Bass Investigations

In the Fal and Helford (& Camel)

Marine Special Area of Conservation

Report for the year 2022

Robin Bradley

Since 2021 this report has been produced by Robin Bradley in conjunction with, and based on the templates previously used by, Derek Goodwin. It is based on information collected in a voluntary capacity by a team of voluntary workers, to improve the understanding of the status of juvenile bass within the Fal and Helford Marine SAC (and recently the Camel estuary).

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.

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SUMMARY
New tables showing catch per survey (cps) and growth have been included in this year's report.

In the Fal, catches of '1' groups were very poor, with just 38 found in 11 surveys, giving a cps of 3.5. Catches of '0' groups were also very poor, with just 39 found in 5 surveys during August and September, giving a cps of 7.8.

In the Helford, catches of '1' groups were poor, with 162 found in 5 surveys (155 of these in one catch) giving a cps of 32.4. Catches of '0' groups were also poor, with 57 found in 2 surveys during late July and August, giving a cps of 28.5.

In the Camel, catches in the Camel were poor, with just 2 bass, both '0' groups, found in 2 surveys during August and September. We are still developing our approach to these sites, so no conclusions can be drawn from this year's results.

Taking all things into account (see Section 8), our conclusion for **the strength of the 2021 class is fair/reasonable.** There is some uncertainty over conclusion, due to the pattern of results obtained, so it will be interesting to see if other surveys and future catches bear this out.

Our initial conclusion for **the strength of the 2022 class is poor.** This conclusion will be confirmed when the data for '1' groups is available next year.

For the first time, we have been able to compare results with surveys in other parts of the UK on a real-time basis. It would appear that catches of '0'groups have been poor in the southwest, but much better in the east of England.

The initial size of '1' groups was good, suggesting good growth of the 2021 class in its first year. The growth of '1' groups in 2022 for the Fal looks reasonable, but not exceptional. This is surprising, given the very warm summer we had this year, but might have looked better if we had been able to measure them beyond August. Difficult to assess growth in the Helford since '1' groups could only be measured to 16/6/22.

The Initial '0' group size in 2022 was good, but it is difficult to assess subsequent in year growth as we were unable to measure any '0' groups beyond August.

To ensure the continued effectiveness of the survey programme, additional boat cover is required, and the consolidation/development of additional sites which do not require this must continue.

If the survey work is to continue, alternative funding sources to cover part/all of equipment costs and expenses must be found.

We have developed our weather and water temperature monitoring arrangements so that survey findings can be understood in the context of recruitment drivers.

The inclusion of data from the scheme in scientific papers is very encouraging, and we hope that we can continue to contribute to research and the understanding of bass recruitment.

1. PERMISSIONS

Cornwall IFCA (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.

Each survey is notified to Simon Cadman, CIFCA Principle Enforcement Officer, in advance. Also, to Sally Gallop, Technical Fisheries Officer at the Environment Agency, and Mark Killingback, Truro Harbour Master.

Duchy of Cornwall

The Duchy own 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.

2. PERSONNEL

Every opportunity, including the use of social media, is taken to recruit additional volunteers. For communications, we have a ‘WhatsApp’ group, which currently includes 21 participants. In addition, we have a further 8 volunteers who are contactable by email - some of these primarily help with the Camel surveys.

3. EQUIPMENT

Nets

The main net used is a 30-yard long freshwater beach seine constructed on No 2 by 10mm white knotless nylon netting with 8mm head rope with floats and 12 mm leaded ground rope Net depth to fish 7 feet in the bunt. This was the quotation from Net Work Services, and the net was purchased in 2005. In practice the net was found to be nearer 29.5 metres long and 2 metres deep and poles were fitted at the ends of the net after purchase. Measuring the mesh size it was approximately 5 mm knot to knot which equates approximately to 10mm mesh size. No cod end was fitted to avoid crowding casualties

A net similar to the above but only 18.3 metres long by 1.8 metres deep and mesh size approximately 5 mm knot to knot is very occasionally used for exploring or when there is a real dearth of helpers. When this net is used, it is noted in the catch report and summaries.

This year D Goodwin has rigged up a third net, approx. 10 x 2m of the same material and mesh size as the other nets. This is useful for netting small pools, such as at Polingey Creek (first used 19.8.22).

Other Equipment
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 a bucket. On hot days, the fish are measured before any further hauls, as increased water temperature can lead to casualties. Once measured, the fish should be discarded downstream. A battery operated digital thermometer is used for measuring water temperature with a spare traditional thermometer kept and used as a check. This is also used to measure the air temperature.

From 27.6.22 salinity was measured using a Tecpel 850 Salinity Meter. This was passed to us by Tony Hooper, who had been using the meter for juvenile bass surveys in the Tamar and Yealm in 2012. The meter was funded by BASS. The meter was checked with a 1% (i.e.10g/l) solution prepared by RB and found to be accurate. In practice, readings tended to be erratic at times, and where uncertainty exists the reading has been recorded (on the survey sheets) with a question mark. The readings have not been included in the bass catch summaries in this report. Unfortunately. The meter suffered water damage and could not be used after 26.8.22. It is considered that salinity measurements would provide useful additional information, so a new meter will be purchased for next year's survey programme.

An 'L' shaped piece of wood with tape measure attached is used to measure the length of fish. The markings had become increasingly indistinct, so the tape was replaced. During the course of the year Tony Hooper donated a short piece of white half-round plastic guttering, with end stop and tape attached. This makes an excellent measuring device and is used routinely now.

Steve Colclough demonstrated a Perspex fish-measuring device incorporating a tape, whereby the fish can be observed swimming and measured at the same time. While this allows the fish to be seen in a more natural state e.g. with fins erect, measurement may not be as easy, especially when dealing with a number of specimens which need to be processed quickly.

To measure the depth of water, a stick marked every six inches can be used. 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 exploring shallow creeks, and capable of resting on dry sand/mud at low tide, is needed for access to Ruan and Lamorran on the Fal, and at Bonallack 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 dingy is needed for certain sites e.g. Lamorran. A Honda 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. A useful fitting for the main boat is a sonar/GPS.

4. INSURANCE

Our current insurers, J R Stephens Insurance Consultancy (Perranporth), advise that Public Liability cover up to £5,000,000 is needed, and this is required by the Duchy of Cornwall. Any volunteers using their own boat for surveys must have the same level of cover, and notify their insurers of their involvement in the surveys, including conveying volunteers to sites.

Our insurers also advise that Employers' Liability cover is required, to a minimum value of £5,000,000.

5. 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. This also includes general information, such as the purpose of the work.

For safety equipment, inflating lifejackets are carried in the boat together with flares, first aid kit and of course mobile phones. The depth of water in the sites is mostly 1 metre or less so chest waders can be used or wet suits. Secure footwear must be worn to avoid this coming loose in mud. A light "heaving line" is kept handy if needed to help anybody out of the mud. So far not been used.

RB attended a RYA First aid course in February provided locally by Falmouth Training Solutions.

6. 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.

There are running costs to be met, including insurance and fuel costs where a boat is used for surveys, and equipment costs.

Insurance (see section 4) costs for the scheme amount to £380. 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 by the Duchy of Cornwall, this would typically cost £40-50pa.

Fuel costs for boats is 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 £30 at current (Nov 22) prices. Travelling to the Helford sites from the same launching area would use about 22 litres - over £42 worth.

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.

It is not reasonable to expect volunteers to cover survey-related insurance costs and boat fuel costs, or equipment costs. These are currently borne by DG/RB or individual boat owners. However, this is not sustainable, and if the survey work is to continue, alternative funding sources must be found to cover part/all of these costs.

7. SITES AND METHODS OF NETTING

Sites netted on the Helford 2022.

No 20' Head of Polwheveral Creek. OS Position 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. Netting can be started in May and continued until early September but by the end of August small bass have not been found in any numbers. 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. Stop netting was tried in the stream on a **rising tide** without success. 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 5.0 metre 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.

No' 12 Merthen. SW 727 258
This site can be very productive and usually there is a more diverse range of species than other sites. It is netted on a low water spring tide that drains from the site. A boat is needed to get to the site, and there is a need to arrive early. Best results so far have been two hours before low water, but it may be worthwhile to try sooner. Low water spring tides are always at about noon GMT, and perhaps netting the incoming tide may be more productive with the warmer water. With a tidal range of five metres or more the flood tide is strong, making it difficult to hold the net and it quickly floods the site. It is worth the try after netting the ebb tide as the flood tide comes in about thirty minutes after low water. Best results have been when the tide drains from the site, and the height of tide low water is no more than 0.6 metres.

