



# A BASS FISHERY MANAGEMENT PLAN

**For The Restoration of the UK Bass Stock**



Discussion and proposals  
In response to the  
Fisheries Act 2020



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## Executive Summary

### Background:

The Fisheries Bill 2020 sets out the requirement for Fisheries Management Plans (FMPs) for a range of fish species of importance to commercial and recreational users.

This discussion and proposal document seeks to review the scientific and economic data concerning the European sea bass (*Dicentrarchus labrax*) in order to identify the most effective management measures to be included in the Bass FMP (BFMP). To enable the restoration of the depleted stock and to ensure the future sustainable use, by the most economically efficient user base and maximise the trickle-down economic and social benefits to coastal businesses and communities.

### The UK Bass Fishery - Commercial and Recreational:

Bass is a species of importance to both commercial fishermen and recreational anglers and divers. UK commercial bass first landing values in 2018 calculated to be €5.3 million (1% of total catch value) UK recreational angling expenditure on bass fishing calculated to be between €188 and €282 million Recreational catches have comprised up to 25% of the total UK catch in the past (*Armstrong et al 2013*)

### The Biology and Ecology of Bass:

Bass are a slow growing and long-lived species

First maturity for females is usually at 42cms length - approx 6 years of age

Capable of living for 28 years with a reproductive capacity of circa 20 years

Adults undertake annual pre-spawning migrations each autumn and over-winter in deep water

Having spawned the adult bass return to inshore feeding grounds in spring

Bass exhibit strong site fidelity and often frequent broadly the same areas each summer

The Spawning Stock Biomass (SSB) has halved since 1985 mainly due to overfishing

Restrictions on catch allowances and closed seasons introduced by EU in 2015 due to falling stocks

### The Economics of Bass:

There have been numerous studies conducted into the economic values of sea angling and bass:

- **2000 - Nautilus Consultants Ltd** - *Sea angling made a gross annual contribution to the coastal economy of Wales of over £28 million and employed 471 persons.*
- **2004 - Drew Associates** - *Consumer surplus benefits of sea angling between £602m & £1,300m*
- **2004 - Net Benefits** recommendation - *Fisheries departments should review the evidence supporting arguments for re-designating commercially caught species for wholly recreational sea angling, beginning with bass by the end of 2004.*
- **2005 - Invest in Fish South West** - *Sea angling in the South West generates £165 million of expenditure within the region each year. We estimate that over 3000 jobs are linked to sea angling in the South West. Our best estimate of consumer surplus for South West resident anglers is £77 m.*
- **2014 - Blue Marine Foundation** - *The final economic output per tonne of bass retained in Sussex is almost 40 - 75 times higher for recreational bass fisheries than for commercial bass fisheries. The employment generated per tonne of bass retained is 39 -75 times higher for recreational bass fisheries than for commercial bass fisheries*

- **2015 - Inland Fisheries Ireland** - *Total Contribution of Irish bass Recreational Fishery to Irish Economy: € 52 million. An estimated 33,000 overseas anglers, who identified as fishing exclusively for bass, spent between €28 million and €34 million in pursuit of bass*
- **2017 - Cefas / Substance Sea Angler Diary Project** - *total expenditure by sea anglers = £1.94 billion, total jobs supported by sea angling = 16,313. Sea anglers in England and Wales released 80% of the bass that they caught*
- **2021 - European Market Observatory for Fisheries and Aquaculture Products** - *UK recreational angling expenditure on bass fishing calculated to be between 188 and 282 million Euros compared to commercial first sale value of 5.3 million Euros*

### **Our Proposals for a Bass Fisheries Management Plan:**

**GOAL - To Maximise the Long-term Socio-economic Benefits to UK Coastal Communities from a Fully Restored Bass Fishery. This can be achieved by:**

- **Restoring the bass stock and maintaining it at or above 60% of the unfished spawning stock biomass, i.e. as it was before being overfished. This could also enhance a depleted gene pool**
- **Working towards a bass stock structure that is more natural in terms of age and size, with many more large, highly reproductive bass aged 15 + (>70cm) in the stock. Their value is at least two fold: BOFFS for fecundity and to satisfy 'angler ambitions' sized fish to drive and stimulate recreational activity and expenditure**
- **Implementing robust assessments of 0, 1 & 2 year old cohorts in order to adjust catch levels prior to becoming aware of either good or poor recruitment into the bass fishery**
- **Ensuring juvenile bass are well protected by a combination of nursery areas and MCRS and ecosystems important for bass are protected, restored and developed**
- **Legislating for bass to be protected from localised depletion due to overfishing and spawning bass and bass migrating to spawning areas are well protected through effective legislation and proactive enforcement**
- **Making sure that all commercial bass catches are reported by fishermen and there are high quality estimates of recreational bass catches and ensuring that there are high levels of compliance with management measures by both sectors**
- **Creating a management plan where Bass bycatch is minimal and adequately researched to better understand discard contribution to mortality**
- **Where fishing activities that are congruent with the overall goal are supported and developed. Fishing activities that conflict with the goal are minimised, or phased out**

## Background

The Fisheries Bill gained royal assent on 23rd November 2020 and is now enshrined in UK law as the Fisheries Act 2020 (**the Act**) in preparation for the UK to fully leave the EU, following the end of the transition period on 1st January 2021. **The Act** gives the UK full control of its fishing waters for the first time since 1973.

