

Bass Investigations in Cornwall

Annual report for 2023

This report is based on information collected in a voluntary capacity by a group of citizen scientists, to improve the understanding of the status of juvenile bass within the Fal and Helford Special Area of Conservation, and recently the Camel and Gannel estuaries. Since 2021 this report has been produced by Robin Bradley in conjunction with, and based on the template previously used by, Derek Goodwin.

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.

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.



CONTENTS

	Page number(s)
Summary	3
1. Introduction	4
2. Methods	5-6
3. Results	7-15
4. Discussion and conclusions	16-21
5. Future actions	21
6. Other observations	22
7. Acknowledgements and thanks	22-23
References	23
8. Appendices	24-72
Sites	24-32
Permissions	32-33
Insurance	33
Safety and information	33
Costs and funding	33-34
Survey reports	35-72

SUMMARY

The group has gone from strength to strength, both in terms of our activities (31 surveys completed in 2023) and the number of volunteers involved (47). We now have a formal name - “Cornwall Bass Investigations Group”, and a logo to go with it. We also now have our own website (search under group name), which includes news, general information and previous annual reports.

This year we have assisted a PhD student from Plymouth University who is conducting research on bass growth in estuaries in the Southwest. We have also assisted Plymouth University in deploying their Juvenile Habitat Monitoring Camera as part of the “FinVision” Fisheries Industry Science Partnership project, involving the University and the Bass Anglers’ Sportfishing Society (and other partners).

Catches of ‘0’ groups last year were low, and our initial conclusion was that the 2022 year class was a poor one. Catches of ‘1’ groups this year have been consistently low/absent. In light of these results, and the fact that first-winter losses are likely to have been low, we feel confident in confirming this assessment that the **2022 year class was a poor one** in our survey area.

We first encountered ‘0’ groups in mid-June - the earliest we’ve ever seen them. Good numbers were found on the Helford when surveys resumed in August, the largest catch being 954 on 13th September at Polwheveral. This is the second highest catch at this site in 24 years.

Catches of ‘0’ groups on the Fal were mixed, but it must be borne in mind that, unlike on the Helford, we were unable to survey either of the long-standing sites (Lamorran and Ruan), which require a boat to access them. Nevertheless, some good catches were made, the best being 246 on 18th September at Gorrangorras.

Our results allow us to conclude that **the 2023 year class is a good one on the Helford**. Although less clear, there are enough good results to suggest that **this is the same on the Fal**.

We have had some success on the Gannel Estuary, and it is hoped that this new site will give us an indication of spawning and settlement success on the north side of the Cornwall peninsula in the future. However, we do not yet have the confidence in either the Camel or Gannel results to make an assessment of this at this stage.

A range of ‘0’ group sizes were found in mid-September at Gorrangorras on the Fal, including some that were small for the time of year, possibly indicating a later (? May/June) spawning cohort.

Temperature probably had a significant effect on settlement success, both in terms of the good numbers of ‘0’ groups found, and their early arrival.

On the Fal, growth appeared good for both ‘1’ groups and ‘0’ groups. Growth of ‘1’ groups on the Helford was difficult to assess, since we only have lengths to 17th June, but growth of ‘0’ groups was good.

1. INTRODUCTION

Perhaps the first thing to note is the revised report format. For the convenience of the reader who wishes to focus on the general aspects of the report, administrative elements and site descriptions, have been moved to the appendices.

For insurance purposes, we were required to come up with a name for the group. Although the group has close links with both the Helford Marine Conservation Group and the Bass Anglers' Sportfishing Society, it has always been run as an independent group. "Cornwall Bass Investigations Group" was chosen to reflect the terminology used throughout reports over the years. We have a logo to go with this (see p1: photo credit Peter Maddern).

The group has gone from strength to strength, both in terms of our activities (31 surveys completed in 2023) and the number of volunteers involved (47).

We now have our own website (search under group name). We wanted to have an easy way of communicating information about our activities, and about bass recruitment in general. All our previous annual reports can be found on the site, and we hope that researchers may find these useful.

This year we were unable to survey any sites which require a boat for access. In an effort to find new shore-accessible sites, and develop existing/old sites, we have undertaken 20 surveys on the Fal. This has involved undertaking trial surveys, some of which were unproductive. By finding ways to access sites from the shore which were previously only reachable with a boat (Bonallack), we managed to complete six surveys on the Helford. We should have some access to boats in 2024, and this will enable us to conduct limited surveys at established sites on the Fal (Lamorran and Ruan) and Helford (Merthen). We have also conducted five surveys on North coast estuaries, including, for the first time, the Gannel estuary near Newquay.

The group submitted a detailed response regarding bass recruitment as part of the bass Fisheries Management Plan consultation. This is available on our website under Latest News.

This year we have assisted a PhD student from Plymouth University (Rachel Turnbull) who is conducting research on bass growth in estuaries in the Southwest. We have also assisted Plymouth University (under Dr Ben Ciotti) in deploying their Juvenile Habitat Monitoring Camera as part of the "FinVision" Fisheries Industry Science Partnership project, involving the University and the Bass Anglers' Sportfishing Society (and other partners).

2. METHODS

Equipment - nets

The main net used is a freshwater beach seine, approximately 29.5 metres long and 2 metres deep, constructed on 5mm white knotless nylon netting with 8mm head rope with floats and 12 mm leaded ground rope. Wooden poles were fitted at the ends of the net after purchase. No cod end was fitted to avoid crowding casualties.

A new net of the same dimensions (210/6 x 5 mm - 29.5 mtrs x 2 mtrs deep, CN3 floats @ 12" & 3oz barrel leads @ 12") was purchased from Collins Nets during the year with funds from the "FinVision" FISP project involving Plymouth University and the Bass Anglers' Sportfishing Society.

A shorter net, 18.3 metres long by 1.8 metres deep, constructed on 6.5mm knotless nylon netting, is used where the longer net is not required. When this net is used, it is noted in the survey reports and summaries.

A 10 x 2m net, constructed on 5mm white knotless nylon netting, is used for netting small pools. When this net is used, it is noted in the survey reports and summaries.

Equipment - other

Buckets with a capacity of 5 gallons (23litres) are used to keep fish for measuring after a haul. Two battery operated aerators are used to keep the fish alive in the bucket. On hot days, the fish are measured before any further hauls, as increased water temperature can lead to casualties. Once measured, the fish are discarded downstream.

A battery operated digital thermometer is used for measuring water temperature. A standard outdoor/garden thermometer is used to measure air temperature.

Salinity was measured routinely using an ATAGO S/Mill-E refractometer (supplied by Dr Pamela Tompsett, Helford Marine Conservation Group).

A short piece of white half-round plastic guttering, with end stop and measuring tape attached, is used for measuring total length to the nearest 0.1 cm.

To measure the depth of water, a stick marked every six inches is available. This also has a piece of wood, three inches by three inches square and painted white, secured at one end for checking water clarity. In practice, depth is usually estimated when wading, and clarity from visual assessments.

A boat suitable for exploring shallow creeks, and capable of resting on dry sand/mud at low tide, is needed for access to the Ruan and Lamorran sites on the Fal, and Merthen on the Helford. The boat should be fitted with a suitable engine and backup. Ideally it should have built in buoyancy and will therefore stay afloat if holed. A minimum capacity to carry three adults plus equipment is required. A useful fitting is a sonar/GPS.

A dinghy is needed for certain sites e.g. Lamorran. A 2.5-metre long inflatable dinghy is used and is fitted with a small Honda outboard motor as & when required. The inflatable is towed by the main boat.

Netting methods and sites

Several methods of netting are employed:

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. Examples include Polwheveral on the Helford, Penpol on the Fal, and Trewornan Dam on the Camel. It may not always be necessary to span the whole creek (e.g. Cowlands).
2. The net is drawn across a shallow gulley and hauled up the gulley to its head on the late flood tide, just before the water spills over onto the mud flats, before bringing the net ashore (e.g. Lamorran on the Fal).
3. The net is held across the ebb tide for 10 minutes in a channel, perpendicular to the shore, before the far end is brought to the near bank in a 'J' pattern. Netting usually starts 2-3 hours before low water. This may be repeated, the number of attempts being noted on survey reports. It is not always necessary to span the whole width of the channel. Examples include Bonallack and Merthen on the Helford, and Ruan and St Clement on the Fal. On some sites the netting is done earlier in the ebb (e.g. the Gannel), or on the early flood (e.g. Gorrangorras on the Fal).
4. A small net may be hauled through a pool left by the falling tide. Examples include Polingey on the Fal and the Rail Bridge Pool on the Camel.

With all these methods timing can be critical, and it may take some time to establish the most productive pattern for each site. A description of each site is included in the appendices.

Personnel

Interest in the group has grown, and it goes from strength to strength. Currently we have 47 volunteers from a range of backgrounds (anglers, commercial fishermen, scientists, conservationists) who give their time freely, and bring a number of very useful skills (e.g. netting techniques) and knowledge (e.g. fish id) to the group.

Bass age and growth assessment

The following has been taken from "Guidelines for beach-seine surveys of 0-gp and 1-gp bass (*Dicentrarchus labrax*) in UK nursery grounds." Cefas:

"Aging of 0 and 1 year olds in existing seine net surveys has been based on size, with age 0 bass classed as fish that entered the system at a minimum of 3cm in July and then grew to a maximum of 9cm by the end of autumn. An age 1 bass in the Fal - Helford surveys was classed as a fish caught in spring and early summer between 9- 14cm and that grew to a maximum of 17cm by the end of autumn. If a bass was caught between 17-21cm in spring and early summer it was classed as an age 2 bass, though if there was any uncertainty of the age at these lengths a scale sample was taken. Scale samples were always taken from any captured bass over 21cm to determine age because of the increased uncertainty in the age-length ratios."

3. RESULTS

Results are presented in the following tables:

- Summaries of bass catches on the Fal, Helford and other estuaries in Tables I to III (p8-9)
- Updated catch per survey figures for the Fal and Helford in Table IV (p10)
- Updated bass over winter growth figures for the Fal and Helford (Table V), and in-year growth figures for the Fal (Table VI) and the Helford (Table VII) (p 11-13)
- Summaries of catches of other species on the Fal, Helford and other estuaries in Tables VIII to X (p14-15).

Table I FAL BASS CATCH SUMMARY 2023 TL = "Total length" in centimetres. *Denotes surveys where 18m (6.5mm mesh) is used. ** Denotes where 10m net used.

Date	Site	BASS								WATER				WEATHER			GENERAL CONDITIONS
		2023		2022		2021		Other Yr Class		Temp °C	Depth (m)	Area (m ²)	Sal (‰)	Air °C	Wind	Cloud & Rain	
		No.	Ave TL	No.	Ave TL	No.	Ave TL	No.	Year								
21.5.23	Penpol	0		1	11.2	0		0		21.0	0.5	600	25	26	S F2	3/8 Nil	Very good
24.5.23	St Clement*	0		0		0		0		16.7	1.0	N/A	21	24	N F4	1/8 Nil	Fair
25.5.23	Weir	0		0		0		0		17.0	1.0	300	29	19	E F2	3/8 Nil	Good
31.5.23	Polingey**	0		0		0		0		23.0	<0.3	100	29	27	NE F1	0/8 Nil	Very good
7.6.23	Gorranorra	0		4	11.8	0		0		24.7	0.6	N/A	14	22	E F4	0/8 Nil	Good
15.6.23	Tresillian	0		0		0		0		23.0	0.6	N/K	30	26	S F3	0/8 Nil	Very good
19.6.23	Penpol	3	3.6	15	14.7	1	18.6	0		24.4	0.5	600	28	24	S F3	2/8 Nil	Good
4.8.23	Penpol	2	7.4	0		0		0		18.7	0.5	600	32	19	NW F2	8/8 Nil	Poor
9.8.23	St Clement	48	6.2	0		0		0		20.0	Var	N/A	16	21	S/SW F2	8/8 red Nil	Fair
17.8.23	Penpol	70	7.6	0		0		0		19.6	0.5	600	30	21	SE F3	8/8 Nil	Fair
22.8.23	Gorranorra*	38	7.1	0		0		0		23.9	0.6	N/A	18	20	S F2	3/8 Nil	Good
23.8.23	St Clement*	0		0		0		0		21.6	Var	N/A	25	21	S F2	2/8 Nil	Good
4.9.23	Gorranorra*	75	7.5	0		0		0		23.2	0.6	N/A	22	24	E F5	0/8 Nil	Fair
6.9.23	St Clement	2	7.3	0		0		0		23.3	Var	N/A	25	25	S/SE F1	3/8 Nil	Good
9.9.23	Polingey**	1	6.0	0		0		0		25.6	<0.3	100	35	24	F F1	2/8 Nil	Good
15.9.23	Penpol	5	8.0	0		0		0		20.6	0.5	600	30	20	S F3	4/8 Nil	Fair
16.9.23	Cowlands	43	10.3	0		0		0		19.5	0.5	540	21	20	E F3	8/8 Int	Poor
18.9.23	Gorranorra*	246	8.7	0		0		0		20.0	0.6	N/A	21	19	W F5	4/8 Nil	Fair
1.10.23	Cowlands	13	10.7	3	18.8	4	24.4	0		18.4	0.5	540	15	19.5	WSW F1	8/8 Nil	Poor
5.10.23	St Clement*	1	7.6	0		0		0		16.6	Var	N/A	23	18	SW F3	4/8 Nil	Fair

Table II HELFORD BASS CATCH SUMMARY 2023

Key: TL = "Total length" in centimetres.

Date	Site	BASS								WATER				WEATHER			GENERAL CONDITIONS
		2023		2022		2021		Other Yr Class		Temp °C	Depth (m)	Area (m ²)	Sal (‰)	Air °C	Wind	Cloud & Rain	
		No.	Ave TL	No.	Ave TL	No.	Ave TL	No.	Year								
20.5.23	Polwheveral	0		5	14.0	0		0		20.0	1	900	0	24	N F1	0/8 Nil	Very good
12.6.23	Bonallack	0		0		0		0		21.0	0.6	N/A	29	25	NW F3	3/8 Nil	Good
17.6.23	Polwheveral	201	3.7	3	15.1	0		0		22.7	1	900	5	25	SE F2	4/8 Nil	Good
16.8.23	Polwheveral	371	8.9	0		1	18.7	0		24.0	1	900	16	26	N F2	3/8 Nil	Good
21.8.23	Bonallack	38	7.9	0		0		0		19.4	0.6	N/A	30	22	S F4	8/8/ Nil	Fair
13.9.23	Polwheveral	954	9.1	0		0		0		18.0	1	900	6	19	NW F2	8/8 Nil	Fair

Table III OTHER BASS CATCH SUMMARY 2023

Key: TL = "Total length" in centimetres.