The site is a difficult one to work as the River is far too wide for the net to span it, but it is worth the effort. From the entrance of Mawgan Creek and downstream the River splits into some side channels as well as maintaining a main channel. The mud is worst nearest the River banks, and to date netting has been worked from the South shore where the mud is difficult but negotiable. The River bed is fairly firm shingle sand and mud, but there are difficult mud shoals. Ideally the site should be "explored" at low water to find the best places to work and run the net out. The net is hauled out in to the River as far as possible by wading, preferably where there is a shallow side channel. One end is held ashore and the net held against the tide for ten minutes or less, then hauled ashore. The catch is sorted, bass are kept

in buckets with an aerator, and the process repeated until the tide has left. If large numbers of bass are caught they are counted and returned down tide of the net. In which case no netting is made on the flood tide.

No' 2 Bonallack – main channel. SW 718 260
We were unable to survey this site in 2022. For a detailed description of the site please see the 2018 annual report.

Sites Netted on the Fal 2022.

No' 13 Ruan Creek SW 867 405
A boat is needed to reach this site and it is best netted in the afternoon on a falling tide. Ideally when the height of the tide at low water is about 1.0 metres and timed about 1600 to 1700. The tide drains from the site and returns about 30 to 45 minutes after low water. Heights and times of tides from Falmouth tide tables.

The River bed here is mostly firm sand and mud, but in general the nearer the River bank the more difficult the mud can be, particularly on the North side. There are very few occasional snags to foul the net in the River bed, mostly broken tree branches.

Netting is done from the South shore and one end of the net is hauled out into the River as far as possible by wading and the other end held ashore. It is then held against the tide for ten minutes and hauled back to the South shore in a J pattern. The catch is held in the water as best as possible and sorted with the bass kept in buckets with aerators for measuring and recording, and other fish returned. Some other fish may be kept briefly in buckets for measuring, recording and identifying. The process is repeated until the tide has left, and if too many fish or bass are caught to keep alive in the buckets they are counted, recorded and returned down tide of the net. Especially if the bass catch has been poor it may be worthwhile to net the flood tide, as this can help confirm any scarcity of small bass.

No' 15 Lamorran Gully SW 884 417
A boat is needed to reach this site, and it is best netted in the afternoon on a spring tide about two hours before high water. It should be netted when the height of tide at high water is between 4.5 to 5.0 metres. Any lower than 4.5 metres it may not flood the mudflat or sufficiently flood the gully. Any higher than 5.0 metres and the tide may flow too strongly, but could be worth trying. Need to allow at least 2 hours before high water to be on the site, especially on a 5.0 metre or higher tide.

The mud here in the broad mudflat is firm, but slippery especially on the sides of any gullies. Mostly the mud at the site and in the gully is reasonably firm and negotiable with some "difficult" patches, and there is shingle on the North shore. It is difficult to transport the net to the point where it is intended to net and this is where the small inflatable dinghy is useful.

The net is hauled through the gully with the incoming tide for a distance of about 70 metres before the tide floods the mudflats, and completely fills the gully. This requires some judgement and observation to be reasonably sure fish have moved up the gully and they have not spread out at the end of the gully. At the end of the haul the net is landed to the North shore. The main problem here is the soft mud collected in the net.

An alternative method which works quite well is to hold the net across the gully against the incoming tide for about 10 minutes and hauling the net to the North shore under the trees about halfway along the gully. This method is best on a tide of 5.0 metres or more height. Using this method there is no problem with mud in the net. Any bass are kept in buckets and the process repeated for as long as considered necessary or possible. It should be noted in all cases that when too many bass are caught to keep in buckets the rest are counted and returned. As the fish intend to move up the gully and the water is reasonably clear it is worthwhile to stay out of sight under the trees and avoid any disturbance until it is time run the net out.

Penpol Creek SW 812 390
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 is prevalent. Several tears to the net occurred. It was suggested by an onlooker at one of our surveys that we net the pool by the bridge at the top of the creek at low water.

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.

Ben Harris, with a '1' group bass from Penpol Creek in August. Note the new fish length recorder.

Polingey Creek 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. On the S side of the creek, a pool (~200 sq. m) is revealed by the falling tide about 2 hours into the ebb.

The site was netted on two occasions from HW by holding the 30m net against the tide just above causeway for 10 minutes before drawing to the N bank, and then by drawing the 10 x 2m net through the pool on the S side 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. This seems to be a useful site.

Polingey Creek looking towards the south bank.

Gorrangorras Creek (in Penryn River) SW 793 345

The entrance of the creek is rock on the W shore and a bar of sand and shingle extends from E shore. This leaves a narrow entrance channel, where there are stepping stones and a shingle bottom. The entrance is netted by holding the net against the incoming tide (15 – 20 mins) just above the stepping stones.

DG surveyed this site some years ago (see 2001 report). FVV had a catch of 290 ‘0’ groups on 16.9.16 at LW+2 on a 5.4m tide. The site was also netted on 4.8.13 at LW+2.5 on a 4.7m tide, when a catch of 137 ‘ 0’ groups was made. This seems to be a useful site.

Rob Taylor with a ‘1’ group at Gorrangorras in June

Sites netted in the Camel 2022

Year class strength can vary between the north side of the Cornwall peninsula and the south, 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 (2) on the Camel. We are still developing our approach to these sites, so no conclusions can be drawn from this year’s results.

Trewornan Dam SW 988 743
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. DK notes that a small to medium tide is best, but the 4.3m tide we chose was not high enough to fill the creek adequately.


Waiting for the tide to fill the creek at the N end of Trewornan Dam.

Rail bridge Pool
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. The position of the pool may change from year to year, and the best method and timing are still being worked through. DK notes that it is very productive in September.

We were joined by Donovan's son David for a survey here in September. We look forward to working with him again next year.

David Kelley at the Rail Bridge Pool site in September.

Survey considerations

The survey programme was impacted by the limited availability of boats to access proven sites. Of the 18 surveys we conducted, we were only able to use boats on 4 of these, all in Jon Williams' boat, meaning that access to traditional, proven sites was limited. This was particularly the case with the '0' group surveys, where only 1 boat-based survey, at Ruan on the Fal, was carried out.

Options for the availability of boats for 2023 look slightly better, with Frank Van-Veen (Helford) having now replaced his boat, and a possibility that Tim Rogers (Fal) will be able to help with his boat, in addition to continued support from Jon Williams.

Efforts to ascertain the feasibility of accessing the Lamorran site on foot came to nought due to an inability to contact the Landowner.

While continuity of results is important, there is a need to introduce new, or reintroduce previous sites which are viable, in order to keep the programme going in the absence of sufficient boat help.

Efforts to establish reliable sites on the Fal, which don't require a boat to access, continue. Surveys were carried out at Penpol, Polingey and Gorrangorras. The method and timing for Penpol seems to have become established, and it looks like becoming a regular site; even in a poor year it has produced '0' groups. It has been suggested that we also try the pool by the bridge at the head of the creek at low water.

Polingey and Gorrangorras have both produced good catches in the past, but were discontinued in favour of boat-based surveys. We will continue to develop and fine tune the method used and timing.

Method development

Steve Colclough from the Institute of Fisheries Management came down from Kent to deliver an interesting and informative talk, "Fish Ecology in Estuaries and Saltmarshes", on Thurs 25th August at the Tremough Exeter University campus near Falmouth. This was organised by RB in conjunction with the Helford Marine Conservation Group, and supported by BASS.

Steve joined us on a survey at Polwheveral the following day, and brought along some of the equipment he uses. His main net is a little smaller than ours at 13x37m, and has a finer mesh (3mm). Steve showed us a Fyke net. He had explained in his talk that the fish swim over this on the flood tide, but because they swim on the bottom on the ebb, they get funnelled into the net as they leave the site. The Fyke net needs to be left for several hours.

Steve also demonstrated his intertidal net, which can he held across a narrow channel, before lifting from the bottom. He also demonstrated a perspex fish measuring/viewing device he uses.

We need to consider what additional information these tools will give us and how/where they can be deployed in our surveys.