**The Act** sets out the requirement for the introduction of Fisheries Management Plans (FMPs) and defines an FMP as -

***A document which sets out the policies designed to restore one or more species of sea fish to, or maintain them at, sustainable levels.***  
***Each plan will specify the stock(s), type of fishing and geographic area covered.***

In January 2022, the UK Government, Scottish Parliament, Northern Ireland Executive and Welsh Government issued a Consultation of the Draft Joint Fisheries Statement (JFS), setting out the scope and ambitions of FMPs in section 5. of the Consultation. The four national fisheries authorities have collectively identified those biological stocks fished in UK waters that plans could cover, based on information from ICES, international agreements and data on landings into the UK. They have also issued statements, setting out their policy objectives and steps they are taking together, to deliver their shared ambition for sustainable fisheries.

Within the draft JFS, there are eight agreed fisheries policy objectives and each one has been allocated a corresponding number and colour-coded symbol, to cross-reference against the suitability of any proposed stock management measure or management tool. We interpret this system as being a simple method of identifying management proposals that will align with the core objectives i.e. the higher the number of objective symbols accredited to a stock management proposal, the more suitable it would be for adoption within a particular FMP. We have adopted the use of this number /colour system in our bass FMP proposals.

Objective	Number
Sustainability objective	1
Precautionary objective	2
Ecosystem objective	3
Scientific evidence objective	4
Bycatch objective	5
Equal access objective	6
National benefit objective	7
Climate change objective	8

Within Annex A (pages 56 to 62) of the draft JFS, a table of proposed FMPs has been prepared. Some FMPs are for multi-species plans and others are single species plans. Bass is to be the subject of a single species FMP. This discussion and proposal paper will set out our proposals for restoring and then ensuring truly sustainable exploitation of bass and will reference the wide range of scientific and socio-economic studies, specifically related to the European sea bass (*Dicentrarchus labrax*).

## Why a bass FMP?

Sea Bass is the perfect subject for a single species FMP due to its almost unique life cycle and habits. This will allow for a tailor-made suite of effective management measures, to ensure the stock's restoration to previous abundance and to then maintain a robust SSB to allow for future fluctuations in recruitment due to the possible adverse effects of climate change and human encroachment within the habitats upon which the young bass depend e.g. the building of marinas and land reclamation for housing in and around estuarine environments, as well as land run-off and pollution.

Our contention is that a bass FMP must, as a basis for all future management objectives, take into account AND ACT UPON the available science and adhere to the premise that the biology and proven habits of the species should dictate the future management tools that are used to ensure the much needed recovery and sustainable exploitation from both commercial and recreational stakeholders.

The standard optimal exploitation target of Maximum Sustainable Yield (MSY) has arguably caused the virtual collapse of the bass breeding stock and only the recent introduction of strict extraction controls on fishers appears to have halted the decline.

The potential economic benefits of a change in objective, towards a revised target of abundance and Maximum Economic Yield (MEY) can be demonstrated and when combined with a bass FMP, that puts the well-being of the stock as the priority, the latent value of the UK bass fishery could be harnessed for the truly sustainable long-term benefit of our coastal communities.

Perhaps the most insightful study of the potential value of the bass fishery was *Defining the Economic and Environmental Values of Sea Bass*, commissioned by Blue Marine Foundation in 2014 and conducted by MRAG Ltd. The aim of the project was:

***To highlight the socio-economic values of bass, as well as the environmental impacts for various segments of the commercial and recreational sectors targeting bass in the Sussex IFCA region of England***

### Results summary

- Recreational fishers were estimated to have removed 22.16 tonnes of bass in 2012
- Commercial fisheries were reported to have landed 247.58 tonnes of bass in 2012
- **Per tonne** of bass removed, recreational angling in Sussex is estimated to create £1.6 - 3.0 m in terms of final economic output and 18 - 34 jobs / Full-Time Equivalentents (FTEs)
- **Per tonne** of bass removed, commercial fishing in Sussex is estimated to create £0.04 m in terms of final economic output and 0.45 FTEs

***The final economic output per tonne of bass retained in Sussex is almost 40 - 75 times higher for recreational bass fisheries than for commercial bass fisheries.  
The employment generated per tonne of bass retained is 39 -75 times higher for recreational bass fisheries than for commercial bass fisheries.***

## The UK Bass Fishery - Commercial and Recreational

On 1st October 2021, the Devon & Severn Inshore Fisheries Conservation Authority (D&SIFCA) released its **Fisheries Research & Management Proposals** for five fisheries within its district and described the European sea bass as:

*An important commercial species that has been fished in Europe for centuries, and more recently has also been farmed for human consumption (Pickett and Pawson, 1994). Sea bass is also considered as the “premier sporting fish” and supports recreational fisheries across its range (Kelley, 1988).*

And with respect to the bass fishery commented:

*Sea bass is one of the most challenging species for fisheries managers, due to its migratory routes covering large areas and its popularity with both recreational and commercial fishers internationally.*

For some inshore commercial fishers, bass is an important component of their catch, especially those practicing hook and line (H&L) capture methods. While a relatively small number rely almost exclusively on catching bass, others only target the species when quota for other species has been exhausted, or seasonal abundance of bass e.g. during pre-spawning migrations, makes it worthwhile switching gears to concentrate on bass, while the opportunity presents. Bass is a non-quota species.