Date	Site	BASS								WATER				WEATHER			GENERAL CONDITIONS
		2023		2022		2021		Other Yr Class		Temp °C	Depth (m)	Area (m ²)	Sal (‰)	Air °C	Wind	Cloud & Rain	
		No.	Ave TL	No.	Ave TL	No.	Ave TL	No.	Year								
15.8.23	Trewornan Dam - Camel	2	3.1	0		0		0		22.6	<1	300	4	21	NW F2	4/8 Nil	Good
28.8.23	Trewornan Dam - Camel	0		0		0		0		19.2	<1	300	4	21	NW F3	7/8 Nil	Fair
8.9.23	Gannel Estuary	16	7.3	0		0		0		21.0	0.3-0.6	N/A	9	23	W F1	2/8 Nil	Good
4.10.23	Rail Bridge Pool - Camel	0		0		0		0		16.9	1	170	38	16	SW F4	8/8 Nil	Poor
6.10.23	Gannel Estuary	5	7.5	0		0		0		15.0	0.3-0.6	N/A	20	20	SW F3	1/8 Nil	Good

Table IV Catch per survey

Year	Fal			Helford			Fal			Helford			Notes
	Surveys (All)	'1' group totals	Catch per survey	Surveys (All)	'1' group totals	Catch per survey	Surveys (July-Oct)	'0' group totals	Catch per survey	Surveys (July - Oct)	'0' group totals	Catch per survey	
2023	20	23	1.2	6	8	1.3	13	547	42.08	3	1363	454.3	Only established sites on Helford. New, trial and developing sites on the Fal, with some good catches at individual sites.
2022	11	38	3.5	5	162	32.4	5	39	7.8	2	57	28.5	155 '1' groups on 19.5.22 - Helford
2021	7	576	82.3	7	361	51.6	3	1196	398.7	4	143	35.8	1159 '0' groups on 3.9.21 - Fal
2020	2	0	0.0	1	6	6.0	2	0	0.0	1	98	98.0	Covid affected survey programme
2019	5	19	3.8	4	39	9.8	3	1578	526.0	1	803	803.0	1481 '0' groups on 12.8.19 - Fal
2018	7	920	131.4	6	89	14.8	4	47	11.8	4	99	24.8	847 '1' groups on 10.6.18 - Fal
2017	6	215	35.8	5	2928	585.6	2	207	103.5	2	764	382.0	2820 '1' groups on 11.6.17 - Helford
2016	6	55	9.2	5	51	10.2	3	872	290.7	2	2639	1319.5	Reasonable class on Fal. 2578 '0' groups on 3.8.16 - Helford.
2015	7	545	77.9	5	13	2.6	5	228	45.6	4	479	119.8	446 '1' groups on 28.6.15 - Fal
2014	6	109	18.2	6	230	38.3	5	3107	621.4	5	783	156.6	1666 '0' groups 7.8.14 - Fal
2013	10	104	10.4	6	406	67.7	7	521	74.4	5	536	107.2	Polwheveral surveyed 11th Nov - nil found
2012	7	346	49.4	7	87	12.4	4	157	39.3	4	648	162.0	528 '0' groups on 30.9.12 - Helford
2011	9	94	10.4	9	5	0.6	7	558	79.7	5	133	26.6	
2010	8	619	77.4	12	101	8.4	4	88	22.0	8	73	9.1	
2009	7	349	49.9	4	221	55.3	4	35	8.8	2	27	13.5	
2008	5	2074	414.8	4	499	124.8	4	6	1.5	3	39	13.0	Est 2000 '1' groups on 14.6.08 - Fal
2007	11	7	0.6	5	17	3.4	10	565	56.5	4	550	137.5	
2006	13	62	4.8	6	149	24.8	8	17	2.1	4	68	17.0	
2005	8	3	0.4	8	11	1.4	4	1	0.3	4	92	23.0	Inconclusive class on Helford.
2004	11	7	0.6	7	59	8.4	4	89	22.3	4	32	8.0	
2003	7	274	39.1	2	2621	1310.5	6	320	53.3	0	0		~2,500 '1' groups on 12.6.03 - Helford
2002	14	12	0.9	4	8	2.0	11	551	50.1	3	152	50.7	
2001	14	110	7.9	4	74	18.5	10	14	1.4	3	3	1.0	
2000	4	35	8.8	6	97	16.2	3	3	1.0	4	48	12.0	Limited netting.
No Fal surveys prior to 2000. 1996-1999 Helford surveys not included.													
Year class conclusions (from annual reports):													
Inconclusive													
Poor													
Fair/Reasonable													
Good													
Very good													
Cefas Solent survey													
"2010 - 2012 weak. 2013 & 14 above geometric mean. 2015 & 2017 relatively weak. 2018 shows some evidence of improvement."													

Table V BASS GROWTH over winter - FAL & HELFORD

Year	First Ave length of '1' group (Fal)	Last length Ave of '0'group (Fal)*	First Ave length of '1' group (Helford)	Last Ave length of '0'group (Helford) *	Notes Lengths in cm. NB Forked length used until 2018; Total Length from 2019 onwards (TL = FL 1.07) * Where two cohorts found, longest used
2023	11.2 (21/5)	10.7 (1/10)	14.0 (20/5)	9.1 (13/9)	Good growth on the Helford.
2022	12.5 (16/5)	9.8 (29/8)	12.2 (19/5)	10.4 (26/8)	
2021	10.8 (24/6)	8.9 (6/9)	10.3 (11/5)	10.1 (7/9)	
2020	-	-	-	-	Covid affected survey programme
2019	10.9 (31/5)	8.0 (20/8)	14.0 (19/6)	7.3 (1/8)	
2018	10.9 (20/5)	11.6 (30/9)	11.6 (28/5)	11.0 (12/9)	
2017	8.3 (7/5)	6.3 (19/8)	10.9 (27/4)	7.9 (23/8)	
2016	7.7 (18/5)	7.8 (16/9)	8.6 (8/5)	6.9 (31/8)	
2015	10.4 (21/6)	6.3 (29/9)	11.9 (1/7)	5.6 (12/9)	
2014	9.9 (24/6)	8.1 (12/10)	10.0 (12/6)	10.8 (26/9)	
2013	7.9 (7/6)	4.2 (15/10)	8.4 (21/6)	6.3 (21/9)	
2012	9.4 (19/5)	6.5 (6/10)	10.6 (3/6)	6.6 (30/9)	
2011	10.0 (30/5)	6.1 (8/9)	10.8 (21/6)	6.7 (15/9)	
2010	10.0 (9/6)	7.5 (27/9)	10.3 (13/5)	7.4 (22/9)	
2009	8.3 (5/6)	8.5 (8/10)	10.0 (20/6)	3.7 (12/8), 4.7 (5/8)	
2008	9.8 (14/6)	3.2 (1/8)	11.3 (17/6)	5.4 (15/8)	
2007	14.9 (13/9)	7.4 (13/10)	12.6 (12/6)	5.0 (30/8)	
2006	11.2 (16/5)	9.0 (5/9)	12.0 (31/5)	6.1 (15/8)	
2005	9.2 (19/9)	-	10.1 (4/6)	6.6 (17/8)	
2004	12.8 (1/7)	8.8 (2/10)	N/A	N/A	
2003	11.1 (7/7)	9.0 (23/9)	10.5 (12/6)	-	
2002	10.6 (31/5)	6.3 (30/8)	N/A	N/A	

Table VI BASS GROWTH in year - FAL

Year	First Ave length of '1' group	Last Ave length of '1' group	First Ave length of '0' group	Last Ave length of '0'group *	Notes Lengths in cm. NB Forked length used until 2018; Total Length from 2019 onwards (TL = FL 1.07) * Where two cohorts found, longest used
2023	11.2 (21/5)	18.8 (1/10)	3.6 (19/6)	10.7 (1/10)	Good growth for '1' and '0' groups.
2022	12.5 (16/5)	17.2 (12/8)	8.0 (12/8)	9.8 (29/8)	
2021	10.8 (24/6)	18.5 (6/9)	8.0 (15/6)	8.9 (6/9)	
2020	-	-	-	-	No fish found. Only 2 surveys due to Covid.
2019	10.9 (31/5)	11.6 (12/8)		8.0 (20/8)	A reading of 14.8 was obtained on 5/8 at Ruan
2018	10.9 (20/5)	16.2 (18/8)	8.2 (18/8)	11.6 (30/9)	
2017	8.3 (7/5)	14.5 (12/8)	6.3 (12/8)	6.3 (19/8)	
2016	7.7 (18/5)	13.4 (25/8)	5.5 (18/8)	7.8 (16/9)	
2015	10.4 (21/6)	12.0 (19/9)	4.3 (11/8)	6.3 (29/9)	
2014	9.9 (24/6)	17.0 (3/9)	5.5 (3/8)	8.1 (12/10)	
2013	7.9 (7/6)	13.9 (14/8)	4.5 (25/7)	4.2 (15/10)	An '0' group reading of 7.1 was obtained 15/9 at GG
2012	9.4 (19/5)	13.6 (28/8)	5.6 (23/8)	6.5 (6/10)	
2011	10.0 (30/5)	14.7 (3/9)	5.0 (21/8)	6.1 (8/9)	
2010	10.0 (9/6)	18.7 (5/9)	4.5 (7/8)	7.5 (27/9)	
2009	8.3 (5/6)	14.7 (8/10)	4.1 (30/7)	8.5 (8/10)	
2008	9.8 (14/6)	11.8 (1/8)	3.2 (1/8)	3.2 (1/8)	
2007	14.9 (13/9)	14.9 (13/9)	5.0 (7/8)	7.4 (13/10)	
2006	11.2 (16/5)	15.2 (28/7)	7.8 (29/8)	9.0 (5/9)	
2005	15.0 (30/8)	18.7 (5/10)	9.2 (19/9)	9.2 (19/9)	
2004	12.8 (1/7)	19.3 (2/10)	5.4 (7/8)	8.8 (2/10)	
2003	11.1 (7/7)	11.1 (11/7)	3.3 (18/7)	9.0 (23/9)	
2002	10.6 (31/5)	14.0 (3/8)	3.6 (3/8)	6.3 (30/8)	
2001	9.6 (18/6)	16.2 (7/9)	5.5 (14/8)	5.5 (14/8)	
2000	10.6 (6/6)	15.7 (29/8)	3.6 (11/8)	3.6 (11/8)	This was the first year of surveys on the Fal

Table VII BASS GROWTH in year - HELFORD

Year	First Ave length of '1' group	Last Ave length of '1' group	First Ave length of '0' group *	Last Ave length of '0'group *	Notes Lengths in cm. NB Forked length used until 2018; Total Length from 2019 onwards (TL = FL 1.07) * Where two cohorts found, longest used
2023	14.0 (20/5)	15.1 (17/6)	3.7 (17/6)	9.1 (13/9)	Good growth for '0' groups (? '1' gps).
2022	12.2 (19/5)	13.9 (16/6)	7.6 (28/7)	10.4 (26/8)	
2021	10.3 (11/5)	13.6 (25/8)	6.4 (9/8)	10.1 (7/9)	
2020	14.4 (4/8)	14.4 (4/8)	5.2 (4/8)	5.2 (4/8)	Only 1 survey due to Covid.
2019	14.0 (19/6)	14.0 (19/6)	7.3 (1/8)	7.3 (1/8)	A small cohort (5) of '0' groups at 4.2 on 1/8
2018	11.6 (28/5)	15.0 (12/8)	8.8 (12/8)	11.0 (12/9)	
2017	10.9 (27/4)	15.4 (23/8)	6.8 (6/8)	7.9 (23/8)	
2016	8.6 (8/5)	14.5 (31/8)	3.0 (4/7)	6.9 (31/8)	
2015	11.9 (1/7)	17.4 (12/9)	5.3 (2/8)	5.6 (12/9)	
2014	10.0 (12/6)	13.8 (26/7)	5.3 (26/7)	10.8 (26/9)	
2013	8.4 (21/6)	15.2 (6/9)	6.1 (20/8)	6.3 (21/9)	
2012	10.6 (3/6)	17.4 (15/9)	3.8 (1/8)	6.6 (30/9)	
2011	10.8 (21/6)	15.4 (12/8)	5.8 (12/8)	6.7 (15/9)	
2010	10.3 (13/5)	12.4 (12/8)	<3.0 (2/7)	7.4 (22/9)	A '1' group reading of 13.6 on 2/7 at Bonallack
2009	10.0 (20/6)	11.5 (5/8)	4.7 (5/8)	3.7 (12/8),	
2008	11.3 (17/6)	14.3 (15/8)	3.7 (16/7)	5.4 (15/8)	
2007	12.6 (12/6)	16.5 (10/8)	4.0 (19/7)	5.0 (30/8)	
2006	12.0 (31/5)	18.5 (13/9)	5.0 (31/7)	6.1 (15/8)	
2005	10.1 (4/6)	15.0 (17/)	3.7 (13/7)	6.6 (17/8)	
2004	12.6 (15/6)	16.0 (5/9)	6.2 (13/8)	6.2 (13/8)	
2003	10.5 (12/6)	10.9 (23/6)	-	-	
2002	11.1 (18/6)	14.3 (22/7)	3.5 (29/7)	8.1 (23/9)	
2001	10.1 (21/5)	16.2 (23/8)	5.0 (2/8)	7.6 (29/10)	
2000	11.4 (15/5)	15.7 (7/8)	4.5 (7/8)	4.5 (7/8)	Data from 1996- 1999 Helford surveys not included

Table VIII Summary of other species caught 2023 - FAL (numbers are approximate)

Site & date	Mullet		Flounders		Gobies (common)	Sand smelt	Others
	< 10cm	> 10cm	< 5cm	> 5 cm			
Penpol 21.5.23	1,000	0	0	0	50	100	
St Clement 24.5.23	25		0	1	Occ.	50	Occ. shore crabs and prawns. 1x pilchard. 1 x herring.
Weir 25.5.23	0	0	0	0	50	600	Occ. prawns and shrimps. Occ. juv. pollack and herring.
Polingey 31.5.23	200	1	0	0	0	0	50 small shrimp/prawns
Gorranngorras 7.6.23	200		0	0	20	100	A few shore crabs. 10 gilt head bream.
Tresillian 15.6.23	A few		0	0	Occ.	Occ.	1 x pilchard
Penpol 19.6.23	100		3	1	50	25	25 shore crabs
Penpol 4.8.23	100		0	0	0	200	10 shore crabs
St Clement 9.8.23	7		0	0	Occ.	500	5,000 sprats. 1 x lesser pipefish. 1 x herring. 25 shore crabs. Juv. sprat/herring. Occ. sand goby.
Penpol 17.8.23	1,000	6+	0	0	0	3+	Occ. shore crab.
Gorranngorras 22.8.23	1,000	0	0	0	0	A few	1 gilt head bream.
St Clement 23.8.23	200	0	0	0	A few	200	Occ. herring. 1 pipefish.
Gorranngorras 4.9.23	2,000	5+	0	0	0	0	
St Clement 6.9.23	50	0	0	0	0	100	25 scad. 10 herring. 100 sprats. 2 pipefish. A few shore crabs. +++ mysids. 1 pouting.
Polingey 9.9.23	2,000	4+	0	0	A few.	0	50 shrimp/prawns. A few shore crabs.
Penpol 15.9.23	50	2+			10		20 shrimps. 20 small shore crabs.
Cowlands 16.9.23	500				Occ.	Occ.	5 gilt head bream
Gorranngorras 18.9.23	500	4+					
Cowlands 1.10.23	200	5+				100	
St Clement 5.10.23	200				Occ.	10+	Occ. sprat. Occ. scad. Occ. herring. Occ. pilchard.