Fyke net

Intertidal net

Steve Colclough demonstrating his perspex measuring/viewing device to Derek Goodwin. Photo credit: Craig Baldwin.

Recording

Temperatures were taken using a digital thermometer and a standard thermometer as a check.

A measuring stick with white disc attached to the bottom can be used to measure depth and water clarity. In practice depth is estimated when wading, and clarity from visual assessment.

The total (i.e. not fork) length of fish is measured to the nearest mm (0.1cm). See above, under 'Other equipment' for equipment used.

In the 1996 Annual Report (Helford) it was noted (4.9 on p8) that "salinity was not a factor in attracting juvenile and '0' group bass, although, of course, there could be an attraction for the freshwater inflow" Salinity measurements were not taken in the 1996 surveys, nor have they been until this year.

Measuring salinity was commenced from 27.6.22, but had to be discontinued after 26.8.22 due to equipment problems (see under 'Other equipment'). Steve Colclough feels it is important to measure salinity on juvenile fish surveys in estuaries, so we will continue with them in 2023 once new equipment is in place.

Bass Age Assessment and growth

Age assessment for the bass "O" group and the one year olds is usually straightforward from their length. They first enter the nurseries in July when they are about 3 cm total length and they do not have full pigmentation until towards the end of July. They usually attain a total length of about 8 to 11 cm in September. In the following year, they will be caught in May with a total length about 8 to 11 cm but this could be less depending on their growth in Summer, and Autumn, and after a harsh Winter. They could then grow to about 15 cm total length by the end of August. Fish caught in May at 15 cm or more in length are 2-year-old bass. Bass caught more than 20 cm total length may need to be aged by taking scale samples and this is done by D.C. Goodwin/ R Bradley, and if necessary checked by Cefas. Post larval bass do have what Donovan Kelley calls a "spotty phase" After they have become fully pigmented they display fairly distinctive spots on both sides. These can still be discerned by the end of the following May, and usually disappear by the end of their first year in the nursery. This is another help in age assessment.

In 'Age Determination in bass and assessment of growth and year class strength' J Mar. Biol. Ass UK (1988), 68, 179-214, Donovan Kelley notes (p193) "A broad indication of year-class strength can also be gained, after the first 'birthday', from the amount of growth made in year 1. On the west and south coasts, good growth is positively correlated with a strong brood, poor growth with a weak one."

This year's report includes an analysis of growth. Data for the current year, and for previous years back to 2000 are included in new tables V and VI.

The initial size of '1' groups was good in 2022 compared to other years for Helford and Fal, suggesting good growth of the 2021 class in its first year.

The growth of '1' groups in 2022 for the Fal looks reasonable, but not exceptional. This is surprising, given the very warm summer we had this year, but might have looked better if we

had been able to measure them beyond August. Difficult to assess growth in the Helford since ‘1’ groups could only be measured to 16/6/22.

The Initial ‘0’ group size in 2022 was good compared to other years for Helford and Fal, but is difficult to assess subsequent in year growth as we were unable to measure any beyond August.

With thanks to Peter Maddern for preparing the above photo compilation

Tables Summarising Catches & growth

It should be noted that as the catches have to be sorted and released quickly it is not always possible to properly identify and count other species, especially if the catch is large. For more detail the catch reports in the appendices should be examined.

Table I Summary of Fal Bass Catches 2022

Table II Summary of Helford Bass Catches 2022

Table III Summary of Camel Bass Catches 2022

Table IV Catch per survey – Fal and Helford

Table V Bass growth - Fal

Table VI Bass growth - Helford

Table VII Summary of Other Species Caught in the Fal 2022

Table VIII Summary of Other Species Caught in the Helford 2022

Table IX Summary of Other Species Caught in the Camel 2022

Table I FAL BASS CATCH SUMMARY 2022 Key: TL = "Total length" in centimetres.

Date	Site	BASS								WATER			WEATHER			General Conditions
		2022		2021		2020		Other Yr Class		Temp °C	Depth (m)	Area Sq m	Air °C	Wind	Cloud & Rain	
		No.	Ave TL	No.	Ave TL	No.	Ave TL	No.	Year							
5.5.22	Ruan Creek	0		0		0		0		15.2	0.8	-	19	WSW F3	5/8 Dry	Good
16.5.22	Penpol Creek	0		1	12.5	0		0		20.0	0.5	600	16	S F4	6/8 Dry	Fair
30.5.22	Penpol Creek	0		1	13.2	0		0		19.0	0.5	600	14	NW F3	4/8 dry	Good
1.6.22	Gorrangorras	0		3	12.2	0		0		18.7	0.3	Not Known	15.5	SW F3	6/8 Dry	Good
13.6.22	Penpol Creek	0		0		0		0		23.2	0.5	600	22	NNW F3	3/8 Dry	Very good
27.6.22	Lamorran	0		10	12.1	0		0		22.0	0.3	2,000	18	SW F4	6/8 Dry	Fair
3.8.22	Ruan Creek	0		21	16.4	0		0		21.2	0.8	-	23.5	SW F4	2/8 Dry	Good
12.8.22	Penpol Creek	25	8.0	2	17.2	0		0		25.7	0.5	600	27.0	ENE F3	0/8 Dry	Very good
19.8.22	Polingey Creek	1	9.0	0		0		0		22.1	<1	200	22	WSW F4	4/8 Dry	Good
29.8.22	Penpol Creek	13	9.8	0		0		0		23.7	0.5	600	24	ENE F3	5/8 Dry	Good
6.9.22	Polingey Creek	0		0		0		0		19.8	< 1	200	17	S F4	7/8 Showers	Poor
Totals		**39**		**38**		**0**		**0**								

Table II HELFORD BASS CATCH SUMMARY 2022 Key: TL = "Total length" in centimetres.

Date	Site	BASS								WATER			WEATHER			General Conditions
		2022		2021		2020		Other Yr Class		Temp °C	Depth (m)	Area Sq m	Air °C	Wind	Cloud & Rain	
		No.	Ave TL	No.	Ave TL	No.	Ave TL	No.	Year							
14.5.22	Polwheveral	0		0		0		0		18.7	~1	900	18	ENE F2	2/8 Dry	Good
19.5.22	Merthen	0		155	12.2	0		0		15.5	Tidal	Net held against tide.	15	SSW F3	3-4/8 Dry	Good
16.6.22	Polwheveral	0		7	13.9	1	24.7	0		22.2	~1	900	22	ENE F3	7/8 Dry	Good
28.7.22	Polwheveral	39	7.6	0		0		0		28.0	~1	900	25.5	SW F2	4/8 Dry	Very good
26.8.22	Polwheveral	18	6.9 & 10.4	0		0		0		24.9	~1	900	30.0	NNW F2	4/8 Dry	Good
Totals		**57**		**162**		**1**		**0**								

Table III CAMEL BASS CATCH SUMMARY 2022 Key: TL = "Total length" in centimetres.

Date	Site	BASS								WATER			WEATHER			General Conditions
		2022		2021		2020		Other Yr Class		Temp °C	Depth (m)	Area Sq m	Air °C	Wind	Cloud & Rain	
		No.	Ave TL	No.	Ave TL	No.	Ave TL	No.	Year							
8.8.22	Trewornan Dam	2	6.3	0		0		0		25.6	< 1	300	22	NW F3	0/8 Dry	Very good
16.9.22	Rail Bridge Pool	0		0		0		0		18	<1	?	15	NNW F4	4/8 Dry	?Poor
Totals		**2**		**0**		**0**		**0**								

Table IV CATCH PER SURVEY – FAL & HELFORD

	Fal			Helford			Fal			Helford			Notes
Year	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	
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 'O' 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."

The recruitment index graph shows recruitment above the geometric mean for 2001 - 2007.