In November 2021 the European Market Observatory for Fisheries and Aquaculture Products released a document - **Commercial and Recreational Fisheries for Wild Seabass in the Atlantic - Economic and Market Study**. Under the heading of Main Findings (page 1.) it concluded that:

*For the North Sea, English Channel and Celtic Sea, the UK and France are the main places in terms of first value of 5.3 and 3.7 million Euros respectively in 2018. This corresponds to 1% and 2% of total first sale value in these seaboards, respectively for UK and France.*

On page 2. of the report, the estimated expenditure in recreational bass fisheries are given as:

	Related Expenditure ( Million EURO)	Share of Total Sea Angling Sector Economic Weight
France	100	20%
UK	188 - 282	20 - 30%



## Bass Biology & Ecology

Due to the dual interests of the commercial fishing sector and the recreational fishing sector (angling and spear fishing), there has been considerable scientific research into the biology and habits of this popular species of fish, spanning the past fifty years or more. One of the earliest 'Citizen Science' projects appertaining to bass, was a tag and release study conducted by Donovan Kelley in the early 1970s, for which he was awarded an MBE in 1991.

More recently, Derek Goodwin was also awarded an MBE for his voluntary work with The Helford Marine Conservation Group, in netting and recording the abundance of baby bass in Cornish estuaries. At 96 years young Derek has dedicated nearly thirty years of his life to this task - such is the passion that many people hold for bass and there are plenty of opportunities to expand similar Citizen Science projects, relating to the ongoing study of bass, throughout its life stages.



*members of the Helford Marine Conservation Group & BASS conduct survey of juvenile bass in a Cornish creek*

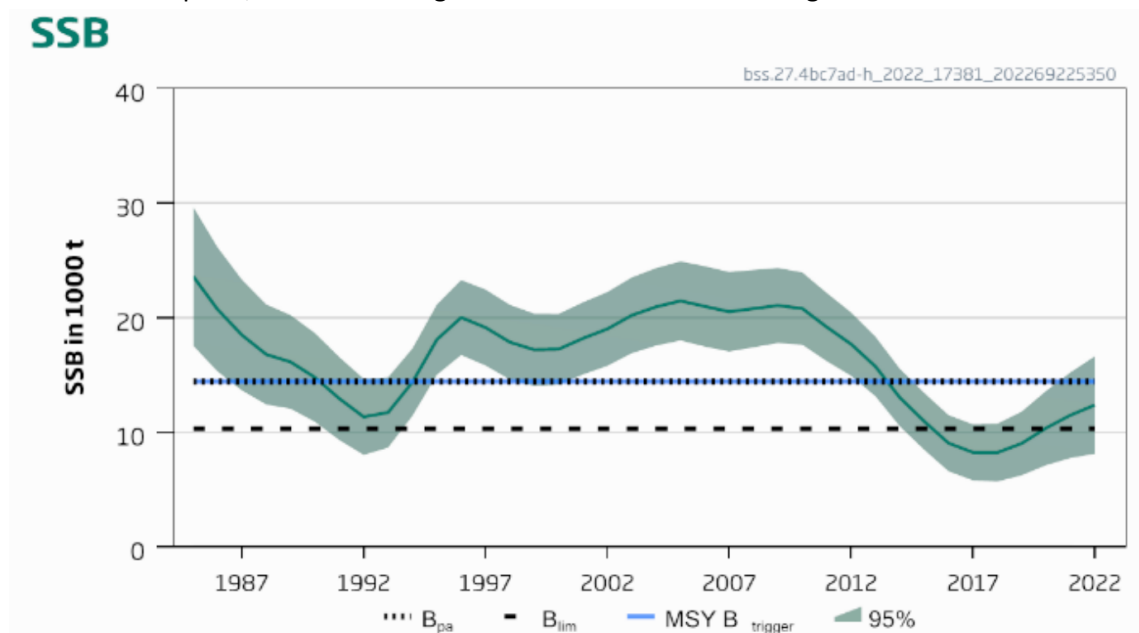
These tiny bass could live for 28 years and grow to 20lb (9kg), with 20 years of reproductive capacity. The information that we can gather from regularly counting the 0 and 1 group bass each year, at the same nursery sites, on the same tides, at the same time of year, will tell us how many have survived the journey from the spawning grounds and their first winter. This will give a longer-term picture of the ups and downs of bass recruitment and offer a prediction of the future robustness of bass stocks. If we ignore the foresight that the young bass are providing us with, we risk depleting the adult stock and it is especially important that the survivors are given the chance to reproduce to provide a broad range of ages and sizes within the stock. We can ill-afford not to do so, as over-fishing will then put a strain on the stronger and fitter fish, when we should be protecting them to ensure healthy and sustainable stocks for the future.

## Bass Stocks are in Trouble

For many years, the bass stocks have been in decline, mainly as a result of overfishing and poor recruitment - adolescent fish entering the adult Spawning Stock Biomass (SSB).

- In 2014/15 the SSB fell to below 15,000 tonnes, the point at which scientists advised remedial management action, known as  $B_{trigger}$ .
- By 2016/17 the SSB had fallen again to around 10,000 tonnes or  $B_{lim}$ , the point at which it is estimated that the stock will have difficulty sustaining itself through natural reproduction and it continued to fall for two more years.

At this point, fisheries management turned into crisis management.