Table IX Summary of other species caught 2023 - HELFORD (numbers are approximate)

Site & date	Mullet		Flounders		Gobies (common)	Sand smelt	Others
	< 10cm	> 10cm	< 5cm	> 5 cm			
Polwheveral 20.5.23	200					50	
Bonallack 12.6.23		1			Occ.	200	A few pilchards & sprats. Some shore crabs. +++mysids. Occ. herring. Some larger mullet seen jumping the net.
Polwheveral 17.6.23	500				25		50 gilt head bream. Mysids +++
Polwheveral 16.8.23	2,000					2,000	50 gilt head bream. Mullet mostly small.
Bonallack 21.8.23	50	3+			A few		2 gilt head bream. A few herring and occ. sprat. 4 pipefish. 1 scad. Some 'translucent' fish ~4cm.
Polwheveral 13.9.23	2,000	1+			Occ.		2 gilt head bream.

Table X Summary of other species caught 2023 - CAMEL & GANNEL (numbers approximate)

Site & date	Mullet		Flounders		Gobies (common)	Sand smelt	Others
	< 10cm	> 10cm	< 5cm	> 5 cm			
Trewornan Dam - Camel 15.8.23	Occ.			1	50		200 shore crabs.
Trewornan Dam - Camel 28.8.23	500	15*			50		2 sticklebacks. *~50cm.
Gannel Estuary 8.8.23	500	3+			A few		Occ. sand goby. Occ. lesser sandeel. 1 plaice.
Rail Bridge Pool - Camel 4.10.23	2,000	8+					+++ prawns
Gannel Estuary 6.10.23	200				Occ.	200	25 lesser sandeel.

4. DISCUSSION and CONCLUSIONS

Bass catches - '0' and '1' groups

Catches of '0' groups last year were low, and our initial conclusion was that the 2022 year class was a poor one. Catches of '1' groups this year have been consistently low/absent. Overall Catch Per Survey (CPS) figures for '1' groups of 1.2 for the Fal and 1.3 for the Helford this year are very low, and are consistent with low CPS figures for '0' groups of 7.8 and 28.5 for 2022 in the Fal and Helford respectively. In light of these results, and the fact that first-winter losses are likely to have been low, we feel confident in confirming this assessment that the **2022 year class was a poor one** in our survey area.

We first encountered '0' groups in mid-June, the earliest we've ever seen them. Good numbers were found on the Helford from August, the largest catch being 954 on 13th September at Polwheveral. This is the second highest catch at this site in 24 years.

Catches of '0' groups on the Fal were mixed, but it must be borne in mind that, unlike on the Helford, we were unable to survey either of the long-standing sites (Lamorran and Ruan) which require a boat to access. Nevertheless, some good catches were made, the best being 246 on 18th September at Gorrangorras.

A CPS figure for '0' groups of 454 is the third highest we have seen since 2000 for the Helford. The CPS figure for '0' groups for the Fal is 42. This is clearly much lower than the Helford. The total catch of '0' groups on the Helford between July and October (1,363) came from just 3 surveys. The total on the Fal (547) came from 13 surveys. However, these were all either new or recently acquired sites, or old sites which had been previously discounted. We are still establishing the seasonality (i.e. the months when '0' groups are most prevalent) and optimum netting method and timing for these sites, and the optimum productivity which can be expected in a good year. St Clement, for example, gave a good result of 48 on 9th August, but the next three surveys gave just 3 '0' groups; it is unclear whether this reflects the movement of '0' groups within that section of the estuary, or other factors. Sites such as Penpol and Gorrangorras are becoming established, but we still need to determine what is a good catch for these. If, as we suspect, 2023 is a good year class in this area, catches of 70 at Penpol (17th August) and 246 at Gorrangorras (18th September) may represent the optimum productivity and seasonality for these sites. Whereas Polingey continues to be an enigma, with only 1 juvenile bass from two surveys, Cowlands Creek looks like being a useful site, with a good catch of 43 on the first survey (16th September) since it was tried (and discounted) during the early days of the surveys.

Our results allow us to conclude that **the 2023 year class is a good one on the Helford**. Although less clear, there are enough good results to suggest that **this is the same on the Fal**. Confirmation of these predictions will hopefully come from our '1' group surveys next year. Whether this results in a good year class recruiting to the adult fishery depends on survival and predation during its early years within the estuary system (and elsewhere).

Results on the Camel continue to be poor (3 surveys). The sites chosen were established by Donovan Kelley, yet success continues to elude us. It may be that we have just been unlucky with conditions, and needing to establish the optimum netting method and timing, so we will continue our efforts for another year. We have had some success on the Gannel, with a catch of 16 at the first attempt (8th September), and it is hoped that this site will give us an

indication of spawning and settlement success on the north side of the Cornwall peninsula in the future. However, we do not yet have the confidence in either the Camel or Gannel results to make an assessment of this at this stage.

Bass catches - other areas and year classes

Catch information gained from other sources can be useful in identifying potential differences in spawning/settlement success in other areas. It can also be useful in supporting (or otherwise) our year class assessments as the fish move through the juvenile phase and recruit to the adult fishery.

- Clive Hodges reports plenty of 0 & 1 groups in Poole Harbour in August.
- Good numbers of '1' (?) groups reported in April in the Teign (S. Devon) area. Tommy Brice reports large numbers of '1' (?) groups in June in his local river on the Isle of Wight. Suggests a better 2022 class than we saw in Cornwall.
- Large numbers of 15-20cm bass on the open coast and in the Fal by Tim Howe in June (?). Probably two-year-olds, supporting our fair/reasonable assessment of the 2021 class.
- Lee Pepper reports lots of 25-30cm bass in Cornwall in June. Likely 3-year-olds. Our assessment for the 2020 class was inconclusive due to sampling being heavily impacted by Covid.
- Tony Welch reports large numbers of 30cm bass in the Fal in June ?3-4-year-olds i.e. 2019/20
- Malcolm Gilbert reported large numbers of ~30cm fish in Mounts Bay in May. Presumably these fish have left the nursery habitat for the first time. Andrew Pascoe notes there being lots of 30cm+ bass about this year. These are likely to be 4 year olds, thereby confirming our 'good' assessment of the 2019 class.

Bass growth

Table V (p11) gives a rough indication of growth over the winter, by comparing the last average length of '0' groups found in one year, with the first average length of '1' groups the following year. Growth appears to have been good on the Helford, less so for the Fal. However, it must be borne in mind that both '0' group lengths were from late August, and they may have grown more after this. Also, only small numbers of '1' groups were found at the beginning of the survey period this year.

Tables VI & VII (p12 & 13) give a rough indication of in-year growth on the Fal and Helford, by comparing the first and last average lengths of '1' groups and '0' groups found. On the Fal, growth appeared good for both '1' groups, going from 11.2 → 18.8cm (1/10) and '0' groups, going from 3.6 → 10.7cm (1/10). Growth of '1' groups on the Helford was difficult to assess, since we only have lengths to 17th June, but growth of '0' groups was good going from 3.7 → 9.1 (13/9).

It was interesting to note the presence of a range of ‘0’ group sizes in mid-September (18/9) at Gorrangorras on the Fal, including some that were small for the time of year, possibly indicating a later (? May/June) spawning cohort. Dave Taylor notes “We were catching roed up bass through April and into May, even in June the males we were catching could be described as "very excitable " upon landing!!!”

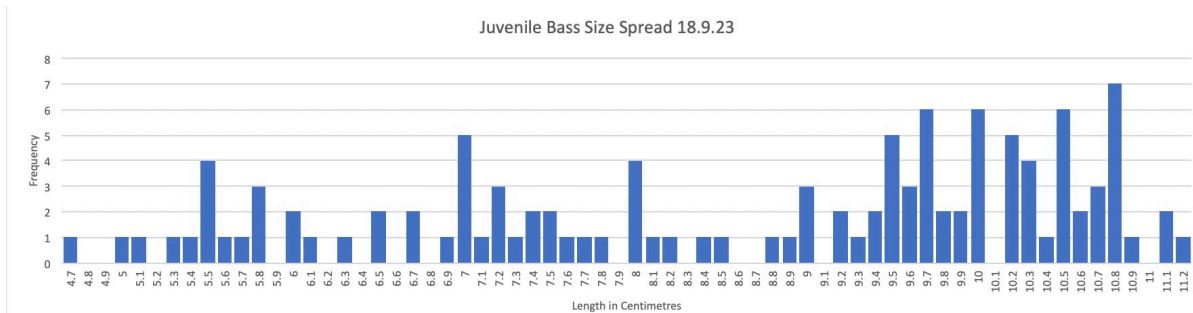


Chart: Danny Bowering



‘0’ groups in September showing marked variation in size. Photo credit: Robin Bradley.

Catches of other species

Small mullet (~5cm) were numerous on many surveys, numbers sometimes running into the thousands. We assume this means that 2023 is also a good year for mullet spawning and settlement.

Common gobies (*Pomatoschistus microps*) were seen in reasonable numbers at some sites in May and June, but not many after this.

Sand smelt (*Atherina presbyter*) were seen in good numbers, although this was patchy. The highest number was approximately 2,000, at Polwheveral on 16th August.

Gilt-head bream (*Sparus aurata*) were seen on 3 of the 20 surveys on the Fal (Gorranhorras x 2 and Cowlands), and 4 of the 6 surveys on the Helford. Peak numbers (50) were seen on the two Helford surveys in June (mostly 5.1 - 5.9cm) and August (8.0 - 11.9cm).



Gilt-head bream at Bonallack on 21st August. Photo credit: Ben Harris.

Other species included mysids (plentiful at times), shore crabs, pilchards, herrings, prawns/shrimps, sprats (including one very large catch at St Clement on 9th August), pipefish, pollack, sand goby, pouting, scad, lesser sandeels, plaice. At Trewornan Dam (28th August) we found two sticklebacks; the River Amble passes through this site.

Data collected during the course of our surveys provides interesting insights about species diversity at different sites, and potentially the appearance/disappearance of species over the years. This information is freely available on our website in the annual reports section.

Weather 2022/2023

Daily air temperatures, and wind direction and strength (Culdrose) were obtained from timeanddate.com. Daily Sea Surface Temperatures (Falmouth) were obtained from seatemperature.org. Continuous water temperature readings were obtained from Cornwall IFCA temperature loggers in three locations in the Fal (upper Carrick Roads). Daily water temperatures from mid-March to mid-June 2023 were obtained from two F-PODs on the Fal (King Harry Ferry and Carricknath Point), both supplied by Chelonia Ltd, the Carricknath one loaned to Falmouth Marine Conservation. As yet we have no water temperature data for the Helford, other than ad hoc measurements made over the winter and during surveys (also on the Fal).

(a) '0' group survival. There was a cold spell in December, with early morning air temperatures reaching 0°C on the 7th, but by the 18th these had recovered to 8°C. The lowest that water temperatures went during this time was 8.9°C, except for one manual reading at Porth Creek on the Percuil of 6.6°C on the 17th.

Donovan Kelley thought that prolonged periods (>4weeks?) of very cold weather killed '0' group bass in their first winter if they had not reached 6cm by the autumn. In terms of lethal water temperatures, the only reference I can find is "The influence of a power station on the survival of juvenile sea bass in an estuarine nursery area" (J Fish Biol. 1999 54, 1143-1160 Pawson and Eaton), suggesting that water temperatures of 6-7°C kill first year bass. The lowest temperature recorded on the Fal was 7.3°C on 16th February, but by 19th February this has recovered to 8.2°C. It is therefore unlikely that significant numbers of 2022 '0' groups would have been lost to cold weather, particularly since most of them would have grown to more than 6cm by the autumn. These temperatures are from the main estuary water body, and I am assuming that the '0' groups would have moved there from our netting sites as the air and water temperatures fell.

We can only assume a similar situation prevails in the Helford. On three occasions when the water temperature was manually checked at Durgan between 26th January and 23rd February it varied between 10.0 and 10.4.

A manually-recorded water temperature at the Polwheveral site was 7.2°C on 3rd March, and 9.5°C at the Lamorran site on the Fal on the 4th March. It would be interesting to know at what temperatures '0' groups start to move from sampling sites in the autumn, and when they start to move back to the sites as '1' groups the following spring. A programme of sampling and temperature measurements over the whole year could potentially determine this, but this is beyond the scope of our group's efforts.

(b) Spawning and settlement. A good spawning year is thought to be associated with relatively strong and homogeneous westerlies, whereas in poor spawning years, average winds are more variable, with no particularly clear directionality or strength. Settlement in the northern stock is highly correlated with temperature, with poor settlement in cold years*.

Between the beginning of February and the end of May, when spawning is likely to be taking place and larvae/post larvae drifting towards the coast, winds were mostly light to moderate, with no particular trend in direction (Culdrose weather station). Days when winds had a westerly component accounted for 47 of the 120 days.

Air temperature data (Culdrose weather station) during the same period shows that average monthly temperatures were slightly above the mean for Feb to May, and significantly so for June (17°C compared to a mean of 14°C). There was a warm settled spell from mid-May until late June, in fact June 2023 was the hottest on record, with very little rain since mid-May.

There was an extreme marine heatwave off the British coast, with water temperatures 4-5 °C higher than normal, leading to concerns about algal blooms, seagrass, seaweeds and plankton. Temperatures in the Fal were ~ 3°C higher than normal.

The wind direction and strength would not appear to have particularly favoured good settlement. On the other hand, the only prolonged (17 days) spell of winds with an easterly component (which may potentially impede the progress of larvae) came in late May/early June, by when larvae/post larvae from a Feb/March spawning would probably have reached estuaries.