TABLE V BASS GROWTH – FAL

Year	First Ave length of '1' group	Last Ave length of '1' group	First Ave length of '0' group	Last length Ave 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
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 VI BASS GROWTH – 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
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 VII Summary of other species caught in the Fal 2022

Site & No. Dates and Number of times netted	Mullet		Flounders		Gobies	Sand smelt	Others
	Less than 10cm	More than 10cm	Less than 5cm	More than 5 cm			
Ruan Creek 5.5.22	100	12 (GG)		1	100	400	~ 5 crabs. One sand prawn (Crangon crangon). Dwarf seagrass seen.
Penpol Creek 16.5.22	100	500			A few	~75	A few small herring and crabs.
Penpol Creek 30.5.22	100	50				~125	
Gorrangorras Creek 1.6.22	100	100				~100	
Penpol Creek 13.6.22	200	50	1		Occ	50	Occ herring and crab
Lamorran 27.6.22					A few		~50 ~3cm ? herring ? smelt
Ruan Creek 3.8.22	~50 various sizes				A few		~200 smelts (4.0 – 7.-cm). Occ. herring.
Penpol Creek 12.8.22	1,000						A few crabs.
Polingey Creek 19.8.22	700						Occ. crab. A few prawns.
Penpol Creek 29.8.22	~1,000 various sizes					~100	~50 crabs
Polingey Creek 6.9.22	~200						Numerous crabs. Occ. prawn

Table VIII Summary of other species caught in the Helford 2022

Site & No. Dates and Number of times netted	Mullet		Flounders		Gobies	Sand smelt	Others
	Less than 10cm	More than 10cm	Less than 5cm	More than 5 cm		~100	
Polwheveral 14.5.22	~ 5,000	Some					
Merthen 19.5.22	~1,000	Some	1	1	A few	A few	A few crabs, occ herring. 1 Dover sole. 1 pipefish.
Polwheveral 16.6.22	~100	Some			A few	~200	
Polwheveral 28.7.22	~5,000	Some					~ 100 gilthead bream
Polwheveral 26.8.22	~5,000	Inc. in previous col			A few	A few	1 sardine. A few crabs.

Table IX Summary of other species caught in the Camel 2022

Site & No. Dates and Number of times netted	Mullet		Flounders		Gobies	Sand smelt	Others
	Less than 10cm	More than 10cm	Less than 5cm	More than 5 cm		~100	
Trewornan Dam 8.8.22	~200	~50					
Rail Bridge Pool 16.9.22	~200	Inc. in prev. col.			Occ		~ 200 prawns

8. DISCUSSION & CONCLUSIONS

Weather 2021/2022

With climatic conditions playing such an important part in first-winter survival, and spawning and settlement success, an attempt was made to track the weather and water conditions over the winter and into the summer. Data was obtained on a daily basis from timeanddate.com and seatemperature.org (Falmouth), and from ad hoc water temperature measurements at Loe Beach in the Fal, and at Helford Passage in the Helford. It is hoped that continuous water temperature data from F-POD acoustic loggers deployed in the Fal, and potentially a WATR water quality monitor to be deployed in the Helford, will also be available this winter.

In 'Life with bass' (Winters of discontent), Donovan Kelley notes that bass which have not grown to 6cm by the start of winter spells of cold weather lasting more than 4 weeks are unlikely to survive. In "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, p1144 it states: "The warmed water can enhance their growth and, in winter, may provide a refuge from temperatures <6 or 7°C which may kill first year bass." It is unclear what level and duration of air temperatures would lead to these low temperatures, but in "Bass investigation in 1997" – report, Donovan Kelley notes that water temps in a shallow estuary have been found to correspond closely with air temps.

Overnight low air temperatures and water temperatures were slightly above normal last winter. There were no prolonged very cold spells, and winter '0' group losses should have been minimal.

A good spawning year is thought to be associated with relatively strong and homogeneous westerlies, but in poor spawning years, average winds are more variable with no particularly clear directionality or strength* Winds were variable in direction and strength in February & March, the key spawning time in the southwest. There were no sustained periods of strong easterlies at this time, as was seen in 2018, a poor year class in Cornwall.

Average air temperatures were the same as the long-term mean in January, 1°C higher in March, April, May, June and Sept, and 2°C higher in July and August. New UK daytime (40.3°C) and night (25.9°C) temperature records were set in July. Cefas reports (29.9.22) that data provided by WaveNet shows that sea temperatures across the south and east of England hit record breaking levels, likely due to the extremely warm summer. Settlement in the northern stock is highly correlated with temperature with poor settlement in cold years*

July was also the driest on record in southern England. Since the Fal and Helford are rias, and receive low freshwater input, it is unlikely that this will have affected settlement or growth.

The absence of a clear directionality or strength of wind may have reduced settlement, but increased temperatures (air and water) would be expected to have reduced the pelagic phase of this, thereby increasing settlement, and to have increased increased summer growth.

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

Catches

Summaries of catches for the Fal and Helford are listed in tables I and II. This year's report contains a new table (IV) giving catch per survey (cps) information since 2000 for Fal and Helford. A retrospective comparison between year class conclusions (taken from Annual Report summaries) and cps values, shows

that a cps value of >50 for both sites has usually resulted in a 'good' conclusion. Exceptions to this are 2013 and 2017 which were described as 'poor/not very good' despite having cps values of well above 50 for both estuaries.

A comparison between our year class conclusions and data from the Cefas Solent Survey shows some divergences (e.g. for 2001, 2004-6, 2013, 2018). Interestingly these all involve the Solent survey finding more positive outcomes. Regional variation is possible due to wind direction etc. at the time of spawning and the movement of larvae towards the coasts and estuaries.

Catches in the Fal

Catches of '1' groups were very poor, with just 38 found in 11 surveys, giving a cps of 3.5. Catches of '0' groups were also very poor, with just 39 found in 5 surveys during August and September, giving a cps of 7.8.

Catches in the Helford

Catches of '1' groups were poor, with 162 found in 5 surveys, giving a cps of 32.4. 155 of these were found in one catch, at Merthen on 19.5.22. Catches of '0' groups were also poor, with 57 found in 2 surveys during late July and August, giving a cps of 28.5.

Catches in the Camel

Catches in the Camel were poor, with just 2 bass, '0' groups, found in 2 surveys during August and September. We are still developing our approach to these sites, so no conclusions can be drawn from this year's results.

Catches – other species

Many small (<10cm) mullet were seen on several surveys. At Polwheveral on the Helford, 3 of the 5 surveys produced approximately 5,000 of these, with a 4th survey producing approx. 1,000. Penpol on the Fal produced approx. 1,000 on 2 occasions.

100 juvenile gilthead bream were found at Polwheveral on 28.7.22.

Conclusions

The programme of surveys is inevitably affected by the limitations under which we operate (access to boats, availability of volunteers, weather, illness etc.), and the number and mix of surveys which can be carried out. Although conclusions about year classes are primarily based on the results obtained, these limitations, and other factors, must be taken into account.

Our conclusions are therefore indicative only, and should be viewed in conjunction with other surveys, taking into account the possibility of regional variations in recruitment drivers, and with fishing catches.

Strength of the 2021 year class

'0' group numbers in 2021 were modest, with the exception of a very good result (1,195) on the Fal at Lamorran on 3.9.21.

'1' group results in 2022 have been very low, with the exception of a good result (155) on the Helford at Merthen on 19.5.22. We have a reasonable degree of confidence in these results, since we were able to

survey proven sites on both the Helford and the Fal on several occasions in the first part of the programme, when we are mainly looking for last year's fish.

The loss of significant numbers of fish during the winter is unlikely due to the absence of long, very cold spells.

Growth of 2021 fish in their first year seems to have been good. According to Donovan Kelley (see 'Bass Age Assessment and growth' section) good growth in year 1 is associated with a good year class.

Taking all these factors into account, our best estimate is that the **2021 class is fair/reasonable**. This is supported by anglers' catches such as those of Dave Jones and Dr John Tisdale, who report lots of ~15cm bass in the Percuil and Fal rivers respectively this summer. Tony Moore also reports large numbers of hand-sized bass (~18cm) in the Camel this summer. These fish are likely to be '1' groups. There is some uncertainty over this estimate of year class strength, due to the pattern of results obtained, so it will be interesting to see if other surveys and future catches support this.

Strength of the 2022 year class

With '0' group catches so low in both Fal and Helford, **our initial conclusion for the strength of the 2022 class is poor.** This conclusion will be confirmed when the data for '1' groups is available next year.

We were able to survey Polwheveral, a very reliable site on the Helford, twice during July and August. It would have been useful to survey either Merthen or Bonallack as well, but this was not possible. Despite this, based on the Polwheveral results, it is possible to be reasonably confident about the year class conclusion for the Helford.

