying to assign to a particular species (e.g. thick lipped mullet), unless the operator is confident to do so. Similarly, with gobies - if the operator is confident to assign to a specific species they will do so, otherwise they are classified as ‘goby sp.’ If there is doubt about the species of less commonly encountered fish, this is usually resolved by referring to a fish identification guide, and discussion within or outside the group. We hope to acquire a Perspex fish viewer for next year’s surveys. This enables fish to be viewed in water, allowing, for example, erect fin positions to be better seen and photographed.

As usual, mullet, sand smelt and gobies were quite numerous at times. Appreciable numbers of gilthead bream were found at Cowlands on 6.8.24 (20) and 6.9.24 (30), at Gorrangorras on 9.8.24 (30), and at Polwheveral on 5.8.24 (100).

A total of 27 species (including bass) were netted on the Helford. Notable catches were good numbers of Lesser pipefish (+ some Greater), 2 dragonets, a Brown trout, a Tub gurnard and a seahorse, identified as a male Spiny seahorse (*Hippocampus guttulatus*) by the Seahorse Trust (note this has not been included in Table 7 to conceal the site id and date).



Male Spiny seahorse. Photo: Robin Bradley.



A total of 22 species (including bass) were netted on the Fal. Notable catches included a Black bream and a common dragonet.

A total of 7 species (including bass) were netted on the Camel, including 2 three-spined sticklebacks, and 10 species on the Gannel, including Lesser sandeels.

**Table 6 Summary of other species caught – Fal 2024**

Site and date	Grey mullet sp.	Thick lip mullet	Thin lip mullet	Golden grey mullet	Sand smelt	Common goby/goby sp.	Gilt-head bream	Other species
Penpol 6.5.24	1,000	6	1		100	15		1 x flatfish sp.
Gorranngorras 10.5.24	500	15		4	500	100		None
Cowlands 11.5.24	500	9		4	100			None
Gorranngorras 22.5.24	50	1		5	100	1		1 x shrimp, 5 x Shore crab
Lamorran 23.5.24	1	5			250	1		5 x Shore crab
St Clement 29.5.24		1			4	14		30 x Shore crab, 7 x shrimp, 1 x pilchard
Cowlands 7.6.24	200	11		1	100	1		None
Penpol 8.6.24	500	19		1	500	3		1 x plaice
Gorranngorras 9.6.24	200	20		8		1		1 x Black bream
St Clement 29.6.24		1	1		59	25		4 x shrimp/prawn, 5 x shore crab, 1 x pilchard, 1 x Lesser pipefish
Cowlands 6.8.24	500	1	1	2	100		20	None
Gorranngorras 9.8.24	600	7	2		25		30	10 x Shore crab
St Clement 12.8.24					9			1 x flounder, 8 x Shore crab
Tresemple 16.8.24	3		2	1				5 x Shore crab
Lamorran 18.8.24	125	2	2		100	4	1	None
Penpol 23.8.24	300	10						20 x Shore crab
Tresemple 30.8.24								10 x Shore crabs
Penpol 4.9.24		2,000		1	200	4		None
Cowlands 6.9.24	200	1	1		1	1	30	None
Ruan 7.9.24	200	13		1	1104	401	1	1 x dragonet
St Clement 9.9.24	60	1			11	25		2 x prawns, 1 x Sand goby, 25 x sprat
Lamorran 15.9.24	200	1		1		10		None
Gorranngorras 17.9.24		5,000						None