Temperature, on the other hand, probably had a significant effect on settlement success, both in terms of the good numbers of '0' groups found, and their early arrival.

A cool, wet July does not seem to have slowed growth unduly.

* The influence of oceanographic conditions and larval behaviour on settlement success—the European sea bass *Dicentrarchus labrax* (L.) ICES Journal of Marine Science (2017).

(c) Survey conditions

The warm and settled weather in May and June provided good conditions for most surveys. Conditions were less settled in August and September, but were good or fair for most surveys.

Salinity

This was the first year that Salinity was measured routinely. The ATAGO S/Mill-E refractometer was easy to use, robust, and gave fairly consistent results for each site. At Polwheveral on 13.9.23, when we had our best catch of the year (954 '0' groups), a reading of 6 parts per thousand (ppt) was obtained from the shallow water just behind the advancing tide near the head of the inlet we net. This reading is not unusual for this site. A higher reading was obtained by Dr Ciotti, using equipment from Plymouth University, in deeper water at the mouth of the inlet. This prompted a repeat measurement using the ATAGO, which confirmed the initial reading, but gave 35ppt for water drawn from about 0.5m below the surface. This was similar to Dr Ciotti's reading, taken from the same depth.

“Post-larval stages tend to use upper reaches of estuaries of relatively low salinity, with larger 0-group fish then using areas of intermediate salinities, before fish of ≥ 1 year using a wider range of habitats across the estuary (Figure 3.9; Roy *et al.*, 2022)”. (from “Review and synthesis of current evidence on the biology, ecology and fisheries for sea bass and assessment of evidence gaps” - Bournemouth University).

It would be unwise to attempt to draw any firm conclusions from this first year of data. We will continue to routinely measure salinity, and observe trends in future to see if sites with lower salinity are more productive, or if sites are more productive when salinity is lower.

5. FUTURE ACTIONS

A request for permission to use a Fyke net for a trial on the Tresillian river has been submitted to the Environment Agency. If this is successful, and the necessary equipment (Fyke net + otter boards) can be loaned, we will undertake this next year.

We hope to assimilate training and information regarding fish identification and the conduct of fish surveys, provided by the Institute of Fisheries Management in 2024 as part of the 'FinVision' FISP project which we are helping with. We will help with the compilation of a list of fish surveys around the Country, should this be included in this project.

6. OTHER OBSERVATIONS

Bass cannibalism

Marcus Hazeldine, a fishing guide in Chichester Harbour, reports seeing adult bass with juvenile bass in their throats on more than 10 occasions this year. The photo below shows a 52cm bass with what appears to be an '0' group bass in its throat.



Photo credit: Marcus Hazeldine

7. ACKNOWLEDGEMENT 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 could not take place. Those who have participated in surveys this year include: Ian Ingram, Rob Hillman and his son Isaac, Gav

Ingram, Simon Willey, Bradley Wiffen, Jason Collins, John Shipwright, Ben Harris, Rob Taylor, Nigel Burley, Craig Baldwin, George Brew, Brian Collick, David Wilson, Ron Davey, Eddie Gummow, Dave Jones.

Angela Bradley for her sterling work repairing net tears.

James Menhennick, who farms the land at Trewornan Dam, for giving us permission to drive across his fields (and showing us how to reach the site). Without this, the job of carrying the heavy net box and other equipment down to the dam would make surveys untenable.

David Kelley for his help and insights regarding identifying survey sites on the Camel which his father Donovan used.

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 for their support, in particular to Mark Killingback.

Patrick Polglase and Sharon Bowden at the Duchy of Cornwall for permission to net their fishery in the Helford.

Sarah Slade, for allowing us to park by Polwheveral Mill.

James Lyall, for permission to access the land leading to the Bonallack site, allowing us to net this site without a boat. Thanks also to Kevin Pinch, who has kindly transported the net box and other equipment down to the creek.

Peter Maddern for preparing the Cornwall Bass Investigations Group logo and website.

Colin Trundle, CIFCA and Joe Dennett, Chelonia Ltd., for temperature data.

Those who supplied catch comments (see under Bass catches - other areas and year classes + bass growth section - p17 & 18).

Sue Scott for providing the Fal & Helford SAC map.

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Guidelines for beach-seine surveys of 0-gp and 1-gp bass (*Dicentrarchus labrax*) in UK nursery grounds. Cefas.

The influence of a power station on the survival of juvenile sea bass in an estuarine nursery area” (J Fish Biol. 1999 54, 1143-1160 Pawson and Eaton).

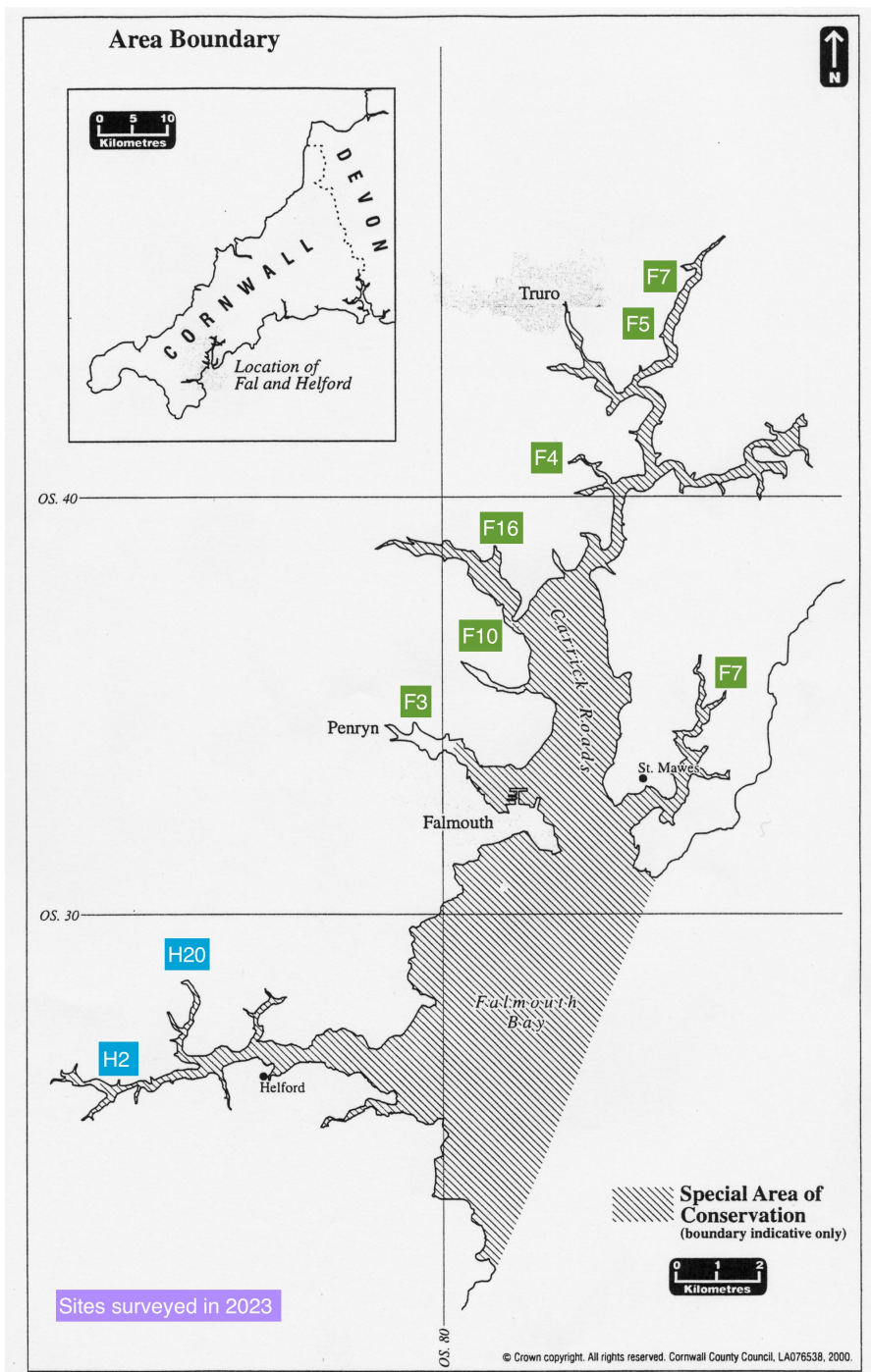
The influence of oceanographic conditions and larval behaviour on settlement success—the European sea bass *Dicentrarchus labrax* (L.) ICES Journal of Marine Science (2017).

Review and synthesis of current evidence on the biology, ecology and fisheries for sea bass and assessment of evidence gaps” - Bournemouth University).

8. APPENDICES

SITES

It is helpful to appreciate the spatial distribution of sites within estuary systems, since this may have a bearing on the potential of sites to produce juvenile bass at different stages of development and times of year. The sites we were able to survey this year are shown in the map below, with descriptions of each in the pages that follow. For continuity, the numbering system used in the early annual reports has been maintained. H = Helford, F = Fal.



Sites netted on the Helford 2023.

H20 Head of Polwheveral Creek. Grid reference SW 739 284.

This site is the best site found so far in the Helford complex for catching small fish. It is accessed by road, and no boat is needed. Polwheveral Creek is a major creek of the Helford, and the site is in a salt marsh inlet separated from the main stream at the head of the Creek. The stream cannot be netted due to mooring blocks and fallen trees. The water temperature in the stream is usually two degrees C cooler than the inlet. Netting in the inlet is done about one hour before high water, and on a tide of at least 4.8 metres at high water Falmouth. Any lower tide may not flood the site, especially in anticyclonic conditions and the barometric pressure is high. A late afternoon tide is ideal and on a 5.0m high water. The site fundus is mud but negotiable. To avoid struggling in mud across the entrance of the inlet a line can be walked up to it on both sides of the salt marsh and the net can then be hauled across it when the tide is in, just before it floods the salt marsh. The net is then hauled up through the inlet once. Care must be taken to keep the foot rope of the net close to the vertical edge of the salt marsh and on the bottom when the net is hauled on to the salt marsh to avoid losing fish. The great bulk of the catch is in the bunt of the net and retained in the water and sorted, putting sufficient fish for measuring and any for identifying in buckets. The rest of the bass are counted and returned unharmed.

H2 Bonallack – main channel. Grid reference SW 718 260.

A boat was previously needed to reach this site, but permission was obtained from the landowner to access the site via the Bonallack Estate, meaning this is no longer necessary. A farm lane on the north bank leads down to the site. The mud is negotiable but difficult, and the decision was taken to net just below the farm lane, near the remains of an old stone path, rather than further (100m) along to the right as in previous surveys, due to concerns about the mud here. The south side is a wide mud flat that is also difficult to negotiate. The river bed is firm shingle, mud, and sand, but mostly free of snags. There is a need to find the best place to run and hold the net across the river, while at the same time avoiding the worst of the mud. The productive length and where it can be most easily worked is about 300m long.

Netting is best done on a falling tide with low water late in the afternoon and with a height of about 1.0 - 1.3m. It is best to arrive at the site at least 2 hours before low water. Working from the north bank, the net is run across the river starting at around 1 hour 45 mins before Low Water (tide too strong before this). It is held against the tide for ten minutes, and then hauled ashore to the north bank. Netting is repeated until the water is too shallow and no more bass are being caught (about 45 mins before Low Water).



The main channel at Bonallack. Photo credit: Robin Bradley.

Sites netted on the Fal 2023.

F16 Penpol Creek. Grid reference SW 812 388.

The site is at the head of this small creek which branches off the larger Restronguet Creek, which in turn runs into the Carrick Roads.

Further surveys this year have confirmed its value as an '0' group site. The 30 x 2m net is drawn across the corner above the causeway at the head of the creek using the long rope, then hauled to shore. HW -2 to -1.5 seems to be the best time to haul the net. Tide probably best when > 5.0m. Early in the summer green weed can be prevalent.

It should be noted that intertidal sediments in this part of the Fal are thought to contain significant amounts of zinc, copper, tin, lead and arsenic arising from waste from the tin and copper mining industry, which was active until the early twentieth century in this area.

F7 Polingey Creek. Grid reference SW 866 351.

About 140m below the normal tidal limit of this creek there is what appears to be the remains of a stone causeway across the creek, which is about 60m wide at this point. This is in fact the remains of a tidal mill. In the middle of the 'causeway' is a mound of material, with deeper water either side. The creek itself is wide and muddy, and most importantly not shaded by trees, so that it benefits from being warmed all day by the sun (taken from 2002 Annual Report (Fal)).

The remains of a pool on the N side are still just visible at low water, but there is insufficient depth for netting there now. On the S side of the creek, a pool (~100 sq. m) is revealed by the falling tide about 2 hours into the ebb.

The site was netted by drawing the 10 x 2m net through the pool on the S side once, from two hours after HW.

A catch of > 500 '0' groups was made here on 15.8.2002, netting the pool on the N side, indicating that this could be a useful site. Poor results in 2023, which appears to have been a good year class, suggests that this may no longer be the case.

F3 Gorrangorras Creek (Penryn River). Grid reference SW 793 345.

The entrance of the creek is rock and mud on the W shore and a bar of sand and shingle extends from E shore. Between these, the flooding channel is netted about two hours after LW, by holding the net across the incoming tide for 10 minutes, before bringing the far end to the W bank. This has proved to be a reliable site during 2023.



Gorrangorras Creek. Ian Ingram (L) and Bradley Wiffen. Photo credit: Robin Bradley

F4 Head of Cowlands Creek. Grid reference SW 830 408.

Two small streams enter this tree-lined creek at its head. A worker on the N side pulls the 30m net across from the south side, using a long (~70m) rope, until the trailing end of the net

is level with the first grassy point, and the net is about 30m out. Then both ends are drawn to the grassy bank in the middle of the creek. Initial results have been encouraging, and suggest that 2 hours before HW on a spring tide is best.



Cowlands Creek. Photo credit: Robin Bradley.

F5 St Clement. Grid reference SW 852 440.

A small stone causeway, and the area to the side of it, allows access across the soft mud to net this site at the lower reaches of the Tresillian river. Netting is done on a falling medium tide from about 2 hours before LW, by holding the net against the tide, as far out in the channel as possible, for 10 minutes. The flood tide has not been tried yet.

This site does produce '0' groups (48 on 9.8.23), but results are inconsistent. Perhaps this is a feature of this type of open site, where the fish are passing through?



The channel at St Clement. L to R Rob Hillman, Jason Collins, Robin Bradley. Photo credit: Isaac Hillman.

F10 Weir beach. Grid reference SW 817 368.