We conducted 5 surveys on the Fal during August and September. This included one at Ruan Creek, a proven site, which gave zero '0' groups. Two surveys at Penpol Creek gave 25 and 13 '0' groups respectively. The familiarity with, and degree of confidence in this site is growing, and these catches would seem to give a reasonable indication of '0' group numbers in general. Polingey Creek was surveyed twice. One of these was in poor conditions, so no firm conclusions can be drawn. The other survey gave 1 '0' group bass and ~700 small mullet, so it is likely that if more '0' groups had been present we would have caught them.

It would have been useful to survey Lamorran, a very reliable site on the Fal, but this was not possible. Despite this, it is possible to be fairly confident about the year class conclusion for the Fal.

Niel Clark, who fishes the Fal and Helford, reports seeing very few of the very small bass (? '0' groups) this summer.

Settlement seems to have been better in other areas. James Ware took this photo of 'whitebait', including '0' group bass and smelt, being herded onto the shore by mackerel in the Chichester area this summer.

‘0’ group bass (from 2 cohorts) and ?smelts from Sussex. (Photo credit: James Ware)

The Thames Estuary Partnership found 171 ‘0’ groups at Barking Creek on 1.9.22. Essex University found abundant ‘0’ groups in Sussex and Chichester Harbour, but didn’t find any at all in the Severn and only low numbers in the Exe and Cornwall. Kent and Essex IFCA found a large number of 5cm bass on the river Stour in East Anglia on 1.11.22.

These catches suggest that settlement was more successful in the East than in the Southwest of England.

Other year classes

Niel Clark, who fishes the Helford and Fal year-round, reports very few 15-20cm bass in April this year. These smaller bass usually arrive in March, when the water temperature reaches 10-11°C. These are likely to be 2 year-olds, suggesting that the 2020 class was poor. Our assessment for this class was inconclusive, due mainly to the survey programme being severely impacted by Covid.

Lots of 26cm bass have caught by anglers this summer, especially in the Fal. RB had a catch of 5 bass around the 30cm mark in 2 sessions on the coast during a weekend in early October; scales from one of these were aged at 3 years old. These fish are likely to be from the 2019 class, which our surveys concluded was a good one.

9. FUTURE ACTIONS

We will continue to consolidate the Fal sites which are accessible without the use of a boat, and the Camel sites. We will continue to research possible new sites on the Fal, and Helford which can be accessed without a boat.

We will continue to try to identify volunteers who can help with the use of their boat.

Often the best tides for surveys fall during the week, when our helpers with work commitments are unavailable. We will continue to recruit additional helpers in order to spread the load, and ensure that adequate numbers of surveys can be carried out.

The weather monitoring started during last winter will be continued. It is hoped to supplement water temperature readings in the Helford and Fal with data from continuously monitoring F-POD and WATR devices.

A new Salinometer will be obtained and used for every survey.

We will consider developments in netting equipment and methodology which can be applied to our surveys.

Funding sources for equipment replacement, insurance and survey expenses will have to be found.

We will continue to develop our links with other bodies, such as Universities, Cefas, the Institute of Fisheries Management and Cornwall IFCA, in order to compare results, develop methodology, and promote greater use and recognition of the valuable data collected over the years in research and stock assessment.

10. OTHER OBSERVATIONS

I was very pleased to attend the presentation of Derek Goodwin's MBE 'For services to the Study of Fish Populations in Cornwall.' by Colonel Edward Bolitho, the Lord-Lieutenant of Cornwall in November at County Hall in Truro. It was wonderful to see his work being recognised by the Queen's representative in Cornwall, a very proud day for us all.

Derek receiving his MBE. Photo credit: Andrew Brown.

Data from the group's work has been included in two scientific papers from Cefas, with DG & RB named in the list of authors: "Pelagic connectivity of European sea bass between spawning and nursery ground" submitted to The Frontiers in Marine Science Journal, and "Assessing the coherence in biological and environmental drivers of young sea bass abundance across important estuarine nursery areas of the northern European sea bass stock." submitted to the ICES Journal of Marine Science.

Dr Kieran Hyder, Principal Recreational Fisheries Scientist at Cefas commented (September):" Keep up the good work with the survey – I will need to come back to you in advance of the sea bass data compilation workshop next year in order to make sure that it is considered as part of the benchmarking process."

Plymouth University are preparing a research bid under the FISP scheme looking at the movements of juvenile fish in estuaries. This will involve the deployment of novel underwater camera systems within several estuary systems, including the Fal/Helford, and the online analysis of the resultant images. It will also involve working with existing survey groups such as ours, to develop new surveys to ground truth video observations against net catches.

11. ACKNOWLEDGEMENTS & THANKS

To Derek Goodwin MBE, whose tireless work over many years in 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. He has rigged up a new 10m net, which is useful for sampling small pools, such as at Polingey. Derek has donated his dingy and engine, without which we would be unable to survey Lamorran, to the group. Derek deeply regrets not being able to hand his main boat over to the group for the survey work.

To 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".

To the Bass Anglers Sportfishing Society for their ongoing support.

To our fantastic volunteers, without whom this work could not take place. We are particularly indebted to Jon Williams for using his boat on all the surveys to sites requiring a boat to access, including 3 on the Fal and 1 on the Helford requiring a long steam round from Weir beach. Others who have helped this year include the following: Richard Brandon, Eddie Gummow, Brian Collick, Craig Baldwin, John Shipwright, John Tisdale, Peter & Alison Maddern, Sue Scott, Rob Taylor, Ben Harris, George Brew, Dave Jones, Frank Van-Veen, Simon Willey, Tim Coe, David Wilson, David Kelley and Steve Colclough.

I am also much indebted to my wife Angela for her sterling work repairing net tears.

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I would also like to express my gratitude to David Kelley for his help and insights regarding identifying survey sites on the Camel which his father Donovan used.

To Simon Cadman from the Cornwall Inshore Fisheries and Conservation Authority (CIFCA) for support and the issue of a dispensation to use a small mesh size net to catch undersize fish for research in the Fal and Helford. Also to Samantha Davies Chief Officer CIFCA for her continued support and her help netting in the past.

To the Truro Harbour Office for their support, in particular to Mark Killingback, Harbour Master, Paul Ferris the officer responsible for moorings who offered a sheltered mooring at Malpas in foul weather. Also to Nigel Knight patrolling the river for the Harbour Office.

To the staff at the Centre for Environment Fisheries and Aquaculture Science (CEFAS) at Lowestoft for their support and advice.

To Luke Humphries and Sharon Bowden at the Duchy of Cornwall for permission to net their fishery in the Helford.

12. APPENDICES - SURVEY REPORTS

Fal Bass Monitoring 2022 catch report sheets 1-11
Helford Bass Monitoring 2022 catch report sheets 1 – 5
Camel Bass Monitoring 2022 catch report sheets 1& 2

Robin Bradley
7.11.22

FAL BASS MONITORING (1) 2022

SITE No. 13 Ruan Creek SW 8690 4057 **DATE** 5.5.22 **OPERATORS** Robin Bradley, Jon Williams, Sue Scott

APPROXIMATE AREA NETTED Seine net 29.5 m' long by 2.0 m' deep. Total fishing time 6 x 10 mins.

METHOD Net held against tide with one end on shore and the other as far out as possible for 10 mins, then brought to south bank against the tide.