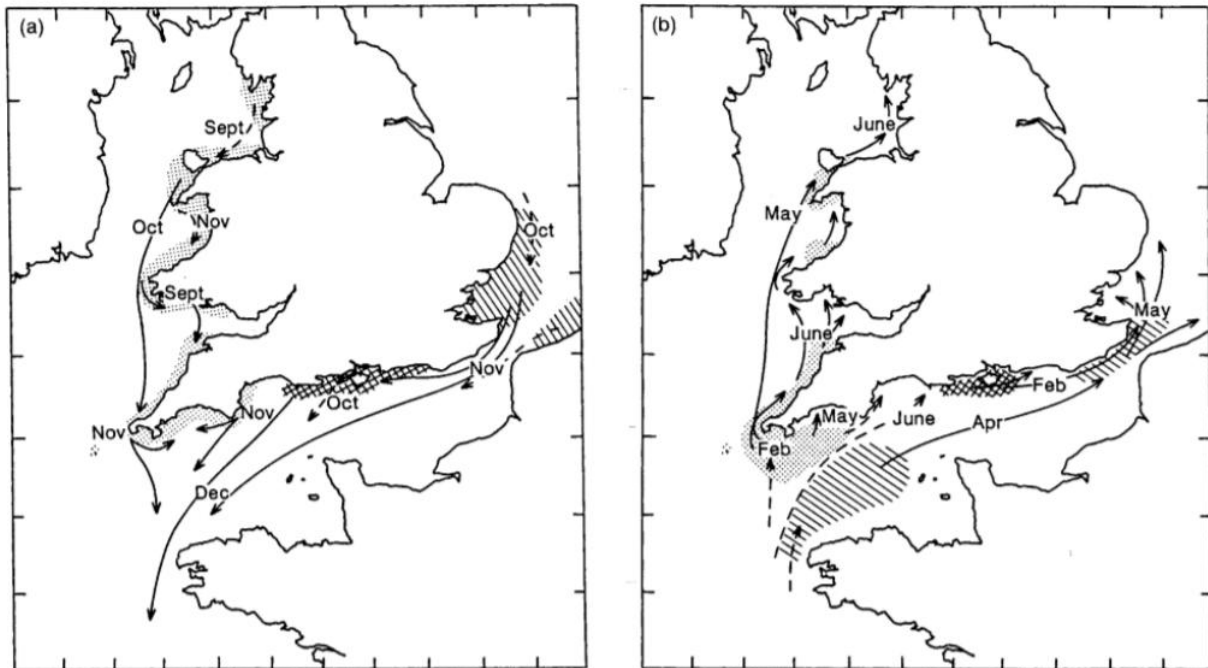


ICES / CIEM advice on sea bass for areas North Sea, English Channel, Irish Sea, Bristol Channel, Celtic Sea 2022

Bass is a slow growing, late maturing species and in UK waters females take an average of 6 years to become mature, compared to North Sea mackerel, where 90% can be mature from age 2 (ICES).

Their biology and habits can make them vulnerable at certain stages in their life cycle. For example, adult bass migrate each autumn, from their summer inshore feeding grounds to pre-spawning sites. They congregate in dense shoals in deep water, as a constant temperature is required for their gonads to become fully ripe and in readiness to spawn. As they form large aggregations at established, well-known reefs and tide races, they are caught in large numbers during this vulnerable time in their lives. For many new recruits to the adult stock, this will be their first and final journey, as many will never reproduce if they are taken during the annual migration.

The routes of these spawning migrations have been documented since the early bass tagging studies by D.F. Kelley MBE in the late 70's and early 80's and confirmed in the 2000 to 2006 tagging study conducted by scientists from Cefas and IRAMERE, in which members of BASS assisted by capturing and tagging bass, then releasing them back to the sea. Of the approx. 2,500 adult bass tagged, 200 were re-caught and their movements traced when the fish were recaptured. One fish was tagged in Wales by one of our members and then caught and released a further three times, within close proximity to its first point of capture, over the course of the next three successive years.



(a) Seasonal migrations of adult bass from summer feeding grounds to offshore pre-spawning sites  
 (b) Spring return migrations from over-wintering sites to spawning sites and summer feeding grounds  
 (ICES 2001)

The 2000 to 2006 tagging study led to the publication of the scientific paper - *Will philopatry in sea bass, *Dicentrarchus labrax*, facilitate the use of catch-restricted areas for management of recreational fisheries?* (M.G. Pawson, J Leballeur, M. Brown, G. D Pickett) and concluded that adult bass exhibit strong 'site fidelity' tendencies i.e. they return each summer to distinct and for some, specific coastal areas. The abstract from the paper reads as follows:

*Many adult sea bass (>40 cm total length) tagged between May and October around the coasts of England and Wales have been recaptured close to their respective tagging locations in successive years. Analysis of mark and recapture data sets, for the late 1970s and early 1980s and in 2000–2006, show that some 55% of all recaptures were within 16 km of their original release position. This suggests that mortality rates of adult bass in local populations could be reduced by around 50% if a number of carefully selected areas were designated as catch and release only for bass, thus providing a management option with which more and bigger sea bass will be available to recreational sea anglers.*

More recently, the C-Bass project has been using data storage tags, inserted into the body cavity of bass, to monitor the seasonal movements of bass around the shores of the UK and France and reveal how far bass travel during their winter pre-spawning and returning spring migrations.

From <https://marinescience.blog.gov.uk/2016/01/18/c-bass-on-the-move/> .

*Our longest track so far is a 300 day record from one of our Weymouth bass. The data show that it swam west following release on 4 November 2014, out into the Western Approaches. It then went up into the Celtic Sea where it spent January to March. During April to June (Quarter 2) it swam south, before returning to the Channel. The fish continued on an eastward bearing before it was captured by a UK Otter Trawler in the Eastern Channel on 30 August 2015.*

# THE LIFE CYCLE OF BASS

Compiled by Robin Bradley

For anglers interested in the biology of bass, the Bass Anglers Sportfishing Society (BASS) has produced this brief note on the life cycle of bass in UK waters, drawn from information available at the time of writing (February 2021).