This site was tried again following some Environment Agency (EA) survey data, which indicated that 2-year-old bass had been found here in the Autumn. We wondered if it might be possible to get '1' groups in the spring/summer, but in the event, we were unsuccessful. This may have been because there were few '1' groups about generally. One end of the 30m net was drawn out from the shore as far as possible (~20m) on the late ebb, then walked along for about 50m, before bringing the far end to the shore. It may be worth holding the net against the tide when it is running (e.g. 2 hours before Low Water), but a neap tide would be necessary here as the current can be strong.

As with St Clement, this is an open site, and depends on the chance of netting a passing shoal. It would probably be better to focus efforts on more productive sites.



Weir beach. Simon Willey (L) and Gav Ingram. Photo credit: Robin Bradley.

F7 Tresillian. Grid reference SW 859 452.

EA surveys found juvenile bass in the mid-section of the Tresillian river, so this site near Pencalenick School was chosen as it had easy access, and was close to the main channel. Several hauls of the net were made by the old scout hut on the last hour of the flood, but no bass were found. It would probably be better to focus efforts on more productive sites.



Tresillian. Photo credit Robin Bradley.

Sites netted on the North Coast 2023.

Year class strength can vary between the north and south sides of the Cornwall peninsula, depending on wind direction at the time the larvae are drifting towards the coast. To try to obtain an assessment of year class strength on the north side, we have carried out a limited number of surveys (3) on the Camel and the Gannel (2) this year. We are still developing our approach to these sites, so no conclusions can be drawn from this year's results.

Camel - Trewornan Dam SW 980 742

Donovan Kelley (DK) was a keen bass angler, and a great authority on bass recruitment. He was the original inspiration for our survey work. This site was one of his regulars; he notes that this site gives consistent results, which accurately reflect the strength of the year class, with August being the best month for surveys.

Farmer James Menhennick kindly allowed us to drive across his fields to the dam site. He showed us where DK used to stop-net the mouth of a small side creek. We did not attempt this, or the Amble channel, which looks too difficult to net due to soft mud.

We netted the small creek along the N end of the dam. A tide of ~ 4.7m (Falmouth), about 40 minutes before HW appears to be best.

Camel - Rail Bridge Pool. Grid reference SW 927 742.

Another of Donovan Kelley's regular sites, which I recall helping him with many years ago, is the Rail Bridge Pool near Padstow. The net is drawn through the tidal pool under the old iron railway bridge over LW. The position of the pool may change from year to year.

Gannel - Trevean Way public slipway. Grid reference SW 801 610.

The site has easy access to the channel near a public slipway. A small tide was chosen so that the channel remained defined and the current wasn't too strong. Netting commenced just after HW, and continued until the water was too shallow. The 30m net was held across the channel for 10 minutes before bringing to the north bank. '0' groups were found from just after HW to about 1.5 hours after. This looks to be a promising site.



Gannel Estuary. Rob Hillman. Photo credit Robin Bradley.

PERMISSIONS

Cornwall Inshore Fisheries and Conservation Authority

A dispensation to use a seine net with an under-size mesh to catch fish for research was obtained from Cornwall IFCA after completing their online Byelaw and Regulating Order Dispensation Application Form.

This dispensation was updated to include retaining a total of 210 juvenile bass from the Helford and Fal for research at Plymouth University, after submitting a revised application in June.

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

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 210 undersized bass for research. This would have enabled us to transport these fish by boat from the collection site to the embarkation point. In the event samples were only collected from sites which were accessed without a boat.

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 of not less than £5M, risk assessments of the activities undertaken, and other necessary consents, including that from CIFCA.

Natural England

Natural England have confirmed that the work is not likely to have a negative impact on the conservation objectives of the Fal and Helford SAC or SSSI. They also confirm that additional consent from NE, over and above that from CIFCA and the Duchy, is not required.

Environment Agency

The EA have confirmed that we do not have to apply for consent from them to undertake this work. They have asked to be notified of each survey in advance.

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.

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.

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 group leader 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.

RB attended a RYA First aid course in February 2022 provided locally by Falmouth Training Solutions. This is valid until February 2025.

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. Insurance costs for volunteers who use their own boats on surveys will vary, depending on what cover they already have for their main boat usage. If public liability cover has to be purchased specifically to do the survey work, this would typically cost around £130pa. If an upgrade is required e.g. to

increase basic (£1m) cover to meet the £5m requirement of the Duchy of Cornwall, this would typically cost around £50pa.

Fuel costs for boats are not insignificant. For example, a boat launching from the Loe Beach area to get to one of the sites on the Fal would use about 15 litres of fuel – about £25 at current (Nov 23) prices. Travelling to the Helford sites from the same launching area would use about 22 litres - about £35 worth.

Storage costs for the dinghy amount to £140pa.

Equipment costs include larger purchases, such as replacement, or additional nets (typically around £1,500), and smaller purchases such as thermometers, salinometers, air pumps, buckets, ropes 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/lifejackets etc.

Costs are currently borne by the scheme organiser, or individual boat owners, in the first instance. A new net for use by the group was purchased by BASS, who are partnering Plymouth University on the 'FinVision' Fisheries Industry Science Partnership project. Funding for this will be reclaimed from FISP funds. Other significant costs (e.g. insurance cover for the scheme and dinghy storage costs) may also be available from these funds while the project is running. Due to the non-availability of boat cover this year no boat-associated costs were incurred.

SURVEY REPORTS - Fal

FAL BASS MONITORING 2023

SITE No. F16 Penpol Creek SW 812 388

DATE 21.5.23

OPERATORS Robin Bradley, Ian Ingram, Rob Hillman.

APPROXIMATE AREA NETTED 600 m2

METHOD 30 x 2m net drawn across corner above causeway at the head of the creek using rope, then drawn to shore.

WEATHER CONDITIONS

Temperature °C 26

Wind S Light breeze

Cloud 3/8

Precipitation Nil

Overall Conditions Rating Very good

TIDES (Falmouth BST)

H.W 0704 (4.9m)

L.W 1345 (0.7)

H.W 1917 (5.0)

WATER CONDITIONS

Temperature °C 21.0

Salinity (‰) 25 *

Clarity 0.25m

Surface Smooth

Average depth 0.5m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2019		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1745			1	11.2			1	7.2	1	4.6	*Salinity measured using ATAGO S/Mill-E refractometer.
							1	7.5	1	5.5	~ 50 common gobies (3.2 – 4.3cm)
							1	7.7	1	5.9 TK	~ 100 sand smelt
							1	7.8	1	6.8 TK	~ 1,000 mullet
							1	8.1	1	6.9 TK	
							1	8.5	1	7.9 TK	
							1	9.0	1	8.0 TK	
							2	9.4	1	8.4 TK	
									1	8.8 TK	
									1	9.0 TK	
									1	9.2 TK	
									1	10.0 TK	
	0		0		0						

FAL BASS MONITORING 2023

SITE No. F5 St Clement SW 852 440

DATE 24.5.23

OPERATORS Robin Bradley, Ian Ingram

APPROXIMATE AREA NETTED N/A

METHOD Held 20 yard net against tide for 10 mins x 4

WEATHER CONDITIONS

Temperature °C 24

Wind N moderate breeze (cool)

Cloud 1/8

Precipitation Nil

Overall Conditions Rating Fair

TIDES (Falmouth BST)

H.W 0847 (4.4)

L.W 1518 (1.4)

H.W 2101 (4.6)

WATER CONDITIONS

Temperature °C 16.7

Salinity (‰) 21*

Clarity < 1 ft

Surface Ripples

Average depth 1 m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1332							3	5.1	1	7.3 TK	~ 25 mullet ~ 50 smelt. Occ crabs. Occ prawn on last haul.
1400							1	9.2	1	8.5 TK	Occ goby @ 4.5cm
1420									1	11.2 TN	1 x pilchard @ 9.3cm
1450											1 x herring @ 12.3
											1 x flounder @ 40cm
											This was a trial run which proved the suitability of the site for netting purposes. Tide height was about right.
											Most fish came on first run i.e. 1 hr 45 mins before LW.
											Use 30 yard net next time and start at LW -2h 15min.
											*Salinity measured using ATAGO S/Mill-E refractometer.
	0		0		0						

FAL BASS MONITORING 2023

SITE No. F10 Weir beach SW 819 367

DATE 25.5.23

OPERATORS Robin Bradley, Gavin Ingram, Simon Willey

APPROXIMATE AREA NETTED 3 x 100m²

METHOD Walked 30m net out from shore as far as poss (~20m), hauled along perpendicular to shore for ~50m then brought far end to shore. X 2 below beach house, x 1 from beach.

WEATHER CONDITIONS

Temperature °C 19

Wind E Light breeze

Cloud 3/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 0923 (4.2)

L.W 1551 (1.6)

H.W 2140 (4.4)

WATER CONDITIONS

Temperature °C 17.0

Salinity (‰) 29 *

Clarity To bottom

Surface Sl ripple

Average depth ~1m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1500							1	5.0			*Salinity measured using ATAGO S/Mill-E refractometer.
1515							3	9.5			~ 50 gobies @ 3.1 – 5.0cm
1545							1	10.0			Occ prawns (~6.0cm) and shrimps (~5.0cm)
							1	10.2			Occ pollack @ 6.3 – 6.5cm
							1	13.0			Occ juv herring
							1	13.5			~ 600 smelt (~500 on last haul).
											Slightly bigger tide (~1.1) might be better.
											This site produces mainly 2 year-olds in autumn ? '1' groups in spring/summer. Would be worth trying holding net against the tide @ LW -2.
	0		0		0						

FAL BASS MONITORING 2023

SITE No. F7 Head of Polingey Creek SW 866 351

DATE 31.5.23

OPERATORS Robin Bradley, Bradley Wiffen

APPROXIMATE AREA NETTED ~100 sq m

METHOD Hauled 10m net through pool left by retreating tide on S side just above causeway.

WEATHER CONDITIONS

Temperature °C 27

Wind NE Light air

Cloud 0/8

Precipitation Nil

Overall Conditions Rating Very good

TIDES (Falmouth BST)

H.W 0247 (4.3)

L.W 0927 (1.4)

H.W 1526 (4.3)

WATER CONDITIONS

Temperature °C 20.6 creek (23.0 in pool)

Salinity (‰) 29 *

Clarity < 1ft in pool

Surface Smooth

Average depth < 1ft

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
											*Salinity measured using ATAGO S/Mill-E refractometer.
											~ 200 small mullet @ 4.5cm to 9.5cm + 1 GG @ 12.0cm
											~ 50 small shrimp/prawns
											Netted @ 1800
											Mud very soft around pool margins.
	0		0		0						

FAL BASS MONITORING 2023

SITE No. F3 Gorrangorras Creek SW 794 347

DATE 7.6.23
(observing)

OPERATORS Robin Bradley, Rob Hillman, Bradley Wiffen, Jason Collins

APPROXIMATE AREA NETTED N/A

METHOD 30m net held across incoming tide below spit for 10 mins and brought to W shore x 2.

WEATHER CONDITIONS

Temperature °C 22

Wind E Moderate breeze

Cloud 0/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 0823 (4.8)

L.W 1449 (0.8)

H.W 2040 (5.0)

WATER CONDITIONS

Temperature °C 24.7

Salinity (‰) 14 *

Clarity < 1ft

Surface Smooth

Average depth 2ft

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1704			1	10.9			1	2.6	1	4.9	20m net sufficient for this survey and less weight to carry.
1728			1	11.0			1	7.5	1	5.5	*Salinity measured using ATAGO S/Mill-E refractometer.
			1	11.7			1	8.0	1	5.6	All bass on first haul @ LW + 2h 15mins
			1	13.7			1	8.2	1TK	6.2	~ 200 mullet - mainly on on first netting.
							3	8.5	1	6.5	~ 100 sand smelt – more on second netting
							1	8.7	1 GG	6.6	~ 20 common gobies @ 4.1 – 4.5cm
							1	8.9	1TK	6.7	A few shore crabs
									1	6.9	~ 10 gilthead bream @ 4.0 – 5.0cm + 1 @ 17.1cm
									1TK	7.1	
									1GG	7.2	
									1TK	7.7	
									2TK	7.8	
									1TK	8.1	
									1TK	8.2	
									1TK	8.6	
									2TK	8.9	
									1GG	12.0	
									1TK	12.5	
	0		4	Ave 11.8	0						

FAL BASS MONITORING 2023

SITE No. F7 Tresillian SW 859 452
APPROXIMATE AREA NETTED N/K

DATE 15.6.23

OPERATORS Robin Bradley, Rob Hillman

METHOD Various

WEATHER CONDITIONS

Temperature °C 26

Wind S – Gentle breeze

Cloud 0/8

Precipitation Nil

Overall Conditions Rating Very good

TIDES (Falmouth BST)

H.W 0347 (4.6)

L.W 1025 (1.0)

H.W 1616 (4.6)

WATER CONDITIONS

Temperature °C 23.0

Salinity (‰) 30 *

Clarity 2-3ft

Surface Ripples

Average depth 2ft

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1515									1 TK	11.4	*Salinity measured using ATAGO S/Mill-E refractometer.
1530									1 TK	11.6	Various hauls tried in corner by derelict scout hut.
1545											A few mullet .Occ goby (5.6cm) & sand smelt (10cm). One pilchard (15cm).
1600											This was a trial run in ideal conditions. Results suggest this site is not worth pursuing.
	0		0		0						

FAL BASS MONITORING 2023

SITE No. F16 Penpol Creek SW 812 388

DATE 19.6.23

OPERATORS Robin Bradley, Bradley Wiffen, Ian Ingram.

APPROXIMATE AREA NETTED 600 m²

METHOD 30 x 2m net drawn across corner above causeway at the head of the creek using rope, then drawn to shore.

WEATHER CONDITIONS

Temperature °C 24

Wind S Gentle breeze

Cloud 2/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 0646 (4.7)

L.W 1325 (0.9)

H.W 1900 (4.9)

WATER CONDITIONS

Temperature °C 24.4

Salinity (‰) 28*

Clarity 0.25m

Surface Ripples

Average depth 0.5m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1715	1	3.4	1	13.3	1	18.6**	1	3.6	1 TK	6.6	*Salinity measured using ATAGO S/Mill-E refractometer.
	1	3.6	1	13.4			1	8.0	1 TN	7.3	
	1	3.7	1	13.8			1	8.4	1 TK	8.3	
			1	14.0			1	8.7	2 TK	10.0	~ 25 shore crabs
			1	14.2			1	9.4	1TK	10.2	~ 100 mullet
			1	14.3			1	9.5	1TK	10.5	~ 25 smelt
			2	14.5			1	9.9	1TK	10.6	~ 50 common gobies @ 4.0 – 4.2cm
			1	14.8					1TK	11.0	1 x flounder @ 4.0cm, 2 @ 4.5cm, 1 @ 6.4
			1	15.2					1TK	11.5	** Age confirmed from scales
			1	15.5					1TK	11.7	
			1	15.7**					1TK	12.7	
			1	15.9					1TK	14.1	
			2	16.0					1TK	14.2	
									1GG	23.0	
	3	Ave 3.6	15	14.7	1	18.6					

FAL BASS MONITORING 2023

SITE No. F16 Penpol Creek SW 812 388
APPROXIMATE AREA NETTED 600 m2

DATE 4.8.23

OPERATORS Robin Bradley, Ian Ingram, John Shipwright

METHOD 30 x 2m net drawn across corner above causeway at the head of the creek using rope, then drawn to shore.