**Table 7 Summary of other species caught – Helford 2024**

Site and date	Grey mullet sp.	Thick lip mullet	Thin lip mullet	Golden grey mullet	Sand smelt	Common goby	Gilt-head bream	Other species
Polwheveral 7.5.24	1				500			1 x Brown trout
Bonallack 12.5.24	5	2	6		1	50		60 x Lesser pipefish, 1 x Shrimp, 1 x flatfish sp. 10 x Shore crab
Polwheveral 26.5.24	500	2			50		5	None
Bonallack 27.5.24	31	2	10		17	56		30 x shrimp, 60 x Shore crab, 51 x Lesser pipefish, 1 x pollack, 2 x Dover sole
Polwheveral 5.6.24	1,000	13		2	500	3		2 x Painted goby, 1 x pilchard, 2 x Shore crab
Merthen 6.6.24	550	13		2	21	4		1 x Greater pipefish, 6 x Shore crab, 1 x Thornback ray
Bonallack 10.6.24	51	14	3	2	3	6		2 x Painted goby, 4 x pipefish sp. 1 x pilchard, 10 x Shore crab
Polwheveral 5.8.24	200	2	4		25	3	100	5 x Shore crab
Bonallack 11.8.24	200	2	3	5	50	150	3	2 x Lesser pipefish, 1 x Shore crab, 7 x pilchard, 1 x Tub gurnard
Merthen 24.8.24	250				725			23 gobies – probably Sand gobies, 4 x prawns, 1 x sprat, 37 x pipefish sp., 30 x shore crab, 2 x greater pipefish
Polwheveral 3.9.24		5,000		4	50	4	1	3 x Painted goby
Bonallack 10.9.24	230	2			7	50		30x shore crab, 2 x pilchard, 3 x sprat, 2 x shrimp/prawn, 4 x pipefish sp.
Polwheveral 16.9.24	500			5	1		1	None
Merthen 18.9.24	50	500			550	700		100 x Shore crab, 51 x shrimp/prawn, 4 x Painted goby, 2 x dragonet, 3 x pipefish sp.

**Table 8 Summary of other species caught – Camel & Gannel 2024**

<b>Site and date</b>	<b>Grey mullet sp.</b>	<b>Thick lip mullet</b>	<b>Thin lip mullet</b>	<b>Golden grey mullet</b>	<b>Sand smelt</b>	<b>Common goby/sp.</b>	<b>Gilt-head bream</b>	<b>Other species</b>
Gannel slipway 18.6.24				1		35		None
Trewornan Dam 2.8.24	200	5	6			200		6 x flatfish sp., 2 x three-spined stickleback
Gannel slipway 14.8.24	500	6	1	2				30 x Lesser sandeel, 1 x flounder
Gannel slipway 13.9.24	200	5		4		125		2 x shrimp/prawn, 5 x Lesser sandeel, 1 x flounder

## 5. DISCUSSION & CONCLUSIONS

Weather conditions appear to have resulted in good first-winter survival of 2023 '0' groups, and facilitated a successful spawning and settlement in 2024.

### 5.1 Year Class assessment – 2023

**Catches of '1' group bass in the Fal and Helford estuaries, particularly in May and June, confirms our provisional assessment of 'Good' for the 2023 year class in the Fal and Helford SAC.**

The Langstone Harbour Small Fish Survey 2023 reports <sup>viii</sup> an abundance of bass with an average size of 60mm, giving further support to this assessment.

### 5.2 Year Class assessment – 2024

We found '0' groups earlier, and smaller than we ever have before, prompting us to wonder if spawning is taking place closer inshore than previously.

When people talk about year class strength for bass, it is usually in terms of whether this is 'good' or 'poor' etc. Our assessment of year class strength has traditionally been based on the total number of '0' groups netted, and the number and size of good catches. Since 2022, we have also considered Catch Per Survey figures as supportive information, in an attempt to improve the robustness of the assessment by introducing a statistical element, accepting that the presence of juvenile bass in estuaries may be unpredictable, due to the number of factors (both biotic and abiotic) which affect this. In time, we may be able to produce defined limits to delineate one assessment category from another on the basis of CPS (and possibly other indices).

A total catch of 4,302 '0' groups netted on the Fal for the whole survey programme, with a CPS of 326 for the August and September Surveys (including the 2 Fyke net surveys), and some very good individual catches, allows us to make a provisional assessment of 'Good' for the 2024 year class on the Fal. A catch of 1,564 at Lamorran on 15.9.24 was only just short of the record for this site (1,666) set in 2014, one of the best year classes we've seen in recent times. Similarly, a catch of 564 at Ruan on 7.9.24 was only just short of the record for this site (584), also set in 2014. Total catches might have been even higher, but for some unexpected poor results. However, in the absence of a defined numerical measure of year class quality, these findings must be seen in the context of generally lower recruitment since 2008 (i).

A total of 1,029 '0' groups netted on the Helford over the whole survey programme, with a CPS of 147 for the August and September surveys, and some good individual catches in August, allows us to make a provisional assessment of 'Good' for the 2024 year class on the Helford. Results are less convincing than for the Fal, possibly because catches were less than anticipated in September.

**Taking the '0' group results for both estuaries into account allows us to make a provisional assessment of 'Good' for the 2024 year class in Fal and Helford SAC. We**

can't be sure how good, but the 'acid test' will be how many 30cm+ bass we see in fishing reports in about 4 years' time.