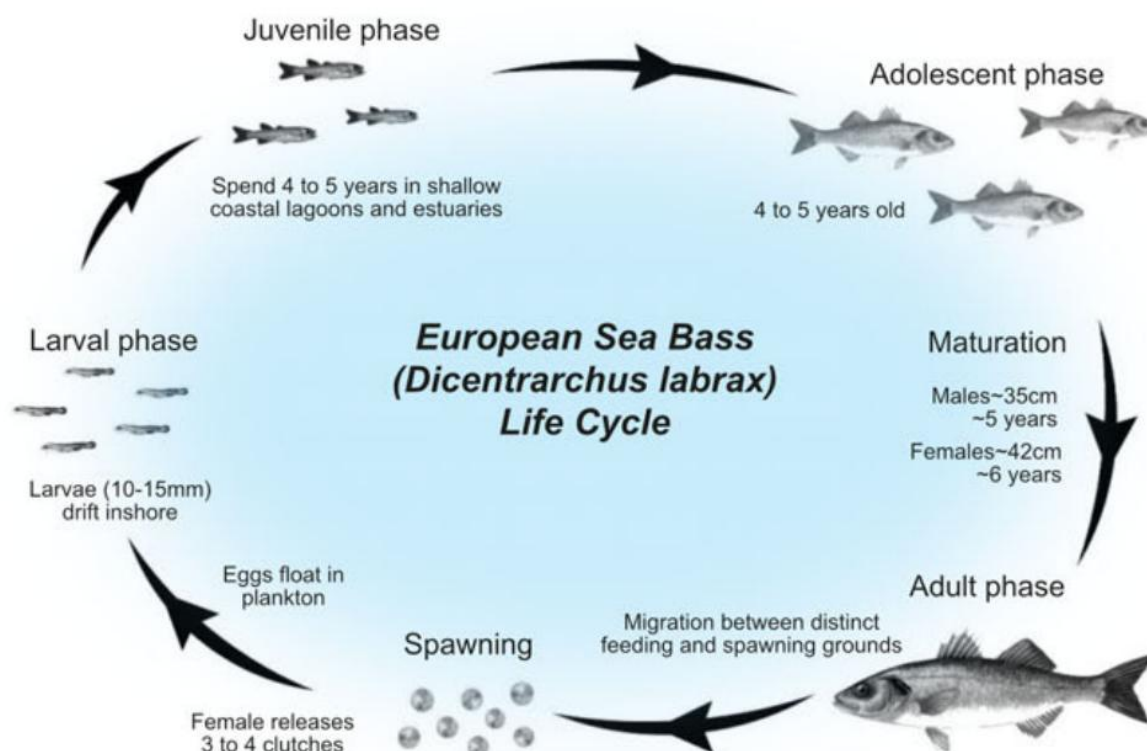


Illustration of the European sea bass *Dicentrarchus labrax* life cycle.  
Source: Population Dynamics of the European Sea Bass (*Dicentrarchus labrax*) in Welsh Waters By Abi Carroll  
Reproduced with author's permission.

Image obtained from NWIFCA website.

## Early years

Bass spend the early years of their lives mainly in or near their nursery estuary, usually moving out for the winter. In their adolescent phase (5-6 years), bass wander widely and apparently at random, adopting at the end of this phase the area for their future summer life.

## Adulthood

Upon reaching sexual maturity at age 5 (males) or 6 (females), bass enter their adult phase (scientists call this 'recruitment' into the mature bass biomass). They spend each summer and early autumn on the same inshore feeding grounds, exhibiting so-called 'site fidelity'. The oldest bass recorded was thought to be 28 years old.

## Migration and spawning

During the late autumn and winter, bass migrate south, down the west coast of the UK, and west, along the south coast of the UK, aggregating into large shoals as they prepare to make their way to their overwintering/pre-spawning grounds at the western end of the English Channel. The trigger for this migration seems to be falling water temperatures, since a temperature of more than 9°C is needed for successful spawning.

Not all bass migrate offshore in winter, but those which don't are likely to be smaller fish, which have not yet reached sexual

maturity. Numbers of fish which are running with eggs or milt might indicate late migration, or nearby inshore spawning areas. Occasional large fish are caught inshore during February, but whether these are loners, or indicative of a wider phenomenon is, as yet, unclear.