WEATHER CONDITIONS

Temperature °C 19
Wind NW Light breeze
Cloud 8/8
Precipitation Nil
Overall Conditions Rating Poor

TIDES (Falmouth BST)

H.W 0807 (5.2)
L.W 1441 (0.3)
H.W 2021 (5.5)

WATER CONDITIONS

Temperature °C 18.7
Salinity (‰) 32 *
Clarity 0.25m
Surface Ripples
Average depth 0.5

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1830	1	6.1					1	2.8	2	3.5	*Salinity measured using ATAGO S/Mill-E refractometer.
	1	8.7					1	3.4	2	3.8	~200 Sand smelt
							1	3.6	1	4.4	~ 100 Mullet
							1	4.0	2	5.0	~ 10 Shore crabs
							1	4.4	1	5.5	
							1	4.9	1 TN	10.0	
							1	5.2	1 TN	10.2	
							3	6.0	1 GG	11.3	
							4	6.5	1 TN	11.7	
							2	11.0	1 TN	12.2	
	Tot = 2	Ave = 7.4	0		0						

FAL BASS MONITORING 2023

SITE No. F5 St Clement SW 852 440

DATE 9.8.23

OPERATORS Robin Bradley, Rob Hillman, Isaac Hillman, Jason Collins

APPROXIMATE AREA NETTED N/A

METHOD Held 30 yard net against tide for 10 mins x 5, increasing distance from shore progressively (10yds initially).

WEATHER CONDITIONS

Temperature °C 21

Wind S/SW Light breeze

Cloud 8/8 reducing.

Precipitation Nil

Overall Conditions Rating Fair

TIDES (Falmouth BST)

H.W 1143 (4.3)

L.W 1819 (1.5)

H.W

WATER CONDITIONS

Temperature °C 20.0

Salinity (‰) 16 *

Clarity < 1ft

Surface Ripples

Average depth Variable with tide falling.

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1610	1	3.9					1	3.3	1	3.1	*Salinity measured using ATAGO S/Mill-E refractometer.
1630	1	4.2					1	3.6	2	3.2	This was the first survey here, following a trial in June.
1650	1	4.3					1	3.7	1	3.3	Current seems to increase and decrease erratically – even change direction before LW.
1710	1	4.4					1	4.6	1	3.4	20 yard net would be adequate.
1735	2	4.5					2	4.7	1	3.5	Bass on all hauls - most (10) at 1630-1640 i.e LW - 1hr 45
	1	4.6					2	5.0	1	4.0	Good range of other species including ~ 5,000 sprats (5.1 - 8.7cm) on last haul, lesser pipefish (~ 9.6cm), herring (10.4 - 12.2cm). Approx 500 sand smelt. Not many mullet. Approx 25 shore crabs. Some interesting transparent thin fish ~ 3cm - probably sprat or herring. Occ common goby (~4cm) and one sand goby (6.8cm).
	2	4.8					1	10.7			
	2	4.9					1	10.9			
	1	5.0					1	11.0			
	2	5.2									
	2	5.3									
	2	5.6									
	1	5.7									
	1	5.9									
	2	6.0									
	1	6.1									
	2	6.5									
	1	6.7									

Bass Investigations in Cornwall 2023

	3	6.9								
	3	7.0								
	2	7.1								
	3	7.2								
	2	7.3								
	1	7.4								
	1	7.5								
	1	7.7								
	4	7.8								
	1	7.9								
	1	8.0								
	Total = 48	Ave = 6.2	0		0					

FAL BASS MONITORING 2023

SITE No. F16 Penpol Creek SW 812 388

DATE 17.8.23

OPERATORS Robin Bradley, John Shipwright

APPROXIMATE AREA NETTED 600 m2

METHOD 30 x 2m net drawn across corner above causeway at the head of the creek using rope, then drawn to shore.

WEATHER CONDITIONS

Temperature °C 21

Wind SE Gentle breeze dropping

Cloud 8/8

Precipitation Nil

Overall Conditions Rating Fair

TIDES (Falmouth BST)

H.W 0652 (4.8)

L.W 1328 (1.0)

H.W 1905 (5.0)

WATER CONDITIONS

Temperature °C 19.6

Salinity (‰) 30 *

Clarity 1ft initially, then zero.

Surface Ripples

Average depth 0.5

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1720	1	4.5					1	6.2	1	4.0	*Salinity measured using ATAGO S/Mill-E refractometer.
	1	5.0					1	7.1	1	4.2	~ 1,000 small mullet (~4cm).
	1	5.6					1	7.9	1	4.5	Occ shore crabs.
	1	5.8							1	8.8	
	1	6.0							1 GG	10.0	
	1	6.2							1 GG	10.5	
	1	6.3							2 GG	10.6	

Bass Investigations in Cornwall 2023

	3	6.4							2 GG	11.0	
	3	6.5							1 GG	11.3	
	4	6.6							1 GG	11.5	
	1	6.7							2 GG	12.0	
	2	6.8								1	
	1	6.9									
	3	7.0									
	2	7.2									
	2	7.3									
	4	7.5									
	1	7.6									
	1	7.7									
	4	7.8									
	1	7.9									
	7	8.0									
	4	8.1									
	2	8.2									
	2	8.3									
	3	8.5									
	1	8.6									
	1	8.7									
	2	8.8									
	1	8.9									
	1	9.0									
	3	9.2									
	2	9.3									
	1	9.4									
	1	10.0									
	Total	Ave	0		0						
	70	7.6									

FAL BASS MONITORING 2023

SITE No. F3 Gorrangorras Creek 794 347

DATE 22.8.23

OPERATORS Robin Bradley, Bradley Wiffen, Jason Collins

APPROXIMATE AREA NETTED N/A

METHOD 20m net held across incoming tide for 10 mins and brought to W shore x 3.

WEATHER CONDITIONS

Temperature °C 20

Wind S Light breeze

Cloud 3/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 0908 (4.6)

L.W 1542 (1.2)

H.W 2114 (4.7)

WATER CONDITIONS

Temperature °C 23.9

Salinity (‰) 18 *

Clarity < 1ft

Surface Smooth

Average depth 2ft

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1747	1	5.0					1	5.5	2	3.9	*Salinity measured using ATAGO S/Mill-E refractometer.
1802	2	5.1					1	6.0	1	4.2	~ 1,000 small mullet (~4cm).
1820	1	5.2					1	7.0	1	4.4	A few sand smelt
	3	5.5							1	4.5	1 gilthead bream (7.3cm) with mouth deformity
	1	5.6							1GG	8.0	20m net fine. First two hauls from below spit. Last haul slightly nearer to boulder causeway due to widening channel.
	2	5.8							1GG	9.0	~ 10 bass on first haul @ LW + 2h 5m. Remaining bass came on second haul @ LW + 2h 20m. No bass on final haul @ LW + 2h 40m, but fixed weed on bank caused lead rope to roll over, probably losing fish.
	1	5.9							1GG	9.7	Best result here (290) at similar tide state in September 2016, but tide was 5.4m.
	1	6.5									
	1	6.8									
	2	7.0									
	1	7.3									
	1	7.4									
	7	7.5									
	1	7.6									
	1	7.7									
	1	7.9									
	2	8.0									
	2	8.1									
	1	8.2									
	2	8.4									

Bass Investigations in Cornwall 2023

	2	8.6								
	1	8.8								
	1	9.4								
	Total 38	Ave 7.1	0		0					

FAL BASS MONITORING 2023

SITE No. F5 St Clement SW 852 440

DATE 23.8.23

OPERATORS Robin Bradley, Ben Harris

APPROXIMATE AREA NETTED N/A

METHOD Held 20 yard net against tide for 10 mins x 4, increasing distance from shore progressively (10yds initially).

WEATHER CONDITIONS

Temperature °C 21

Wind S Light breeze

Cloud 2/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 0929 (4.5)

L.W 1617 (1.4)

H.W 2145 (4.5)

WATER CONDITIONS

Temperature °C 21.6

Salinity (‰) 25 *

Clarity < 1ft

Surface Ripples

Average depth Variable with tide falling.

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1413							1	4.5	2	3.5	*Salinity measured using ATAGO S/Mill-E refractometer.
1430							4	5.5	2	3.7	~ 200 small mullet and sand smelt in total
1445							1	6.0	1	4.0	A few gobies ~ 5cm
1512							1	6.5	1	4.9	Occ herring ~ 5.5cm
							1	7.0			1 pipefish @ 15.5cm
							1	8.0			
							1	9.5			
							1	10.0			
							1	11.5			No bass & fewer fish overall than last survey (9/8) when 48 '0' groups were found. Tide height v.similar. Netting was slightly earlier in the afternoon, but water temp was slightly higher. Possible that '0' groups may have moved down the river, but EA surveys have found '0' groups in September at Treffry, so unlikely. The 20 yard net has slightly fewer weights than the 30 yard net. This works well at sites like Gorrangorras, where there is little flow, but the buoy rope here may have lifted the lead rope off the bottom, causing fish to escape. We discovered that the buoy + rope can be lifted out of the water and placed away from the netting area. Probably best to use 30yd net next time.
	0		0		0						We had a visit from EA Enforcement Officer Ben Pessl.

FAL BASS MONITORING 2023

SITE No. F3 Gorrangorras Creek 794 347

DATE 4.9.23

OPERATORS Robin Bradley, Bradley Wiffen, Jason Collins

APPROXIMATE AREA NETTED N/A

METHOD 20m net held across incoming tide for 10 mins and brought to W shore x 1

WEATHER CONDITIONS

Temperature °C 24

Wind E Fresh breeze

Cloud 0/8 Hazy sunshine

Precipitation Nil

Overall Conditions Rating Fair

TIDES (Falmouth BST)

H.W 0901 (5.2)

L.W 1536 (0.4)

H.W 2117 (5.2)

WATER CONDITIONS

Temperature °C 23.2

Salinity (‰) 22 *

Clarity < 1ft

Surface Ripples

Average depth 2 ft

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1732	1	4.6							1GG	6.2	Salinity measured using ATAGO S/Mill-E refractometer.*
	2	5.2							1GG	8.0	~ 2,000 small (~4cm) mullet
	3	5.5							1GG	9.5	
	1	5.7							1GG	9.8	
	2	5.8							1GG	10.0	
	2	5.9							1TK	10.0	
	1	6.1							1GG	10.2	
	4	6.2							1GG	10.5	
	4	6.4							1TK	11.0	
	3	6.5							1TK	11.1	
	2	6.6							1GG	11.5	
	1	6.7									
	1	6.9									
	2	7.0									
	1	7.2									
	3	7.3									
	2	7.6									
	2	7.8									
	1	7.9									
	6	8.0									
	1	8.4									
	5	8.5									

Bass Investigations in Cornwall 2023

	2	8.6									
	1	8.7									
	3	9.0									
	1	9.1									
	4	9.2									
	2	9.3									
	1	9.4									
	2	9.9									
	1	10.7									
	Tot6 7	Ave 7.5									
Not measured	8										
Grand total	75		0		0						

FAL BASS MONITORING 2023

SITE No. F5 St Clement SW 852 440

DATE 6.9.23

OPERATORS Robin Bradley, Rob Taylor.

APPROXIMATE AREA NETTED N/A

METHOD Held 30 yard net against tide for 10 mins x 5, increasing distance from shore progressively (10yds initially).

WEATHER CONDITIONS

Temperature °C 25

Wind S/SE Light air

Cloud 3/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 1010 (4.6)

L.W 1650 (1.3)

H.W 2227 (4.4)

WATER CONDITIONS

Temperature °C 23.3

Salinity (‰) 25 *

Clarity < 1ft

Surface Ripples

Average depth Variable with tide falling.

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1430	1	5.2					1	5.2	1	5.0	*Salinity measured using ATAGO S/Mill-E refractometer.
1450	1	9.5					1	6.2			~100 Sand smelt
1512							1	10.5			~50 small (~5cm) mullet
1530							1	11.0			~25 scad @ 9.4, 9.5, 11.0, 12, 16.0, 20.0cm
1550							1	11.2			~10 Herring @ 11.2, 12.5cm
							1	12.0			~100 spratts (~7cm)
											2 pipefish @13cm
											A few crabs
											+++Mysids
											Occ Common goby (5.5cm)
											1 Pouting @ 14.5cm
											The buoy had been moved so there was no obstruction. Using the 30 yd net didn't seem to improve things, so the 20 yard net is fine here.
											'0' groups only seem to be here until mid-Aug. ? Move higher up estuary after this. Try once more in early Oct in case they are moving back down.
Total	2		0			0					

FAL BASS MONITORING 2023

SITE No. F7 Head of Polingey Creek SW 866 351

DATE 9.9.23

OPERATORS Robin Bradley, Nigel Burley

APPROXIMATE AREA NETTED ~100 sq m

METHOD Hauled 10m net through pool left by retreating tide on S side just above causeway.

WEATHER CONDITIONS

Temperature °C 24

Wind E Light air

Cloud 2/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 1400 (3.9)

L.W 2015 (2.2)

H.W 0252 (3.7)

WATER CONDITIONS

Temperature °C 25.6

Salinity (‰) 35 *

Clarity < 1ft in pool

Surface Smooth

Average depth < 1ft

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1645	1	6.0							2	4.0	*Salinity measured using ATAGO S/Mill-E refractometer.
									1	4.5	~ 2,000 small mullet @ 4-5cm
									1	4.8	~ 50 small shrimp/prawns @ ~ 5cm
									1GG	10.0	A few crabs
									2GG	10.5	A few small gobies @ ~4cm
									1TK	10.6	A speculative netting in the creek produced more small mullet and a few small smelt.
									1GG	10.7	
									1GG	12.0	
Total	1		0		0						

FAL BASS MONITORING 2023

SITE No. F16 Penpol Creek SW 812 388

DATE 15.9.23

OPERATORS Robin Bradley, Bradley Wiffen, Ryan Hepburn (Plymouth University)

APPROXIMATE AREA NETTED 600 m2

METHOD 30 x 2m net drawn across corner above causeway at the head of the creek using rope, then drawn to shore (x2).