WEATHER CONDITIONS
Temperature ° C 19
Wind WSW 11
Cloud 5/8
Precipitation Dry
Overall Conditions Rating Good

TIDES (Falmouth BST)
H.W 0835 (4.6)
L.W 1455 (1.2)
H.W 2049 (4.7)

WATER CONDITIONS
Temperature °C 15.2
Salinity N/A
Clarity 3 ft+
Surface Smooth
Average depth 0.8m

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1200 - 1210							1	12.0	1	5.5	~ 100 small mullet (first run) ~ 100 small gobies (over most runs) ~ 4.5cm
1220 - 1230									1	6.4	~ 400 sand smelt (not first run) ~ 8.2-9.6, 11.3, 13.5 ~ 12 golden grey mullet (later runs)
1244 - 1254									1	6.5	1 flounder ~ 5 small crabs Sand Prawn (Crangon crangon) found (photo available).
1313 - 1323									1	6.6	Dwarf seagrass seen (photo available). Otter prints seen (photo available).
1333 - 1343									1	7.3	With thanks to Jon Williams for using his boat.
1352 - 1402									1	17.4	
Total	**0**		**0**		**0**				1	17.5	

FAL BASS MONITORING (2) 2022

SITE No. Penpol Creek SW 812 390 **DATE** 16.5.22 **OPERATORS** Robin Bradley & John Tisdale
APPROXIMATE AREA NETTED Not measured.
METHOD 30 x 2m net drawn across corner above causeway at the head of the creek using rope, then drawn to shore X 3

WEATHER CONDITIONS
Temperature ° C 16
Wind Mod S breeze
Cloud 6/8
Precipitation Dry
Overall Conditions Rating Fair

TIDES (Falmouth BST)
H.W 0556 (5.1)
L.W 1241 (0.4)
H.W 1819 (5.1)

WATER CONDITIONS
Temperature °C 20.0
Salinity N/A
Clarity < 1ft
Surface Smooth
Average depth 0.5

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1635			1	12.5					2	6.5	Bass came on first haul @ HW – 1h 44m + ~ 100 small mullet (~7cm) and 20 sand smelt (~8cm) + a few small (~ 3cm) ? herring and crabs.
1710									1	6.6	~ 500 larger mullet (13-15cm) + a few smelt and crabs on second haul @ HW – 1h 9m.
1740									2	7.0	~ 50 smelt on third haul @ HW – 39m
									1	7.3	A few gobies (3-4cm).
									1	7.4	Net caught by obstacle in same place on each pull (JT to remove at LW?)
									1	7.5	**Try hauls at HW – 2h, -1h 30 and -1 next time**
									1	8.2	Green weed clinging to rope.
									1	12.2	
									1	13.3	
									1	13.4	
									1	13.8	
									1	14.0	
									1	14.3	
									1	14.4	
									1	14.5	
									1	14.6	
									2	18.0	
									1	25.0	
									1	19.0	

FAL BASS MONITORING (3) 2022

SITE No. Penpol Creek SW 812 390 **DATE** 30.5.22 **OPERATORS** Robin Bradley & John Tisdale

APPROXIMATE AREA NETTED Not measured

METHOD 1 haul of net below causeway after holding for 5 minutes while waiting for tide to make. 30 x 2m net drawn across corner above causeway at the head of the creek using rope, then drawn to shore X 2.

WEATHER CONDITIONS
Temperature ° C 14
Wind NW gentle breeze
Cloud 4/8
Precipitation Dry
Overall Conditions Rating Good

TIDES (Falmouth BST)
H.W 0558 (4.8)
L.W 1241 (0.8)
H.W 1815 (4.9)

WATER CONDITIONS
Temperature °C 19.0
Salinity N/A
Clarity <1
Surface Smooth
Average depth 0.5

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1. 1610			1	13.2					1	7.3	A few smelts and mullet on first run below causeway.
2. 1645									1	7.6	~ 100 mullet & smelt (~ 8cm) on second run
3. 1710									1	14.5	~ 50 mullet + 25 smelt on third run
									1	19.8	Large tear in net on last run so ? fish lost
									1	19.7	Green weed clinging to rope on two runs above causeway.

FAL BASS MONITORING (4) 2022

SITE No. Gorrangorras Creek 794 347 **DATE** 1.6.22 **OPERATORS** Robin Bradley & Robert Taylor

APPROXIMATE AREA NETTED Not measured

METHOD 20 yard net hauled up channel near causeway on flood tide x 2. Net held against tide for 5 minutes and brought to shore x2, but tide too strong on second run.

WEATHER CONDITIONS
Temperature ° C 15.5
Wind SW Gentle breeze
Cloud 6/8
Precipitation Dry
Overall Conditions Rating Good

TIDES (Falmouth BST)
H.W 0712 (4.7)
L.W 1345 (1.0)
H.W 1927 (4.9)

WATER CONDITIONS
Temperature °C 18.7
Salinity N/A
Clarity 2ft
Surface Smooth
Average depth 1 ft

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1605			1	11.7					2	6.5	2 bass on first haul @ LW + 2h20m), 1 on second (LW + 2h40m); spots still evident.
1625			1	12.0					1	10.0	Mullet ~ 100 (mixed sizes) on each of first two hauls.
1645 to			1	13.0					1	10.5	Smelt ~ 100 (mixed sizes – some large ~ 12cm) on third haul.
1650									1	11.0 (GG)	Last haul (3h15m) abandoned as current too strong to hold.
1700											Weed on all hauls.
											This was the first attempt by RB to net this site. DG surveyed this site some years ago (see 2001 report). FVV had a catch of 290 '0' groups on 16.9.16 at LW+2 on a 5.4m tide.
											The entrance of the creek is rock on the West shore and a bar of sand and shingle extending from East shore which leaves a narrow entrance channel, where there are stepping stones and a shingle bottom. The entrance is netted by holding the net against the incoming tide (15 mins). Accessed site by parking at Bissom Housing Estate and taking footpath down to creek (~200 yds).

FAL BASS MONITORING (5) 2022

SITE No. Penpol Creek SW 812 390 **DATE** 13.6.22 **OPERATORS** Robin Bradley, Ben Harris, Mollie the dog

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 X 2.

WEATHER CONDITIONS
Temperature ° C 22
Wind NNW Gentle breeze
Cloud 3/8
Precipitation Dry
Overall Conditions Rating Very good

TIDES (Falmouth BST)
H.W 0441 (4.9)
L.W 1127 (0.7)
H.W 1708 (5.0)

WATER CONDITIONS
Temperature °C 23.2
Salinity N/A
Clarity <2ft
Surface Smooth
Average depth 0.5

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1540	0		0		0		1	4	1	6.2	~ 200 mullet + 50 smelt (8-10cm) + occ goby (4cm), herring (4cm) and crab on first haul
1600									1	7.8	~ 200 smelt + 5o mullet on second haul
									1	8.6	Permit inspected by Jochen Roukaerts from Animal and Plant Health Agency. Suggests try the pool by the bridge at Low water.
									1	12.5	Is this an '0' group only site?

FAL BASS MONITORING (6) 2022

SITE No. 15 Lamorran Gully SW 884 417 **DATE** 27.6.22 **OPERATORS** Robin Bradley, Jon Williams (boat), George Brew
APPROXIMATE AREA NETTED 2,000 sq' m'
METHOD Beach seine net hauled by wading. Net 29.5 m' long by 2.0 m' deep, mesh size approx' 5 mm knot to knot, (net knotless)

WEATHER CONDITIONS
Temperature ° C 18
Wind SW moderate breeze
Cloud 6/8
Precipitation Dry
Overall Conditions Rating Fair

TIDES (Falmouth BST)
H.W 0455 (4.5)
L.W 1130 (1.1)
H.W 1714 (4.7)

WATER CONDITIONS
Temperature °C 22.0
Salinity 0.7%
Clarity Clear to bottom
Surface Smooth
Average depth 30cm

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1525			1	10.7					1	11.1	This was the first time we had measured salinity, following the acquisition of a Tecpel 850 Salinity Meter from Tony Hooper (funded by BASS). Meter accuracy checked on a 1% saline soln.
			1	11.0					1	13.7	A few gobies (~5cm) and ~ 50 v.small (~3cm) ? herring ? smelts
			1	11.9					1	14.1	
			2	12.2							
			1	12.4							
			1	12.5							
			1	12.7							
			2	13.0							
Total			**10**	**Ave = 12.1**							

FAL BASS MONITORING (7) 2022

SITE No. 13 Ruan Creek SW 8690 4057 **DATE** 3.8.22 **OPERATORS** Robin Bradley, Jon Williams, John Shipwright

APPROXIMATE AREA NETTED Seine net 29.5 m' long by 2.0 m' deep. Total fishing time 5 x 10 mins.

METHOD Net held against tide with one end on shore and the other as far out as possible for 10 mins, then brought to south bank against the tide.