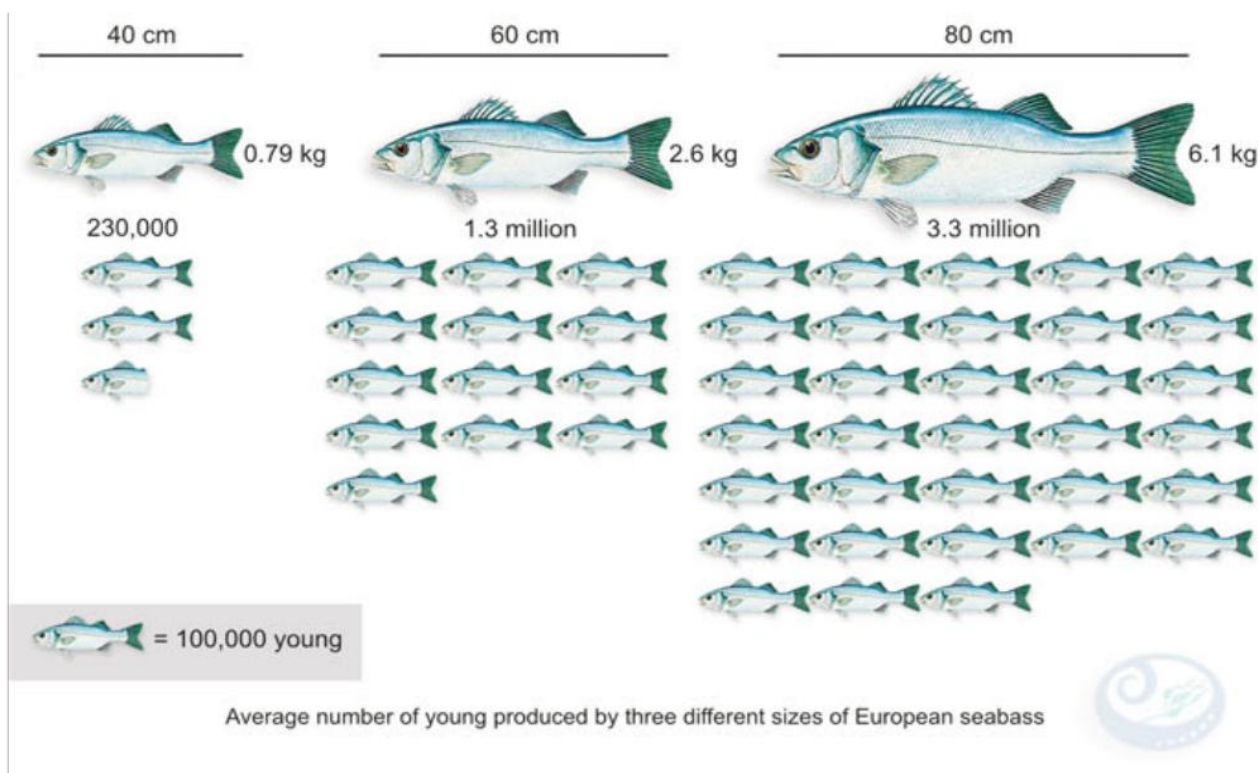
During the late winter and spring, bass begin spawning in the English Channel, and off North Cornwall; it may take place at other sites as well (such as off the Isle of Man). Day length and water temperature are thought to be important influencers on the onset of spawning. A mature female bass will produce between a quarter and a half a million eggs per kg of body weight per spawning season. Large older female fish, so-called BOFFFFs (Big Old Fat Fecund Female Fish) produce more and bigger eggs, which survive better. Once mature, bass can continue to reproduce for up to 20 years.

## Year class success

The larvae arising from fertilised eggs at first drift towards the coast, assisted by currents and onshore winds (particularly if these are from a westerly direction). After about 2-3 months, the larvae begin to move actively into juvenile nursery habitats, possibly attracted by reduced salinity or higher water temperatures, arriving in June.

From about the beginning of July, the tiny (~3cm) '0' group fry can be found in estuaries. These are assessed in netting

## A UK Bass Fishery Management Plan



surveys during August and September (such as those carried out by Derek Goodwin's group in Cornwall), the number found giving an indication of how successful the spawning has been for that year.

The following May & June, these surveys assess how well the '0' groups have survived their first winter and become '1' groups, the juvenile bass being susceptible to prolonged very cold spells.

The success of each year's spawning, and its first-winter survival, determines the strength of the so-called 'Year Class' for that year. It can be seen from the above, that this is very dependent on environmental conditions.

'0' group, or 'young of the year' bass can also be found in rock pools on the open coast (for example in Dorset). It is not known how widespread this phenomenon is, or how much of a contribution it makes to stocks, but it could act as a buffer if there is a problem in the usual nursery areas.

### BASS Science Group - February 2021

With special thanks to Abi Carroll MSc

#### Information sources.

Population Dynamics of the European Sea Bass (*Dicentrarchus labrax*) in Welsh Waters. Abi Carroll. MSc Marine Environmental Protection Thesis Bangor University 2013 - 2014.

Sea Bass. Biology, exploitation and conservation. 1994. GD Pickett and MG Pawson.

Life with Bass. 1998. DF Kelley.

Migrations, fishery interactions, and management units of sea bass (*Dicentrarchus Labrax*) in Northwest Europe. MG Pawson et al. ICES Journal of Marine Science. 2007.

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 Beraud et al.

BOFFFFs: on the importance of conserving old-growth age structure in fishery populations ICES Journal of Marine Science. 2014. Hixon et al.

MAFF Fisheries Research Technical Report Number 99: Biogeographical identification of English Channel fish and shellfish stocks. MG Pawson.

Animal Diversity Web page [https://animaldiversity.org/accounts/Dicentrarchus\\_labrax/](https://animaldiversity.org/accounts/Dicentrarchus_labrax/)

Personal observations from juvenile bass surveys in Cornwall (D Goodwin/R Bradley) and from angling in Cornwall (R Bradley) and Dorset (M Ladle).

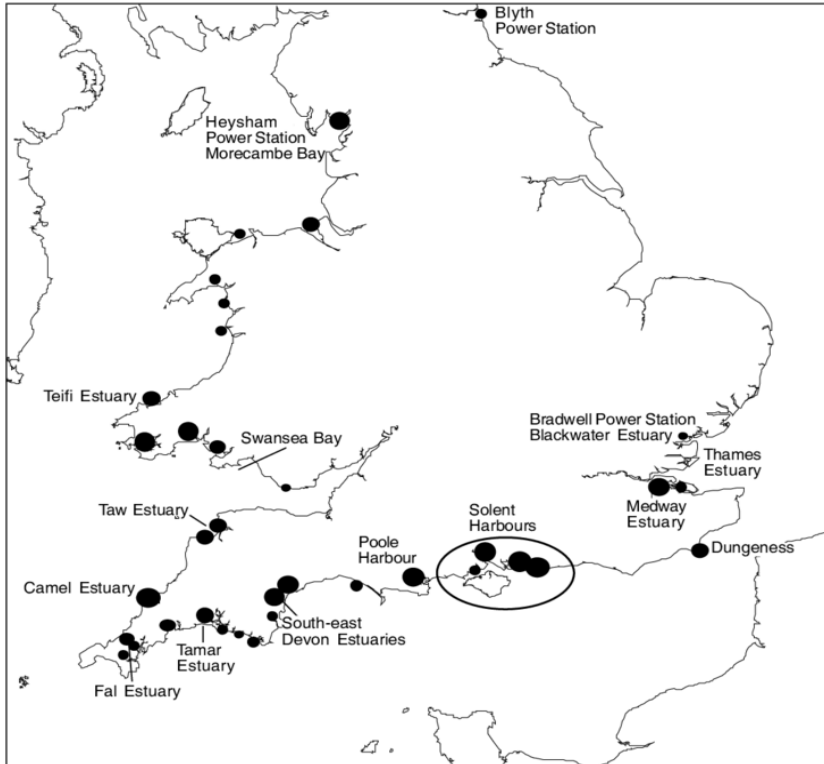
Average number of young produced by three different sizes of European seabass <http://www.piscoweb.org/gallery/european-seabass-reproduction>.