There were reports of good numbers of very small '0' groups in late May/early June in other areas. Ryan Hepburn (Plymouth University) reported seeing lots of these in Christchurch Harbour at this time. A few 20mm '0' groups were found on the Erme estuary during the FinVision workshop on 15.6.21. Large numbers of '0' group bass (mostly 20-30mm) were found during a Living River Foundation survey on Deptford Creek in London on 23.6.24.

For this year's report, we have amended, and simplified the CPS table (see Table 9 below) to focus on '0' groups, as these form the basis of our provisional assessment. This table shows CPS figures against our assessment (colour coded) of year class strength (see above for an explanation of how we have arrived at this).

As table 9 shows, the 2024 CPS value for the Fal for surveys (excluding Fyke net surveys) during July – October (August and September in this case) is 331.2. This is of the same order of magnitude (or greater) as most of the previous years identified as 'Good' or 'Fair/Reasonable', and certainly much higher than any of the 'Poor' years. The 2024 CPS value for the Helford is 146.9, which is significantly lower than the Fal. It's interesting to note that this is a reversal of what we saw last year. The Helford CPS is lower than previous 'Good' years, with the exception of 2014 (with which it is similar), but is clearly higher than most of the 'Poor' years. The combined Fal and Helford CPS is 259.5, which is comparable with previous years assessed as 'Good' and higher than any of the previous years assessed as 'Poor'.

**Table 9 ‘0’ group Catch Per Survey – Fal and Helford**

Year Class Assessment (Fal & Helford)	Fal			Helford			Fal & Helford combined		
	No. of surveys (July – Oct)*	0 group totals	Catch per survey	No. of surveys (July – Oct)	0 group totals	Catch per survey	No. of surveys (July – Oct)	0 group totals	Catch per survey
2024 (P)	11	3643	331.2	7	1028	146.9	18	4671	259.5
2023	13	544	41.8	3	1363	454.3	16	1907	119.2
2022	5	39	7.8	2	57	28.5	7	96	13.7
2021	3	1195	398.3	4	143	35.8	7	1338	191.1
2020**	2	0	0.0	1	98	98.0	3	98	32.7
2019	3	1578	526.0	1	803	803.0	4	2381	595.3
2018	4	47	11.8	4	99	24.8	8	146	18.3
2017***	2	207	103.5	2	764	382.0	4	971	242.8
2016	3	872	290.7	3	2639	879.7	6	3511	585.2
2015	5	228	45.6	5	479	95.8	10	707	70.7
2014	5	3107	621.4	5	783	156.6	10	3890	389.0
2013	7	521	74.4	5	536	107.2	12	1057	88.1
2012	4	157	39.3	4	648	162.0	8	805	100.6
2011	7	558	79.7	5	133	26.6	12	691	57.6
2010	4	88	22.0	8	73	9.1	12	161	13.4
2009	4	35	8.8	2	27	13.5	6	62	10.3
2008	4	6	1.5	3	39	13.0	7	45	6.4
2007	10	565	56.5	4	550	137.5	14	1115	79.6
2006	8	17	2.1	4	68	17.0	12	85	7.1
2005	7	1	0.1	7	92	13.1	14	93	6.6
2004	10	89	8.9	5	32	6.4	15	121	8.1
2003	6	320	53.3	0	-	-	6	320	53.3
2002	11	551	50.1	3	152	50.7	14	703	50.2
2001	11	14	1.3	3	3	1.0	14	17	1.2
2000	3	3	1.0	4	48	12.0	7	51	7.3

\* Excludes Fyke net data (commenced 2024). \*\* Covid affected survey programme. \*\*\*Assessment uprated following reappraisal of conclusions in 2017 & 2018 annual reports.

Assessment key (P = Provisional) Inconclusive Poor Fair/Reasonable Good

Figure 4 below illustrates the above CPS figures graphically. Considering both estuaries, 2014, 2016, 2019, 2021, 2023 and 2024 appear to be the better years. Prior to 2014, the figures look poor, despite the fact that we have previously assessed 2002 and 2007 as good year classes. After 2013, the figures look much better, although there are several poor years - 2015, 2018, 2022 (2020 inconclusive as Covid affected survey programme) during this time. The trendline appears to show that spawning and settlement success is increasing over time, but this must be seen in the context of generally lower recruitment levels since 2008 (as shown in the Solent survey historical recruit index) (i). If this increase is genuine, could this be as a result of climate change?