WEATHER CONDITIONS

Temperature °C 20

Wind S Gentle breeze

Cloud 4/8

Precipitation Nil

Overall Conditions Rating Fair

TIDES (Falmouth BST)

H.W 0627 (4.9)

L.W 1301 (0.9)

H.W 1839 (5.1)

WATER CONDITIONS

Temperature °C 20.6

Salinity (‰) 30 *

Clarity 1ft initially, then zero.

Surface Ripples

Average depth 0.5m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1655 & 1710	1	6.5						1	5.0	*Salinity measured using ATAGO S/Mill-E refractometer.	
	1	6.8						1	5.5	~50 small mullet	
	1	8.0						1	5.6	~20 shrimps @~5cm	
	1	8.8						1	5.8	~ 10 common goby, @3-5cm	
	1	10.1						2	6.0	~20 small shore crab	
								1	6.3	5 bass retained by PU personnel for research	
								1	12.0	1 bass on first haul, 4 on second.	
								1	12.2		
	Tot = 5	Ave = 8.0	0			0					

FAL BASS MONITORING 2023

SITE No. F4 Head of Cowlands Creek SW 830 408

DATE 16.9.23

OPERATORS Robin Bradley, Ian Ingram

APPROXIMATE AREA NETTED 540 m²

METHOD Pulled 30 yd net out from S side using long rope (~70m) from N side, until trailing end of net is level with first grassy point and net is about 30m out, then pulled each end to grassy bank in the middle of creek.

WEATHER CONDITIONS

Temperature °C 20

Wind E Gentle breeze

Cloud 8/8

Precipitation Intermittent

Overall Conditions Rating Poor

TIDES (Falmouth BST)

H.W 0702 (5.0)

L.W 1328 (0.9)

H.W 1912 (5.1)

WATER CONDITIONS

Temperature °C 19.5

Salinity (‰) 21 *

Clarity < 1ft

Surface Ripples

Average depth 0.5m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1710	1	5.4						2	5.0	*Salinity measured using ATAGO S/Mill-E refractometer.	
	1	7.9						1	5.2	~500 mullet of various sizes	
	2	8.8						1	8.2	Occ common goby @~4cm	
	1	9.0						1	9.0	Occ sand smelt @ ~4cm	
	1	9.1						1	10.2	5 gilthead bream @ 12.5 - 14.4cm	
	1	9.3						1	11.5	This was a first netting here since unsuccessful attempts in 2001 & 2002.	
	1	9.5						2	12.0		
	2	9.6						1	12.2		
	1	9.7						1TL	13.0		
	1	9.8						1GG	17.7		
	2	9.9						1GG	18.0		
	1	10.0						1GG	18.6		
	3	10.2									
	1	10.3									
	4	10.4									
	1	10.5									
	1	10.6									
	2	10.8									
	4	10.9									
	1	11.0									
	2	11.1									
	2	11.3									

Bass Investigations in Cornwall 2023

	3	11.4								
	1	11.5								
	2	11.6								
	1	12.1								
	Tot 43	Ave 10.3	0		0					

FAL BASS MONITORING 2023

SITE No. F3 Gorrangorras Creek 794 347

DATE 18.9.23

OPERATORS Robin Bradley, Bradley Wiffen, Ian Ingram

APPROXIMATE AREA NETTED N/A

METHOD 20m net held across incoming tide for 10 mins and brought to W shore x 1

WEATHER CONDITIONS

Temperature °C 19

Wind W Fresh breeze

Cloud 4/8

Precipitation Nil

Overall Conditions Rating Fair

TIDES (Falmouth BST)

H.W 0801 (4.9)

L.W 1418 (0.9)

H.W 2004 (5.0)

WATER CONDITIONS

Temperature °C 20.0

Salinity (‰) 21 *

Clarity <1ft

Surface Smooth

Average depth 2 ft

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1615	1	4.7						2	4.5	* Salinity measured using ATAGO S/Mill-E refractometer.	
	1	5.0						1	4.6	~ 500 small mullet	
	1	5.1						1	4.7	Surprised to see such small '0' groups at this time ? spawned mid-May	
	1	5.3						1	4.8		
	1	5.4						1	5.0		
	4	5.5						1	5.4		
	1	5.6						2	9.0		
	1	5.7						1	9.5		
	3	5.8						1	10.2		
	2	6.0						1	10.3		
	1	6.1						1	10.9		
	1	6.3						2	11.2		
	2	6.5									
	2	6.7									
	1	6.9									
	5	7.0									

Bass Investigations in Cornwall 2023

	1	7.1									
	3	7.2									
	1	7.3									
	2	7.4									
	2	7.5									
	1	7.6									
	1	7.7									
	1	7.8									
	4	8.0									
	1	8.1									
	1	8.2									
	1	8.4									
	1	8.5									
	1	8.8									
	1	8.9									
	3	9.0									
	2	9.2									
	1	9.3									
	2	9.4									
	5	9.5									
	3	9.6									
	6	9.7									
	2	9.8									
	2	9.9									
	6	10.0									
	5	10.2									
	4	10.3									
	1	10.4									
	6	10.5									
	2	10.6									
	3	10.7									
	7	10.8									

Bass Investigations in Cornwall 2023

	1	10.9								
	2	11.1								
	1	11.2								
	Tot 114	Ave 8.7#								
Not meas	132									
Grand total	246		0		0					



Chart: Danny Bowering

FAL BASS MONITORING 2023

SITE No. F4 Head of Cowlands Creek SW 830 408

DATE 1.10.23

OPERATORS Robin Bradley, Ian Ingram

APPROXIMATE AREA NETTED 540 m²

METHOD Pulled 30 yd net out from S side using long rope (~70m) from N side, until trailing end of net is level with first grassy point and net is about 30m out, then pulled each end to grassy bank in the middle of creek.

WEATHER CONDITIONS

Temperature °C 19.5

Wind Light air WSW

Cloud 8/8

Precipitation Nil

Overall Conditions Rating Poor

TIDES (Falmouth BST)

H.W 0717 (5.4)

L.W 1357 (0.1)

H.W 1933 (5.6)

WATER CONDITIONS

Temperature °C 18.4

Salinity (‰) 15 *

Clarity < 1ft

Surface Smooth

Average depth 0.5m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1730	1	8.5	1	18.5	1	23.0	1	4.5	1	4.5	*Salinity measured using ATAGO S/Mill-E refractometer.
	1	9.0	1	18.6	1	24.5	1	6.0	1	5.2	~200 small mullet
	2	9.7	1	19.4	1	25.0			1	5.3	~ 100 small sand smelts
	2	10.5			1	25.1			1	5.7	Note: all 1 and 2 year-olds checked by scale reading
	1	10.6							1	8.6	
	1	11.4							1	9.2	
	1	11.6							1	9.5	
	1	11.7							1	9.8	
	1	11.8							1	11.6	
	1	12.0							1 TN	12.0	
	1	12.4							1 TK	12.5	
									1 TK	13.5	
									1 TK	17.0	
	Tot	Ave	Tot	Ave	Tot	Ave					
	13	10.7	3	18.8	4	24.4					

FAL BASS MONITORING 2023

SITE No. F5 St Clement SW 852 440
APPROXIMATE AREA NETTED N/A

DATE 5.10.23

OPERATORS Robin Bradley, Ryan Hepburn (Plymouth University)

METHOD Held 20 yard net against tide for 10 mins x 5, increasing distance from shore progressively (10yds initially).

WEATHER CONDITIONS

Temperature °C 18
Wind SW Gentle Breeze
Cloud 4/8
Precipitation Nil

TIDES (Falmouth BST)

H.W 0933 (4.7)
L.W 1617 (1.4)
H.W 2150 (4.3)

WATER CONDITIONS

Temperature °C 16.6
Salinity (‰) 23 *
Clarity 1 ft
Surface Waves
Average depth Variable with tide falling

Overall Conditions Rating Fair

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1408	1	7.6					1	6.4	1	4.1	*Salinity measured using ATAGO S/Mill-E refractometer.
1423							2	6.6	1	4.5	~200 small mullet over whole survey
1440							1	6.8	1	5.0	Occ goby (common) @ ~4.5cm + 1 sand goby @ 7.3cm
1456							1	6.9	1	5.1	Occ sprat @ ~7.5cm
1510							1	7.1	1	5.4	Occ scad @ 8.7, 9.2, 10.5cm
							1	8.5	1	5.5	Occ herring @ 13.0, 14.0cm
							1	9.8	1	8.9	The single bass came at 1456 i.e. @ LW-1.25
							1	11.1			Occ pilchard
							1	12.3			The pilchards and herring on the last run i.e. LW -1
											We attempted to pll the buoy in but this was not possible. Tide became strong on last run, and net footrope was riding over buoy rope, lifting it off the bottom. The buoy was pulled under foot rope, upstream, so that the buoy could assume the correct position. In future need to deploy the net downstream (i.e. to the right) of the buoy.
Total	1		0			0					

SURVEY REPORTS - Helford

HELTFORD BASS MONITORING 2023

SITE No. H20 Head of Polwheveral Creek SW 739 284

DATE 20.5.23

OPERATORS Robin Bradley, Simon Willey, Craig Baldwin, Gavin Ingram, Bradley Wiffen, Rachel Turnbull (Plymouth University).

APPROXIMATE AREA NETTED 900 m²

METHOD Seine net hauled by wading. Net 29.5 m' long by 2.0 m' deep. Mesh size approx' 5 mm knot to knot.

WEATHER CONDITIONS

Temperature °C 24

Wind N Light air

Cloud 0/8

Precipitation Nil

Overall Conditions Rating Very good

TIDES (Falmouth BST)

H.W 0625 (5.0m)

L.W 1309 (0.5m)

H.W 1841 (5.0m)

WATER CONDITIONS

Temperature °C 20.0

Salinity(‰) 0*

Clarity < 0.3m

Surface Slight ripple

Average depth ~1m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1740			1	13.5			1	7.9	1	5.5 TK	*Salinity measured using ATAGO S/Mill-E refractometer.
			1	13.9			1	8.4	1	6.0 TK	~ 200 mullet
			1	14.1			2	8.6	1	7.5 TK	~ 50 sand smelt
			1	14.2			1	8.7	1	9.8 TK	** Best growth seen at this date since surveys began.
			1	14.4			1	13.4	1	11.5 G	
									1	11.9 G	
									1	12.2 G	
									1	13.0 G	
									1	13.1 G	
									1	13.5 TK	
									1	13.7 G	
									1	28 TK (est)	
Total	0		5	Ave 14.0 **	0						

HELTFORD BASS MONITORING 2023

SITE No. H2 Bonallack – main channel SW 718 260

DATE 12.6.23
Pinch*

OPERATORS Robin Bradley, Bradley Wiffen, George Brew, Brian Collick, Kevin

APPROXIMATE AREA NETTED N/A

METHOD 30m net held against the tide in the channel below small causeway to the left of farm track for 10 minutes, and brought to N bank x 3.

WEATHER CONDITIONS

Temperature ° C 25

Wind NW Gentle breeze

Cloud 3/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 1327 (4.2)

L.W 1941 (1.3)

H.W 0147 (4.5)

WATER CONDITIONS

Temperature °C 21.0

Salinity (‰) 29**

Clarity < 1ft

Surface Smooth

Average depth 2 ft

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
									1 (TK)	14.0	* We are very much indebted to Kevin for securing permission from the landowner (James Lyall) to access the site from the shore, and for transporting the net box and other gear to the site.
1740											** Measured using ATAGO S/Mill-E refractometer.
1810											Tide too strong on first run (LW – 2) - aborted. Most fish *** on second run (LW – 1.5). Few fish (smelt) on third run (LW – 1). We were not able to completely span the channel at any point (last run was about 2m short). ? Need 1.0m LW tide. Aim to net from LW – 1.5 to LW if poss.
1840											*** ~ 200 sand smelts (~9cm). A few pilchards (13 - 14cm) and sprats (8.0cm). Lots of tiny (3cm) ? juvenile sprats. Some shore crabs, especially on last run. Occ goby (5.0cm). +++ mysids. Occ herring (5.5cm). Some large mullet were seen to jump the net.
Total	0		0		0						

HELFORD BASS MONITORING 2023

SITE No. H20 Head of Polwheveral Creek SW 739 284

DATE 17.6.23
(Plymouth University).

OPERATORS Robin Bradley, Gavin Ingram, Craig Baldwin, Rachel Turnbull

APPROXIMATE AREA NETTED 900 m²

METHOD Seine net hauled by wading. Net 29.5 m' long by 2.0 m' deep. Mesh size approx' 5 mm knot to knot.

WEATHER CONDITIONS

Temperature °C 25

Wind SE Light breeze.

Cloud 4/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 0523 (4.7)

L.W 1204 (0.9)

H.W 1741 (4.8)

WATER CONDITIONS

Temperature °C 22.7

Salinity (‰) 5* (turbid)

Clarity < 0.3m

Surface Smooth

Average depth ~ 1m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1615	1	2.6	1	15.0			1	8.3	1TN	4.5	*Salinity measured using ATAGO S/Mill-E refractometer.
	1	3.0	2	15.2*			1	8.5	1TN	5.9	** Age confirmed by scale reading
	1	3.4					1	9.9	1 TK	6.6	~ 25 common goby @ 4.1 – 4.7cm
	3	3.5							1 TN	7.0	~50 gilthead bream @ 5.1 – 5.9cm + 1 x 18.0 & 1 x 18.6cm
	2	3.6							1 TK	7.2	~ 500 mullet
	2	3.7							2 TN	7.5	Mysids +++
	1	3.8							2 GG	7.7	
	3	3.9							1 TK	8.2	
	4	4.0							1 TK	9.2	
	2	4.2							1TK	9.5	
	1	4.4							1TK	9.6	
									1GG	9.9	
									1TK	9.9	
	21	Ave 3.7	3	15.1							
	Est ~ 180	~ 4									
	Total 201		3		0						

HELFORD BASS MONITORING 2023

SITE No. H20 Head of Polwheveral Creek SW 739 284

DATE 16.8.23
University)

OPERATORS Robin Bradley, George Brew, Rachel Turnbull (Plymouth

APPROXIMATE AREA NETTED 900 m²

METHOD Seine net hauled by wading. Net 29.5 m' long by 2.0 m' deep. Mesh size approx' 5 mm knot to knot.