An '0' group bass in early July.

## Nursery Story

The juvenile phase of the bass life cycle is most often lived out in sheltered inshore environments and for this reason shallow coastal lagoons and estuaries are of vital importance to the production of the succession of recruits to the UK bass stock. In recognition of the vulnerability of juvenile bass within these dynamic ecosystems, fishing for bass from any vessel, as well as fishing for any species of sea-fish using sand eels as bait, is prohibited by law in 37 separate areas for all or part of the year.



The counties of Hampshire, Devon and Cornwall and the coast of South West Wales are particularly rich in suitable nursery habitat. In many respects these Bass Nursery Areas (BNAs) are the engine that drives recruitment to the adult bass stock and the future success of the fisheries, which rely on bass for the recreation, food and varied socio-economic benefits. But these can also be hostile environments and young bass can often be prone to starvation, high salinity and temperature fluctuations and predation in their first few years of life. The nursery can be a hostile sanctuary.

BNA locations. *Surveying fish populations in the Solent and adjacent harbours*  
G.D. Pickett M. Brown Cefas Lowestoft

***The characteristics of an estuary is indicative of its potential as a BNA (Pickett and Pawson, 1994) with the distribution of sea bass in estuaries related to salinity and depth (Kelley, 1988) and habitats like saltmarsh are important for juvenile sea bass (Colclough et al., 2005; Fonseca, 2009).***

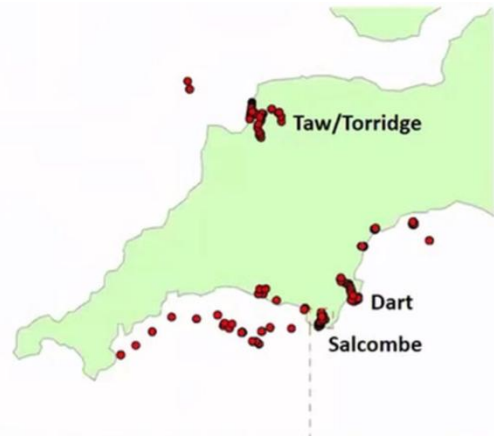
Given the significance of BNAs to bass production, it is important to understand the relationship between the juvenile bass and these ever-changing saline environments. What the young bass feed on, the specific habitats they most frequent and the movements of the young bass within the BNA.

***There is evidence that there is strong site fidelity of 0-group sea bass to specific areas of saltmarshes in the upper end of estuaries, so protection of these areas is likely to be beneficial (Laffaille et al., 2001; Colclough et al. 2005; Fonseca et al., 2009; Green et al. 2012).***

***Small sea bass move onto areas of saltmarsh during the flood tides and return to deeper areas during the ebb (Laffaille et al., 2001). However, it is unclear exactly how larger juvenile sea bass use nursery areas despite stylised representations being available***

*Presence of European sea bass (Dicentrarchus labrax) and other species in proposed bass nursery areas Cefas*

**I-BASS** Funded by the European Maritime and Fisheries Fund (£241,000), the Immature Bass Acoustic Stock Surveillance (I-BASS) project investigated how European bass use nursery areas through the tagging of juvenile bass and installation of acoustic arrays in three bass nursery areas in the southwest of England. The River Dart, The Salcombe Ria (tidal inlet) and the Taw and Torridge estuaries.



The research project assessed the effectiveness of different nursery areas at protecting immature bass from capture within commercial fisheries, and helped to identify habitats or features which are of importance to bass development.

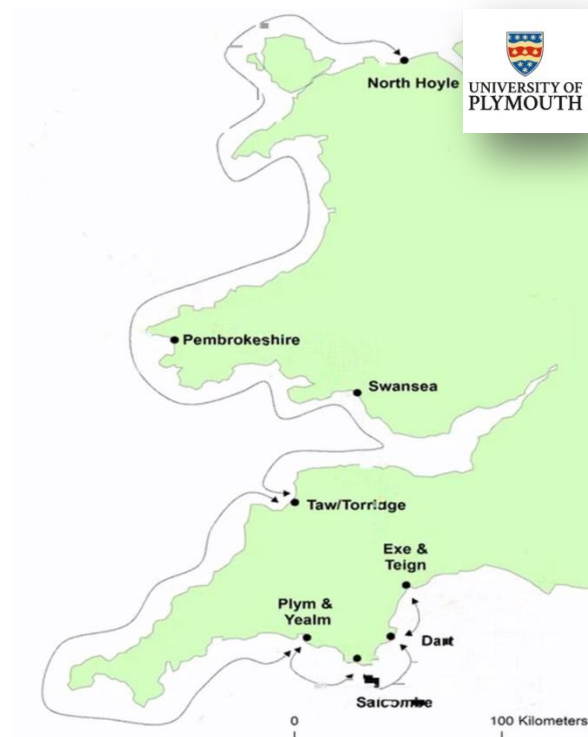


208 juvenile bass which, having been caught on rod and line, were then fitted with an acoustic transmitter by surgical insertion into the body cavity of the fish. When released back to the BNA their movements within and around their home nursery areas were tracked with acoustic telemetry to reveal that juvenile bass were found to be resident to their host BNA for ~75% of the year, though did make wide