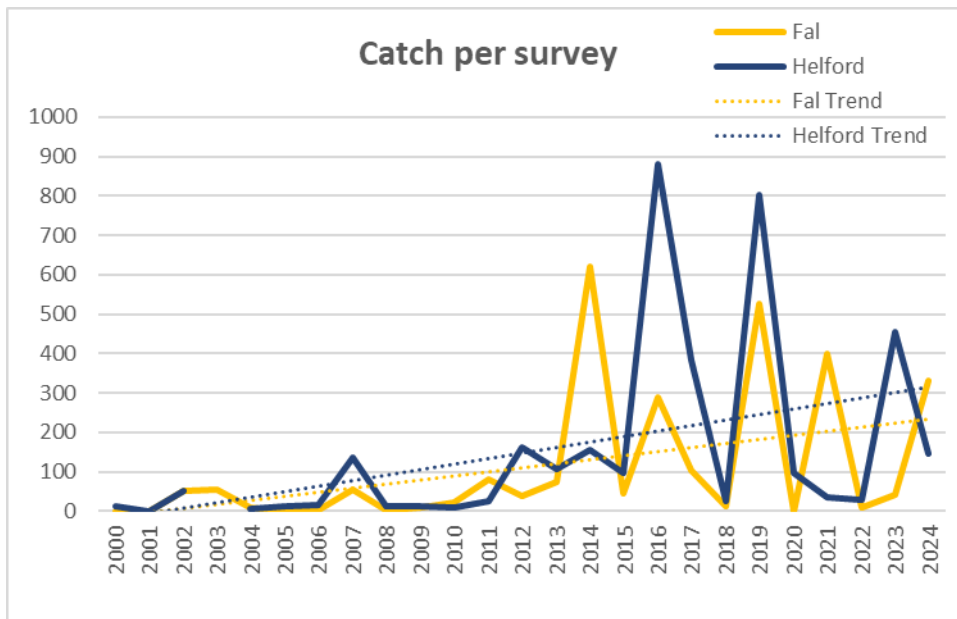


Fig. 4 ‘0’ group Catch Per Survey figures for the Helford and Fal since 2000 with trendline

Our year class assessment has always covered both estuaries in the Fal and Helford SAC. Wide scale environmental and oceanographic factors (sea temperature, winds, currents etc.) which influence spawning and settlement success are likely to affect the Fal & Helford similarly. It is therefore interesting to note the different results obtained in the two estuaries in some years. This illustrates the value of taking both sets of results into account when deciding on the overall assessment for the SAC. The reasons for the differences are, as yet, unclear.

The effects of weather, food availability, salinity changes etc., may have affected fish movements within the estuary system, and resulted in lower than expected catches at some sites this year.

In an attempt to further add to the statistical basis of the assessment, we have also calculated Catch Per Area (CPA) and Catch Per Minute (CPM) indices for ‘0’ groups for surveys carried out during August and September. For CPA, the total catch from all ‘haul’ surveys during this period in the relevant estuary is divided by the total area netted in these surveys. For CPM, the total catch for all ‘held’ surveys during this period in the relevant estuary is divided by the total soak time in these surveys. These indices reflect the fact that catches may be influenced by the area netted in surveys where the net is hauled, and by the length of time the net is held in the water (‘soak time’) during surveys when the net is held. ‘Haul’ surveys



are attempting to catch fish which are already present in the area, and are usually only done once, at the same stage (and height) of the tide. 'Held' surveys are attempting to catch fish which are moving through with the tide, and several replicates (runs) are usually performed. While we aim to carry out these replicates at the optimum times based on past experience, a certain amount of non-productive netting is possible if we are to avoid missing fish on a given day. Any such time is included in the total soak time for each survey.

The 2024 CPA value for the Fal is 0.44 fish/m<sup>2</sup>, and for the Helford is 0.24 fish/m<sup>2</sup>. The 2024 CPM value for the Fal is 7.29 fish/min, and for the Helford is 3.34 fish/min. For comparison, CPA and CPM values for what is considered a good year (Fal, 2014) are 0.60 and 5.74 respectively, and for a bad year (Helford 2018) 0.03 and 0.88 respectively.

It may be that these statistics (and others) may be of help in providing a statistical basis for delineating 'Poor' year classes from 'Good' (or 'Very Good') ones. As yet they are purely used as supportive information.