WEATHER CONDITIONS
Temperature ° C 23.5
Wind SW moderate breeze
Cloud 2/8
Precipitation Dry
Overall Conditions Rating Good

TIDES (Falmouth BST)
H.W 0920 (4.6)
L.W 1551 (1.1)
H.W 2132 (4.8)

WATER CONDITIONS
Temperature °C 21.2
Salinity 2.0(?)
Clarity 1 – 2 ft
Surface Slight ripple
Average depth 0.8m

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1330			1	13.0			1	7.3	1	3.5	~200 smelts – varying sizes between 4.0cm and 7.0cm
1350			1	14.5			1	7.5	2	4.5	~50 mullet of varying sizes
1415			5	15.0					2	5.0	A few gobies @ 4.5 - 5cm
1445			5	15.5					2	8.5	Occ herring @ 3.5 & 6cm
1510			1	16.0					1	9.0	
			1	16.5					5	9.5	* Scales = 1 year-old. Good growth for some ? spawned early 2021.
			1	17.0					3	10.0	
			1	17.5					4	10.5	
			1	18.0*					3	11.0	
			1	19.0					2	11.5	
			1	19.5					1	12.0	
			1	20.5					1	13.0	
			1	21.0					1	16.5	
									1	17.0	
Total			**21**	**Ave 16.4**							

FAL BASS MONITORING (8) 2022

SITE No. Penpol Creek SW 812 390 **DATE** 12.8.22 **OPERATORS** Robin Bradley & Ben Harris

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 27.0
Wind ENE Gentle breeze
Cloud 0/8
Precipitation Dry
Overall Conditions Rating Very good

TIDES (Falmouth BST)
H.W 0614 (5.0m)
L.W 1257 |(0.5)
H.W 1831 (5.4)

WATER CONDITIONS
Temperature °C 25.7
Salinity 1.8% (?)
Clarity < 1ft
Surface Smooth
Average depth 0.5m

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1630	1	5.5	1	16.9					1	4.5	~ 1,000 mullet, mostly around 5cm
	3	7.0	1	17.6					1	5.0	A few crabs
	1	7.1							1	5.5	At HW – 2 on this tide the corner is just filled. HW -2 to -1.5 seems to be the best time to haul the net. Tide probably best when > 5.0m.
	3	7.5							1	6.0	
	1	7.6							1	9.3	
	1	7.7							1	9.5	
	1	7.9							1	11.5	
	3	8.1							1	17.5	
	2	8.2							1	23.0	
	2	8.5									
	2	8.6									
	4	9.0									
	1	9.1									
Total	**25**	**Ave 8.0**	**2**								

FAL BASS MONITORING (9) 2022

SITE No. 7 Head of Polingey Creek 866 351 **DATE** 19.8.22 **OPERATORS** Robin Bradley & Ben Harris

APPROXIMATE AREA NETTED 1. ~ 200 sq m. 2. ~ 200 sq m

METHOD 1. Held 30 m net against tide just above causeway for 10 minutes before drawing to the N bank. 2. Hauled net through pool left by retreating tide on S side just above causeway.

WEATHER CONDITIONS
Temperature ° C 22
Wind WSW Moderate breeze
Cloud 4/8
Precipitation Dry
Overall Conditions Rating Good

TIDES (Falmouth BST)
H.W 1056 (4.3m)
L.W 1737 (1.6m)
H.W 2312 (4.2m)

WATER CONDITIONS
Temperature °C 22.1
Salinity 2.8(?)
Clarity To bottom
Surface Smooth
Average depth < 1m

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1. 1220	1	9.0							2	4.5	~ 500 mainly small mullet in the main creek and ~ 200 in the pool
2. 1300									2	5.5	Occ small crab
									1	5.6	A few prawns in the pool ~ 4cm.
									1	6.0	
									1	9.0	The method used on 22.7.03 hauled a 9m net through the pool 30 mins earlier in the tide, and gave ~ 300 '0' groups.
									1	11.0	Might be beneficial to arrive at HW on this height of tide, but perhaps slightly later in the day to allow the creek to warm further. Main creek could then be netted at several stages of the ebb, before hauling the pool when it became exposed.
									1	11.5	A new 10m net, rigged by Derek Goodwin, was used for the first time to net the pool.

FAL BASS MONITORING (10) 2022

SITE No. Penpol Creek SW 812 390 **DATE** 29.8.22 **OPERATORS** Robin Bradley & George Brew

APPROXIMATE AREA NETTED 600m2

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 ENE Gentle breeze
Cloud 5/8
Precipitation Dry
Overall Conditions Rating Good

TIDES (Falmouth BST)
H.W 0730 (4.9)
L.W 1352 (0.8)
H.W 1937 (5.1)

WATER CONDITIONS
Temperature °C 23.7
Salinity % 1.5
Clarity < 1ft
Surface Smooth
Average depth 0.5m

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1750	2	7.4							1	4.0	All bass came on first haul at 1750
1815	1	9.0							1	4.2	* scales confirm this year's fish
	1	9.5							1	4.7	~ 100 sandsmelts ranging from 3.8 to 6.0cm
	1	9.7							1	4.8	~ 1,000 mullet of various sizes
	2	10.0							1	5.0	~ 50 crabs – mostly on second haul
	1	10.1							1	5.1	
	1	10.2							1	5.5	
	1	10.6							1	5.8	
	1	10.9							1	7.0	
	1	11.2*							1	7.2	
	1	11.3							1	7.5	
									1	8.0	
									1	11.5	
									1	11.8	
									1	12.2	
									1	13.1	
									1	13.8	
Total	**13**	**Ave 9.8**									

FAL BASS MONITORING (11) 2022

SITE No. 7 Head of Polingey Creek 866 351 **DATE** 6.9.22 **OPERATORS** Robin Bradley & Dave Jones

APPROXIMATE AREA NETTED 1. ~ 200 sq m. 2. ~ 200 sq m

METHOD 1. Held 30 m net against tide just above causeway for 10 minutes before drawing to the N bank (x3). 2. Hauled net through pool left by retreating tide on S side just above causeway. *

WEATHER CONDITIONS
Temperature ° C 17
Wind S Moderate breeze
Cloud 7/8
Precipitation Showers
Overall Conditions Rating Poor

TIDES (Falmouth BST)
H.W 0142 (4.0m)
L.W 0813 (1.9m)
H.W 1425 (4.3m)

WATER CONDITIONS
Temperature °C 19.8
Salinity N/A (meter not working)
Clarity 1 ft
Surface Sl. chop
Average depth <1m

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1. 1455 - 1505									1	4.5	A few small (~4cm) mullet on first three hauls. Numerous crabs on second and third hauls.
1. 1515 - 1525									2	5.0	~ 200 small (~4cm) mullet + occ crab and prawn in the pool.
1. 1535 - 1545									2	6.5	
									1	11.0	
2. 1630									2	12.0	

HELFORD BASS MONITORING (1) 2022

SITE No. 20 Head of Polwheveral Creek SW 739 284 **DATE** 14.5.22 **OPERATORS** Robin Bradley, Sue Scott, Craig Baldwin, Brian Collick, Peter & Allison Maddern.

APPROXIMATE AREA NETTED 900 sq' m'

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 18
Wind ENE Light Breeze
Cloud 2/8
Precipitation Dry
Overall Conditions Rating Good

TIDES (Falmouth BST)
H.W 0422 (4.9m)
L.W 1108 (0.7m)
H.W 1650 (4.8)

WATER CONDITIONS
Temperature °C 18.7
Salinity N/A
Clarity ~ 2ft
Surface Smooth
Average depth ~ 1m

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1600	0		0		0				1	6.0	Several thousand (? 5,000) small mullet around the 6-7cm size. Presumably these are 'Young of year', and present in estuaries earlier than bass?
									1	6.4	Approximately 1 in 50 of the fish (~100) were sand smelts ~ 7cm. A few smaller sand smelts (~4cm) – identified by FVV.
									2	6.5	
									2	6.8	
									1	9.5	
									1	28	
									1	30	
									1	32	
Total	**0**		**0**		**0**						

HELFORD BASS MONITORING (2) 2022

SITE No. Merthen SW 723 258 **DATE** 19.5.22 **OPERATORS** Robin Bradley, Jon Williams, John Shipwright
APPROXIMATE AREA NETTED
METHOD Net held against tide for 10 mins and brought to S shore (~ 50 yards downstream of power cable sign) x 4.