WEATHER CONDITIONS

Temperature °C 26

Wind N Light breeze

Cloud 3/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 0614 (4.7)

L.W 1255 (1.1)

H.W 1828 (5.0)

WATER CONDITIONS

Temperature °C 24.0

Salinity (‰) 16 *

Clarity < 1ft

Surface Slight ripple

Average depth ~1m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1720	1	5.8			1	18.7#	1	4.0	1	3.6	*Salinity measured using ATAGO S/Mill-E refractometer.
	1	6.1					1	4.3	1	3.9	~ 2,000 sand smelt
	1	6.4					2	4.5	3	4.0	~ 2,000 mullet - mostly smaller ones
	1	7.1					1	5.0	1	4.2	~ 50 gilthead bream @ 8.0 - 11.9cm
	1	7.7					1	5.5	1	4.5	# age confirmed by scale reading
	1	7.8					1	6.1	1 TN	9.3	
	1	8.1					1	6.9	1 TN	9.5	
	2	8.2							1 GG	9.5	
	1	8.3							1 TK	9.7	
	1	8.4							1 TK	9.9	
	3	8.5							1 TK	10.0	
	5	8.6							1 TK	10.1	
	1	8.7#							1 TN	10.4	
	3	8.8							1 TN	10.6	
	6	8.9							1 TN	10.8	
	7	9.0							1 TN	10.9	
	4	9.1							1 TK	11.2	
	3	9.2							1 GG	11.3	
	1	9.3							2 TK	11.5	
	3	9.4							1 TK	11.6	

Bass Investigations in Cornwall 2023

	3	9.5							1 GG	11.7	
	3	9.6							1 TK	11.7	
	4	9.7							1 TK	12.8	
	4	9.8							1 TK	13.1	
	2	9.9									
	1	10.0									
	2	10.1									
	Total 66	Ave 8.9									
Not meas.	305										
	Grand total 371		0		1						

HELFORD BASS MONITORING 2023

SITE No. H2 Bonallack – main channel SW 718 260

DATE 21.8.23
Pinch.

OPERATORS Robin Bradley, George Brew, Ben Harris, Dave Jones, Kevin

APPROXIMATE AREA NETTED N/A

METHOD 30m net held against the tide in the channel below small causeway to the left of farm track for 10 minutes, and brought to N bank x 3.

WEATHER CONDITIONS

Temperature °C 22

Wind S Moderate breeze

Cloud 8/8

Precipitation Nil

Overall Conditions Rating Fair

TIDES (Falmouth BST)

H.W 0852 (4.7)

L.W 1511 (1.1)

H.W 2054 (4.8)

WATER CONDITIONS

Temperature °C 19.4

Salinity (‰) 30 *

Clarity < 1ft

Surface Ripples

Average depth 0.6

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1330#	3	6.0					1	5.0	1	4.5	*Measured using ATAGO S/Mill-E refractometer.
1400##	6	6.5					2	7.0	1 GG	10.0	~ 50 small mullet (4cm approx.)
1430###	5	7.0							1 GG	11.0	2 x gilthead bream @ 10.6cm
	3	7.5							1 GG	11.5	A few common gobies @ 7.5cm
	1	7.6							1 TK	19.0	A few herrings (and occ spratt) @ 6.4cm and 11.1 - 12.1cm.
	1	7.8									Four pipefish ranging from 12.0 - 14.0cm.
	1	8.0									1 scad @ 24cm.
	2	8.3									Some translucent fish @ ~4cm.
	6	8.5									# 1/3 of bass on this run.
	6	9.0									## Net filled with weed and could only be held for 6 minutes. 2/3 of bass on this run.
	1	9.1									### Very little water left at this stage of tide (LW - 40) and only one bass found.
	1	9.5									Tide height about right. Netting from LW - 1h 40 avoids strongest flow and catches bass. Best result at LW - 1h 10. By LW - 40 water gone.
	1	10.0									May be possible to net 50 yards to right of farm track as mud not too bad here and fewer obstructions?
	1	10.5									
	Total	Ave	0		0						
	38	7.9									

HELFORD BASS MONITORING 2023

SITE No. H20 Head of Polwheveral Creek SW 739 284

DATE 13.9.23

OPERATORS Robin Bradley, Bradley Wiffen, George Brew, Nigel Burley
+ Dr Ben Ciotti and Ryan Hepburn from Plymouth University (PU).

APPROXIMATE AREA NETTED 900 m²

METHOD Seine net hauled by wading. Net 29.5 m long by 2.0 m deep. Mesh size approx. 5 mm knot to knot.

WEATHER CONDITIONS

Temperature °C 19

Wind NW Light breeze

Cloud 8/8

Precipitation Nil

Overall Conditions Rating Fair

TIDES (Falmouth BST)

H.W 0515 (4.6)

L.W 1154 (1.2)

H.W 1728 (4.9)

WATER CONDITIONS

Temperature °C 18.0

Salinity (‰) 6 surface, 35 lower *

Clarity < 0.5m

Surface Smooth

Average depth ~1m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1630	1	5.9							1	4.5	*Salinity measured using ATAGO S/Mill-E refractometer.
	2	6.2							1	4.6	~2,000 small mullet
	1	6.3							2	5.0	Occ common goby @~ 4cm
	1	6.4							1	5.1	2 gilthead bream @ 12.7 & 13.0cm
	1	6.7							1	5.2	25 bass ('0' group) kept by PU personnel for research.
	1	7.0							1	5.6	Bass classified by length (and spots). '1' groups typically around 17cm at this time. PU otolith studies should confirm.
	1	7.1							1	15.0	
	2	7.2									
	2	7.5									
	1	7.7									
	2	7.8									
	5	8.0									
	2	8.2									
	3	8.3									
	5	8.5									
	2	8.6									
	1	8.8									
	1	9.0									
	1	9.3									
	1	9.4									

Bass Investigations in Cornwall 2023

	1	9.5									
	1	9.6									
	3	10.0									
	3	10.2									
	1	10.4									
	1	10.5									
	2	10.6									
	2	10.7									
	2	10.9									
	1	11.0									
	2	11.1									
	1	11.5									
	1	11.6									
	2	11.8									
	2	12.0									
	1	12.2									
	1	12.3									
	Tot6	Ave									
	3	9.1									
Not measured	891										
Grand total	954		0		0						

SURVEY REPORTS - North coast

CAMEL BASS MONITORING 2023

SITE No. Trewornan Dam SW 980 742

DATE 15.8.23

OPERATORS Robin Bradley, Eddie Gummow, Ron Davey

APPROXIMATE AREA NETTED 300 sq m

METHOD Haul net up creek along north end of dam once.

WEATHER CONDITIONS

Temperature ° C 21

Wind NW Light breeze

Cloud 4/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 0536 (4.5)

L.W 1217 (1.2)

H.W 1750 (4.9)

WATER CONDITIONS

Temperature °C 22.6

Salinity (‰) 4 *

Clarity <1ft

Surface Smooth

Average depth <1m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1700	1	3.0							1	4.0	*Salinity measured using ATAGO S/Mill-E refractometer.
	1	3.3							1	4.7	With thanks to James Menhennick for allowing access through Burniere Farm.
											~ 200 shore crabs
											~ 50 common gobies (3.5 - 3.9cm)
											Occasional mullet
											1 flounder (6.3cm)
											The configuration of the top of the creek makes it difficult to avoid losing fish, which I think is what happened on this occasion. Could try earlier in the flood, but ? better to haul net at HW, to allow fish to fully enter creek on a tide which only just reaches the head of the creek, and not the sides, so that most of the flood can be covered by the net. Should be about 4.6m.
											The small size of the bass at this time is notable.
	Tot = 2	Ave = 3.1	0		0						

CAMEL BASS MONITORING 2023

SITE No. Trewornan Dam SW 980 742

DATE 28.8.23

OPERATORS Robin Bradley, Eddie Gummow, Ron Davey, Ian Ingram

APPROXIMATE AREA NETTED 300 sq m

METHOD Haul net up creek along north end of dam once.

WEATHER CONDITIONS

Temperature °C 21

Wind NW Gentle breeze

Cloud 7/8

Precipitation Nil

Overall Conditions Rating Fair

TIDES (Falmouth BST)

H.W 0319 (4.3)

L.W 0958 (1.6)

H.W 1549 (4.7)

WATER CONDITIONS

Temperature °C 19.2

Salinity (‰) 4 *

Clarity <1ft

Surface Ripples

Average depth <1m

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1506									1	3.1	*Salinity measured using ATAGO S/Mill-E refractometer.
									1	3.6	With thanks to James Menhennick for allowing access across field before bridge.
									1	3.8	~500 very small mullet @ ~4cm
									1	4.0	~ 50 common gobies @ ~ 5cm
									1	4.4	2 ?Sticklebacks @ 3.2 & 3.5cm
									1	4.7	** ~15 large thick-lip mullet (to ~ 50cm)
									1	6.3	This height of tide is just right. By netting at HW - 40 the tide was far enough in and we were able to cover the whole channel. Fish loss therefore not an issue. The unsettled weather continues and the conditions were not optimal. This may have a bearing on the absence of bass, so difficult to draw conclusions about year class strength.
									1	6.5	
									1	8.1	
									1	8.5	
									1 TN	13.2	
									1 TK	14.0	
									1TN	17.5	
									1 TN	18.0	
Total	0		0		0				**		

GANNEL BASS MONITORING 2023

SITE No. Trevean Way public slipway SW 801 610

DATE 8.9.23

OPERATORS Robin Bradley, Rob Hillman

APPROXIMATE AREA NETTED N/A

METHOD 30 yard net held against the tide for 10 mins x 5 and brought to N bank

WEATHER CONDITIONS

Temperature °C 23

Wind W Light air

Cloud 2/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 1152 (4.0)

L.W 1845 (2.1)

H.W 0041 (3.7)

WATER CONDITIONS

Temperature °C 21.0

Salinity 9 (‰) *

Clarity To bottom

Surface Smooth

Average depth 1-2 ft

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1216	1	5.4							1	2.9	*Salinity measured using ATAGO S/Mill-E refractometer.
1225	1	5.9							1	3.0	This was our first survey at this site. The location, method, tide height and time worked well. With thanks to Rob Hillman for his local knowledge. Also to Paul Pocock for initially showing me around.
1240	1	6.0							1	3.8	Bass on all hauls except the last one. 10+ came on 1300 haul i.e. starting at HW + 1h 8 mins.
1300	1	6.1							1	4.0	~ 500 small (~4cm mullet)
1317	1	6.5							1	4.7	A few common gobies @ 3.9 - 4.9cm
	1	6.6							2	4.9	Occ sand goby @ 5.4, 6.0cm
	1	6.7							1	5.5	Occ lesser sandeel @ 8.0cm, 8.3
	1	7.3							1TK	10.2	1 plaice @ 8.3cm
	2	7.4							1GG	10.7	
	1	7.5							1TK	15.0	
	1	7.6									
	1	8.2									
	1	8.5									
	1	10.0									
	1	10.3									
	Tot 16	Ave 7.3	0		0						

CAMEL BASS MONITORING 2023

SITE No. Rail Bridge Pool SW 927 742

DATE 4.10.23

OPERATORS Robin Bradley, David Wilson + Ryan Hepburn and Raj Mathius from Plymouth University.

APPROXIMATE AREA NETTED 170 sq m approx

METHOD 20m net drawn through pool under bridge.

WEATHER CONDITIONS

Temperature °C 16

Wind SW Moderate breeze

Cloud 8/8

Precipitation Nil

TIDES (Falmouth BST)

H.W

L.W

H.W

WATER CONDITIONS

Temperature °C 16.9

Salinity (‰) 38 *

Clarity < 1ft

Surface Ripples

Average depth 1m

Overall Conditions Rating Poor - windy in tunnel under bridge

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
									1	3.4	*Salinity measured using ATAGO S/Mill-E refractometer.
									1	5.0	~2,000 small mullet
									2	5.1	+++ Prawns @~6.5cm
									1	5.3	No bass. The pool was as it was when DK did ths site, and we drew the net from the bridge stanchions towards Padstow as per his method.
									1	5.6	Accessing the site is difficult due to the steep embankment.
									1	6.1	The 20m net is far too long.
									1 TK	11.4	I'm sure we would have netted any bass present. Did the windy & cool conditions affect the result? But water was above 16 (min according to DK). There were plenty of mullet there. Some of these were larger mullet, so did this inhibit any bass from being stranded in the pool?
									1 TK	13.4	
									1 TK	13.5	
									1 TK	14.0	
									1 TN	14.1	
									1 TK	14.7	
									1 TK	15.5	
Total	0		0		0				1 TK	20.0	

GANNEL BASS MONITORING 2023

SITE No. Trevean Way public slipway SW 801 610

DATE 6.10.23
(Plymouth University)

OPERATORS Robin Bradley, Rob Hillman, Ben Harris, Ryan Hepburn

APPROXIMATE AREA NETTED N/A

METHOD 30 yard net held against the tide for 10 mins x 7 and brought to N bank

WEATHER CONDITIONS

Temperature °C 20

Wind SW Gentle breeze

Cloud 1/8

Precipitation Nil

Overall Conditions Rating Good

TIDES (Falmouth BST)

H.W 1015 (4.4)

L.W 1703 (1.9)

H.W

WATER CONDITIONS

Temperature °C 15.0

Salinity 20 (‰) *

Clarity To bottom

Surface Smooth

Average depth 1-2 ft

Time	Bass:- year class & total length						Sand smelt		Mullet		Other Bass, Fish & Remarks
	2023		2022		2021		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1020	1	6.6					1	3.8	1	4.2	*Salinity measured using ATAGO S/Mill-E refractometer.
1035	1	7.4					1	4.0	1	5.0	Bass came on last two runs
1100	1	7.5					1	4.6	1	5.1	~200 small mullet and sand smelt
1122	1	7.6					1	5.5	2	5.4	~ 25 lesser sandeel @ 7.9, 8.0, 8.2, 8.4, 8.8 11.5cm
1140	1	8.2					1	5.9	1	5.7	Occ common goby @~ 5cm
1200							1	6.0	1	6.0	
1225							1	6.3	1	6.2	
							1	6.5	1	6.4	
									1 TK	10.8	
									1 TK	11.2	
									1 TK	12.0	
									1 GG	12.0	
									2 TK	12.5	
									1 TK	12.7	
									2 TK	13.0	
									1 TK	13.2	
									1 TK	13.8	
									1 TK	14.3	
									1 TK	15.0	
									1 GG	18.6	
									1 TK	19.6	

Bass Investigations in Cornwall 2023

									1 GG	20.6	
									1 TK	22.6	
									1 GG	26.2	
									1 GG	26.6	
	Tot = 5	Ave = 7.5	0		0						