### **5.3 Bass Growth**

The Helford average '0' group length (86mm) for this year's surveys is slightly higher than the Fal (79mm). The Fal average '1' group length (129mm) is slightly higher than the Helford (125mm). Whether the differences in '0' and '1' group lengths between the estuaries are significant is difficult to say without further data and analysis. We will monitor these average lengths going forward.

By mid-September we were seeing average '0' group lengths of 100mm on the Helford. This looks similar to the trend for recent years (since 2018), but is significantly higher than most of the years before this. By mid-August we were seeing average '1' group lengths of 159mm on the Helford, which seems poor in comparison to past years.

By mid-September we were seeing average '0' group lengths of 88-93mm on the Fal. This seems slightly lower than the trend for recent years (since 2018), but better than many of the years before this. By mid-September we were seeing average '1' group lengths of up to 169mm. This seems slightly lower than the trend for recent years (since 2018), but similar to the trend for the years before this.

Figures 5 & 6 below show the highest average length of '0' groups from all surveys during August over the years with trend line for the Fal and Helford.

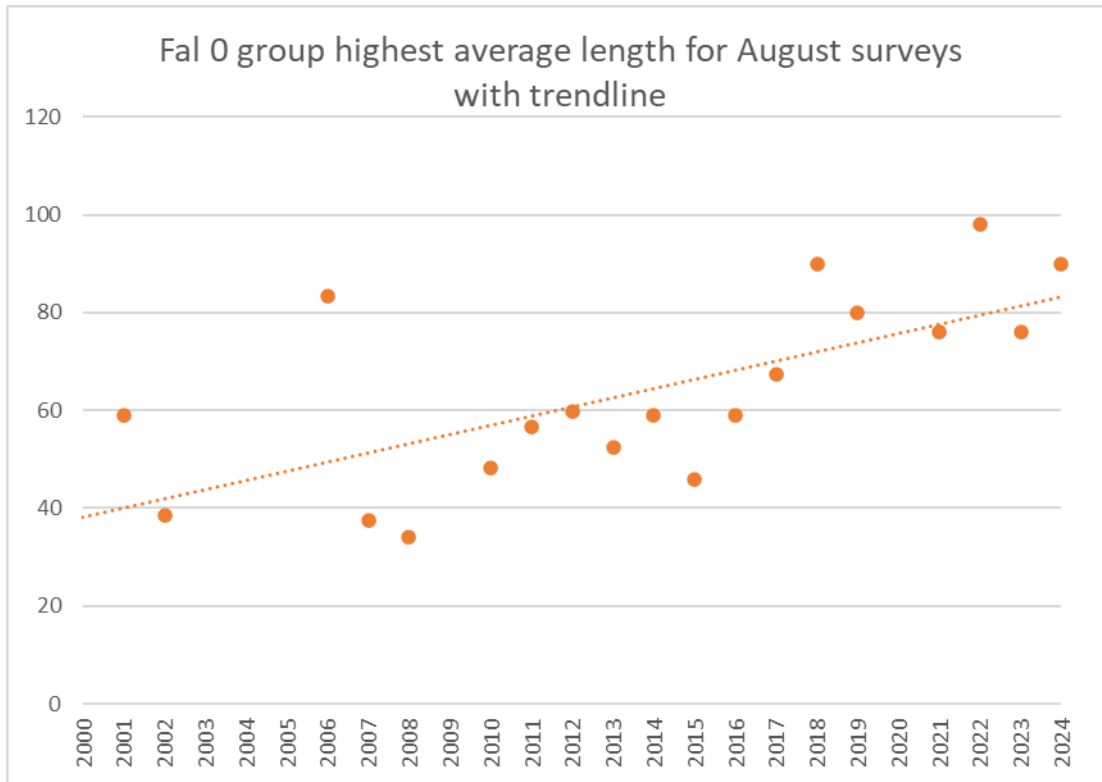


Fig. 5 Fal ‘0’ group highest average length (mm) for August surveys with trendline