WEATHER CONDITIONS
Temperature ° C 15
Wind SSW Gentle breeze.
Cloud 3 – 4/8
Precipitation Dry
Overall Conditions Rating Good

TIDES (Falmouth BST)
H.W 0820 (4.9)
L.W 1449 (0.6)
H.W 2036 (5.1)

WATER CONDITIONS
Temperature °C 15.5
Salinity N/A
Clarity <1ft
Surface Smooth
Average depth Tidal

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1240			6	11.0			1	16	2	4.0	Two bass came on first haul @ 2h before LW
to			19	11.5			1	4.5	2	4.5	Bulk of bass (about equally split between the two hauls) came on second (i.e. 1.5h before LW) and third (i.e. 1.25h before LW). None after this.
1250			42	12.0					1	5.5	A few smelt (~7cm), mullet, goby (3.5cm) and crabs on first, second and third hauls. Occ herring (4cm).
1310			42	12.5					2	6.0	Approx 1,000 mullet (~4cm) on fourth haul.
to			21	13.0					2	6.5	1 Pipefish (18cm)
1320			3	13.5					2	7.0	1 Dover Sole (14.5cm)
1330									1 (GG)	10.0	
to									2 (GG)	11.0	
1340									1	11.5	
1350									1	12.0	
to									2	12.5	
1400									1	14.0	
									1	14.5	
									5 (2GG)	15.0	
									4 (1GG)	15.5	
									1	16.0	
									2	16.5	
									1	17.5	
									1	26	
									1	29	

Not measured			20	-							
Total			**155**	**Ave 12.2**							

HELFORD BASS MONITORING (3) 2022

SITE No. 20 Head of Polwheveral Creek SW 739 284 **DATE** 16.6.22 **OPERATORS** Robin Bradley, Sue Scott, Frank Van-Veen
APPROXIMATE AREA NETTED 900 sq' m'
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 22
Wind ENE Gentle breeze
Cloud 7/8
Precipitation Dry
Overall Conditions Rating Good

TIDES (Falmouth BST)
H.W 0725 (5.0)
L.W 1400 (0.5)
H.W 1944 (5.2)

WATER CONDITIONS
Temperature °C 22.2
Salinity N/A
Clarity ~ 2ft
Surface Smooth
Average depth ~1m

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1830	0		1	13.5	1	24.7			1	7.0	~ 200 smelt – a few very small ones (~3cm) but mostly ranging from 8.5 – 11.8.
			1	13.6					1	8.0	~ 100 mullet
			1	13.9					1	8.2	A few gobies ~ 5cm
			3	14.0					1	8.5	
			1	14.5					1	8.6	
									1	9.2	
									1	9.7	
									1	13.0	
									1	21.1	
Total	**0**		**7**	**Ave 13.9**	**1**						

HELFORD BASS MONITORING (4) 2022

SITE No. 20 Head of Polwheveral Creek SW 739 284 **DATE** 28.7.22 **OPERATORS** Robin Bradley, Jon Williams, Frank Van-Veen, Brian Collick, George Brewer

APPROXIMATE AREA NETTED 900 sq' m'

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 25.5
Wind SW light breeze
Cloud 4/8
Precipitation Dry
Overall Conditions Rating Very good

TIDES (Falmouth BST)
H.W 0601 (4.6m)
L.W 1229 (1.2m)
H.W 1816 (4.9m)

WATER CONDITIONS
Temperature °C 28.0
Salinity 2.5% (?)
Clarity <1 ft
Surface Smooth
Average depth ~1m

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1715	1	6.1							~5,000	~5cm	~ 100 gilthead bream - ave length 8.7cm
	2	6.3							1	7.5	
	1	6.4							2	10.0	
	2	6.8							1	10.5	
	5	7.0							1	10.7	
	8	7.5							3	11.0	
	2	7.6							1	11.5	
	2	7.7							1	12.5	
	3	7.8									
	6	8.0									
	1	8.4									
	4	8.5									
	1	8.7									
	1	8.8									
Total	**39**	**7.6 Ave**									

HELFORD BASS MONITORING (5) 2022

SITE No. 20 Head of Polwheveral Creek SW 739 284 **DATE** 26.8.22 **OPERATORS** Derek Goodwin, Steve Colclough, Robin Bradley, Simon Willey, George Brew, Jon Williams, Craig Baldwin, Frank Van-Veen

APPROXIMATE AREA NETTED 900 sq' m'
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 30
Wind NNW Light breeze
Cloud 4/8
Precipitation Dry
Overall Conditions Rating Good

TIDES (Falmouth BST)
H.W 0543 (4.7m)
L.W 1208 (1.2m)
H.W 1757 (5.0m)

WATER CONDITIONS
Temperature °C 24.9
Salinity % 2.6
Clarity <1ft
Surface Smooth
Average depth ~1m

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1650	1	5.2							1	3.4	Bass year class assigned on length alone. Scale samples for age confirmation were not obtained. '1' group bass would normally be expected to have attained at least 15cm by this stage in the year.
	1	5.7							2	3.9	~ 5,000 mullet - a range of sizes as shown.
	2	6.6							1	4.0	A few gobies @ 3.8 – 4.2cm
	1	7.2							1	4.5	A few sand smelts @ 4.0 - 8.0cm
	4	7.5							1	5.4	1 sardine @ 7.6cm
	1	8.0							1	5.5	A few shore crabs
	1	9.7							1	5.8	
	2	10.0							1	5.9	
	2	10.2							1	6.0	
	1	10.8							1	6.2	
	1	11.1							1	6.3	
	1	11.5							2	6.5	
									1	6.9	
									1	9.6	
									2	10.2	
									1	10.5	
									1	11.6	
Total	**18**	**6.9** (to 8.0) **10.4** (>9.7									

CAMEL BASS MONITORING (1) 2022

SITE No. Trewornan Dam SW 988 743 **DATE** 8.8.22 **OPERATORS** Robin Bradley, Richard Brandon, Eddie Gummow. James
Menhennick met us on site.

APPROXIMATE AREA NETTED 300 sq m
METHOD Haul net up creek along north end of dam once.

WEATHER CONDITIONS
Temperature ° C 22
Wind NW Gentle breeze
Cloud 0/8
Precipitation Dry
Overall Conditions Rating Very good

TIDES (Falmouth BST)
H.W 0145 (4.3)
L.W 0826 (1.6)
H.W 1430 (4.3)

WATER CONDITIONS
Temperature °C 25.6
Salinity 0.6 (?)
Clarity <1ft
Surface Smooth
Average depth < 1m

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1430	1	6.2							1	4.3	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 at the downstream end of the creek we netted. We did not attempt this. The Amble channel looks too difficult to net due to soft mud.
	1	6.5							1	4.5	Tide insufficient to completely fill creek and made pulling along the dam side difficult in the mud. Need a tide of around 4.8m.
									1	5.1	~200 small (~4cm) mullet, ~50 larger mullet of various sizes.
									1	6.4	
									3	7.0	
									1	7.5	
									2	8.0	
									1	16.0	
									1	16.8	
									1	17.5	
	2	**6.3**									

CAMEL BASS MONITORING (2) 2022

SITE No. Rail Bridge Pool SW 927 742 **DATE** 16.9.22 **OPERATORS** Robin Bradley, Tim Coe, David Wilson, David Kelley
APPROXIMATE AREA NETTED NK
METHOD 20m net drawn through pool under bridge.

WEATHER CONDITIONS
Temperature ° C 15
Wind NNW Moderate breeze
Cloud 4/8
Precipitation Dry
Overall Conditions Rating Poor?

TIDES (Falmouth BST)
H.W 0936 (4.7m)
L.W 1612 (1.3m)
H.W 2148 (4.5)

WATER CONDITIONS
Temperature °C 18
Salinity N/A
Clarity Nil
Surface Ruffled
Average depth < 1m

Time	Bass:- year class & total length						Flounders		Mullet		Other Bass, Fish & Remarks
	2022		2021		2020		No.	TL (cm)	No.	TL (cm)	
	No.	TL (cm)	No.	TL (cm)	No.	TL (cm)					
1430											The location under the old railway bridge funnelled the cool wind. Access, and getting the gear down the embankment (weedy at bottom), is difficult and required a rope to haul the net box up the slope. The 20m net is a bit long so try the 10m net next time. The photo in Don Kelley's 'Forty Anglers' shows them netting slightly further downstream than we were, but the positioning of pools will vary over time.
							1	23	3	4.5	~ 200 mullet ranging from 4.5 to 14.0cm.
									1	5.0	~ 200 prawns ~ 5.5cm
									3	6.0	Occ goby
									8	6.5	
									1	7.0	
									1	8.0	
									1	11.0	
									1	12.0	
									1	13.0	
									1	14.0	