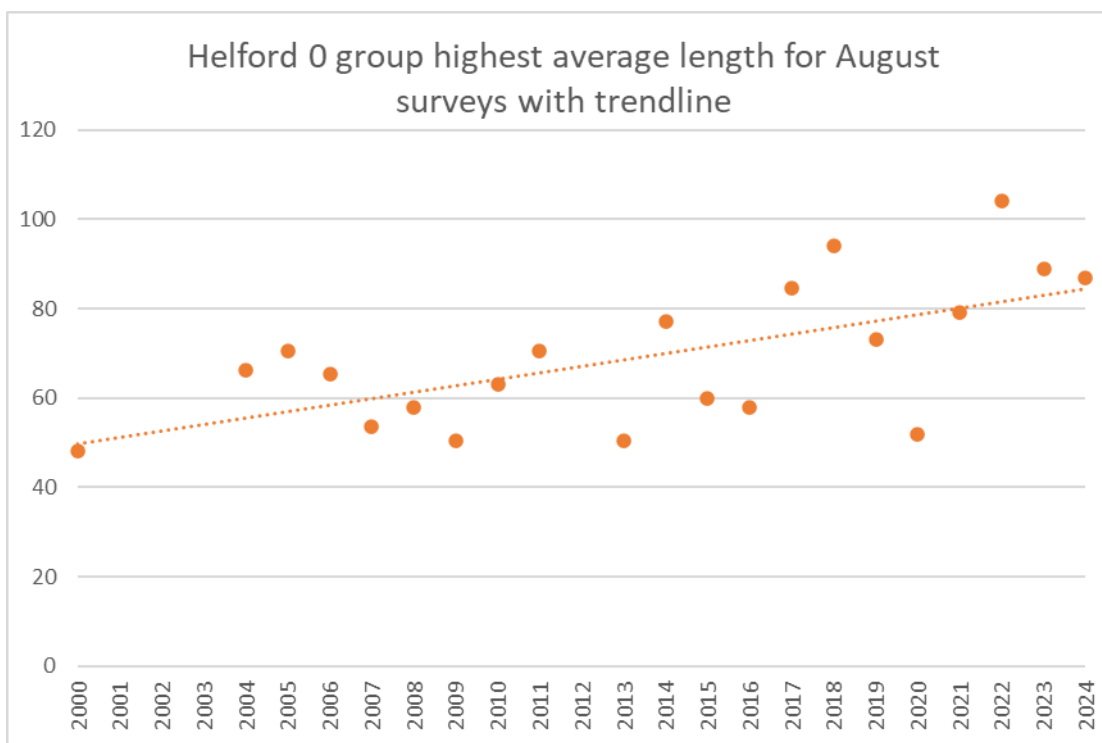


Fig. 6 Helford ‘0’ group highest average length (mm) for August surveys with trendline

Despite the gaps in the data, the trendline appears to show that the average size of ‘0’ groups in August is increasing over the years in both estuaries. Could this be as a result of warming water temperatures? In both estuaries, the peaks occur in 2018 and 2022 – both years we

assessed as poor year classes. Does this suggest that growth is better when there are fewer '0' groups to compete for food?

Much more data would be needed to confirm these observations, and it must be remembered that average size measurements at any given time will be influenced by spawning date and proximity - earlier spawning and arrival in nursery habitats means that fish will have had more time to grow by August.

#### **5.4 Other species**

While bass is the focus of our work, monitoring all the other species we find adds considerable value to our data. It is hoped that the digitisation of all our previous survey reports will make this data more accessible, thereby facilitating research into biodiversity and climate change.

### **6. OTHER OBSERVATIONS**

The finding of an '0' group bass with a morphological variation at Polwheveral on 6.8.24 prompted discussion. Such variations are not uncommon, but this 'stub-nosed' bass looked quite extreme. Possible hybridisations, for example with gilthead bream, are unlikely. Reports of hybridization in marine fish are generally restricted to species in the same genus (shad, possibly sand gobies) or family (some flatfish). With thanks to Jim Ellis (Cefas).



'Stub-nosed' '0' group bass. Polwheveral 6.8.24. Photo: Rob Foote.

### **7. DEVELOPMENTS/FUTURE ACTIONS**

1. From 2025, we will discontinue the Camel and Gannel surveys.
2. Fyke netting will be carried out on a regular basis, and extended to the Helford next year if trials can identify a suitable site.
3. With '0' groups seemingly arriving earlier, we will trial the use of a short fine-mesh inter-tidal net on surveys in May and June. Most of the very small '0' groups at this time probably pass through the seine net we use routinely, hopefully without harm. Careful and limited use of a short intertidal net may detect more of these, while at the same minimising damage to them. We will need to think carefully about how we use

any data arising from this (and Fyke netting) for comparability reasons as they are departures from our traditional methods.

4. We hope to obtain a Perspex fish viewer for use when species identification in doubt.
5. We will continue working with ERCCIS to digitise the remaining data from our annual reports.
6. We will work with colleagues to collate reports from juvenile/small fish surveys from around the UK to compare data on '0' and '1' group bass abundance.
7. We will offer help and advice to others who may wish to set up similar survey programmes in their own areas.
8. For species other than bass, we will aim to measure 20 fish if more than this number are present.

## **8. ACKNOWLEDGEMENTS AND THANKS**

I would like to express my sincere thanks to the following:

Derek Goodwin MBE, whose tireless work over many years in setting up and leading the surveys has provided a valuable long-term time series of citizen science-generated data on bass recruitment. Derek's advice and support has again been invaluable this year.

The Helford Marine Conservation Group, in particular Dr Pamela Tompsett, for their foresight in instigating these surveys in 1994, and extending them to the Fal in 2000, and for their continued support. So much is owed to them, and the late Leslie Collins, chairman of the group, for their support particularly in those early years when results were so poor during the "learning period".

The Bass Anglers Sportfishing Society for their ongoing support.

Our fantastic volunteers, without whom this work would not be possible. Those who have participated in surveys this year include: George Brew, Jason Collins, Brian Collick, Mark Champion, Richard Flage, Rob Foote, Eddie Gummow, Roy Hohlweg, Ben Harris, Rob Hillman, Ian Ingram, Gav Ingram, Dave Jones, David Kelley, Will Leedham, Paddy Penhaligon, Harry Polkinghorne, John Shipwright, Rob Spence, Matt Spence, Hedley Thomas, Dr Frank Van-Veen, Bradley Wiffen, Jon Williams, David Wilson.

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Simon Cadman from the Cornwall Inshore Fisheries and Conservation Authority (CIFCA) for his support, and authorisation to use a seine net for conducting bass and juvenile fish research work in specified rivers and estuaries in Cornwall, with the addition of retaining undersized bass for Plymouth University.

The Truro Harbour Office.

Patrick Polglase and Sharon Bowden at the Duchy of Cornwall for permission to net their fishery in the Helford, and use a Fyke net on the Fal.

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The MMO for their dispensation allowing us to remove juvenile bass by boat in a Bass Nursery Area for research.

The EA for their authorisation to use a Fyke net.

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Dr Kieran Hyder and the team at Cefas for including our data in publications, and for analysing and preparing our data for submission to the ICES bass stock assessors.

## **9. APPENDICES**

### **9.1 PERMISSIONS**

#### **Cornwall Inshore Fisheries and Conservation Authority (CIFCA)**

Authorisation to use a seine net for conducting bass and juvenile fish research work in specified rivers and estuaries in Cornwall, with the addition of retaining up to 360 undersized bass for Plymouth University, was obtained from CIFCA. In the event, a total of 132 bass were retained (55 '0' groups and 77 '1' groups) from across the Helford and Fal.

Each survey is notified to Simon Cadman, CIFCA Principle Enforcement Officer, in advance. Also, Sally Gallop, Technical Fisheries Officer at the Environment Agency; Truro Harbour Office; Patrick Polglase, Duchy of Cornwall; Hayle and Plymouth offices of the MMO.

Two CIFCA enforcement officers made a pre-arranged inspection visit on 23.8.24 at our Penpol site.

#### **Marine Management Organisation**

A dispensation from the requirements of the Statutory Instrument 1156/1990 Bass (Specified Areas) (Prohibition of Fishing) Order 1990 was obtained to allow us to retain up to 360 undersized bass for research. This enabled us to transport these fish by boat in a Bass Nursery Area from the collection site to the disembarkation point.

#### **Duchy of Cornwall**

The Duchy of Cornwall own the fishing rights on the Helford, and permission to net the river was obtained. This involves providing proof of public liability insurance cover, risk assessments of the activities undertaken, and other necessary consents, including that from CIFCA.

#### **Environment agency (EA)**

Authorisation to use a Fyke net at the Treseuple site on Tresillian River was granted by the EA. Permission was also granted by the landowners, the Duchy of Cornwall.

### **9.2 INSURANCE**

Public Liability insurance of £5,000,000 per claim (£5,000,000 in total for products liability), and Employer's Liability insurance of £10,000,000 per claim for the netting work was obtained from Markel Insurance Company.

The Public Liability cover requirement will increase to £10,000,000 in 2025.

Volunteers using their own boat for surveys must have the same level of Public Liability cover, and notify their insurers of their involvement in the surveys, including conveying volunteers to sites.

### **9.3 SAFETY & INFORMATION**

Risk assessments are available for each site, and are reviewed annually. Generic safety points from these are included in an information document provided to each volunteer on joining the group, and reissued annually after updating, along with copies of each risk assessment. The document also includes general information, such as the purpose of the work.

The scheme organiser is present at all surveys, and runs through the procedures and any risks involved with volunteers who are attending a survey for the first time.

The scheme organiser attended a RYA First aid course in February 2022 provided locally by Falmouth Training Solutions. This will be repeated in February 2025.

There were 2 safety incidents recorded, both on the same day (24.8.24) at the Merthen site. One involved a volunteer slipping while carrying the net box (with another volunteer) around the base of rocks and breaking his wrist. The second involved a volunteer getting stuck in the mud while attempting (with another volunteer) to pull the net box around the base of a fallen tree. We were only able to extricate him with some difficulty.

A couple of points are worth mentioning in connection with these incidents. We had been trialling Quechua Large Deck Snowshoes as a way of improving safety while walking on mud. Experience (such as the trip incident above) has shown that they are not suitable for walking near rocks, or in the water, but otherwise can be useful e.g. if walking over large areas of plain mud. The use of a redundant foam/plastic surf body board facilitates the extraction of volunteers from mud (as demonstrated in the incident above), and aids pulling the net box over mud when used as a base.

### **9.4 COSTS & FUNDING**

The survey work is organised and carried out by volunteers, who give their own time freely. Likewise, they cover their own travel costs to each survey site/embarkation point.

Insurance (see above) costs for the scheme amount to £100. This is likely to increase substantially when the Public Liability cover requirement is increased to £10,000,000 next year. Where volunteers, who use their own boats on surveys, incur insurance costs over and above what they would normally have for their own boat usage, we will attempt to cover 50% of this extra cost if the volunteer requests it.

Fuel costs for boats travelling to survey sites are not insignificant. A contribution of 50% towards this will be offered.

Storage costs for the dinghy amount to £140pa.

Equipment costs include larger purchases, such as replacement, or additional nets (typically around £1,500 for the main net), and smaller purchases such as thermometers, air pumps, buckets, life jackets, etc. (anything from £10 to £100). Net tears are usually repaired at no cost by one of the helpers. Individuals provide their own wetsuits/drysuits/waders etc. This year we purchased 2 pairs of Quechua Large Deck Snowshoes (£120 in total) see above.

Costs are currently borne by the scheme organiser, or individual boat owners, in the first

instance. A Fyke net for use by the group was purchased by BASS, who are partnering Plymouth University on the 'FinVision' Fisheries Industry Science Partnership project. The cost of this, and also of dingy storage and insurance, was reimbursed from FISP funds.

## **9.5 NETTING METHODS and NET SPECIFICATIONS**

Methods and nets used on individual surveys are specified in the CBIG survey data spreadsheet available on the CBIG website (survey data page)

### **Netting methods**

Haul 1: The net is drawn across the mouth of an inlet or corner, and hauled once towards the head of the inlet or corner, on the late flood tide, before bringing the net ends together and bringing the catch ashore.

Haul 2: The net is drawn across a shallow gully just before the water spills over onto the mud flats, and hauled up the gully to its head on the late flood tide, before bringing the net ashore.

Haul 3: A small net may be hauled through a pool left by the falling tide.

Held: The net is held across the tide, perpendicular to the shore, before the far end is brought to the near bank in a 'J' pattern.

Trap: net set on incoming tide, with trap entrance facing upstream. Lifted as soon as water level drops enough to allow access to cod end. Soak time estimated from time when net adequately covered to when lifted.

### **Net specifications**

Seine 29.5m x 2m x 5mm mesh - knotless. Without central bunt. Wooden poles fitted. Ropes attached to floatline.

Seine 18.3m x 1.8m x 6.5mm mesh - knotless. Without central bunt. Wooden poles fitted. Ropes attached to floatline.

Seine 10m x 2m x 5mm mesh - knotless. Without central bunt. Wooden poles fitted. Ropes attached to floatline.

Fyke 2.75m x 53cm, 6.5-8-10mm mesh; 5m leader. Single, winged x 2 (5 x 0.5m), 5 hoops. D shaped entrance aperture (47cm wide). 3 chambers. Otter guard fitted.

**Robin Bradley**  
**Cornwall Bass Investigations Group**  
**18.11.24**



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