ranging movements between neighbouring and distant BNAs. For example: tagged bass were tracked from the Dart estuary to Pembrokeshire - a distance of 590km and a Taw / Torridge fish was tracked to North Hoyle, North Wales - an estimated distance of 570km.

This is the first time that the exchange of juvenile bass, between both neighbouring and distant BNAs, has been evidenced and raises the question to whether sufficient protection is afforded to juveniles by current BNA boundaries, which when initiated in 1999 were often set without any supporting evidence to the extent to which the juvenile bass were mobile. Clearly, if juvenile bass use coastal routes to navigate between BNAs, not only should the BNA boundaries be reviewed but the creation of 'blue corridors' could be an important part of the existing BNA protection network.

*All images courtesy of University of Plymouth, I-BASS Project & Fish Intel*



## The Benefit of BOFFFs

Our fundamental position is that we first of all need a concerted effort to rebuild bass stocks, back up to where they were before commercial overfishing caused the decline in the bass spawning stock, reducing it to the lowest levels within living memory\* and causing the imposition of the current set of emergency management measures, to save the bass spawning stocks from collapse. So let's take a look at one of the spawning stock misconceptions and debate what a suitable solution might be.

### Size is everything

It's noticeable that spawning-stock biomass is almost always regarded as being reproductively the same, no matter what its size composition. Many small young females are wrongly (in our view) assumed to contribute the same to stock productivity as an equivalent mass of what fisheries scientists call BOFFFFs (big old fat fecund female fish) – which are large, older, female fish that are at the peak of their reproductive capacity. These are now relatively rare within the spawning stock.



*A large female bass. BOFFFFs: good for the stock biomass and anglers*

Consequently, BOFFFFs are routinely harvested commercially with no more regard than smaller, less productive fish. However, recent science shows that there are a number of ways in which BOFFFFs can be protected from exploitation and this in turn would improve the productivity and the stability of the stock.

### Slot size and reserves

Two examples are slot limits and marine reserves. The Isle of Man is very much forward-thinking in this regard and has a Legal Retention Slot Size for bass of 50cm - 60cm already in place for its recreational fishery. This not only ensures that BOFFFFs are protected, it also ensures that any fish removed from the spawning stock biomass will have had the chance to spawn at least once, since a bass of 50cm is certain to be sexually mature for at least one breeding season.



However, the current UK Minimum Conservation Reference Size of 42cm is not sufficient to ensure that harvested fish will have spawned with the same degree of certainty.

Establishing a carefully selected network of no-take marine reserves could help in two further distinct ways.

- Firstly, marine reserves provide a sanctuary and ensure that BOFFFFS survive throughout their natural geographic range, when the reserves are located correctly and are numerous enough.
- Secondly, marine reserves are known to “seed” surrounding areas by dispersal of young fish and of course, other marine organisms as well. Implementing both of these measures for bass would undoubtedly improve the spawning stock biomass (currently around 50% of the estimated levels of 1985\*) which would be advantageous for all stakeholders in the bass fishery.

### **Supported by the science**

The importance of large female fish within a stock biomass was first reported well over 100 years ago (*Hjort 1914*) but it is only relatively recently that scientists are starting to understand and fully appreciate how important such fish actually are.

In a great many fish species, including European bass, BOFFFFs produce more and very often larger eggs compared to smaller but mature sized fish and once hatched, the offspring of BOFFFFs frequently display faster growth and better survival rates.

As can be seen from the graphic on page 10, a European bass that is 80cm in length (approximately 5kgs) produces nearly three times as many eggs as a fish just 20cm shorter and over FOURTEEN times as many as a fish of 40cm (approximately 0.7kgs).

Moreover, BOFFFFs have a tendency towards an earlier and longer spawning season and since large fish are more robust than smaller fish, BOFFFFs can also spawn in locations that smaller fish can't. Thus, BOFFFFs help to ensure individual reproductive success in environments that other fish may not be able to reproduce in.

Similarly, BOFFFFs can survive periods that aren't conducive to successful reproduction and in doing so, enhance recruitment when conditions return to normal. This is termed “the storage effect”. It is also known that removing BOFFFFs, by using non-selective fishing methods for example, destabilizes fished populations and increases susceptibility of collapse even after fishing effort is later reduced, further illustrating BOFFFF importance to populations.

So, one can see why it is critically important that as many BOFFFFs remain part of the spawning-stock biomass as possible in order to maximise recruitment.

A Bass Fishery Management Plan would do well to take into account that BOFFFFs are an important element of the stock biomass that can benefit the stock, bass anglers and all fishers alike.

### **References:**

*Hixon et al, ICES Journal of Marine Science, Volume 71, Issue 8, October 2014, Pages 2171–2185*  
*Lavin et al, Proc Biol Sci. 2021 Mar 10;288*

*\* ICES/CIEM advice on sea bass for areas North Sea, English Channel, Irish Sea, Bristol Channel, Celtic Sea 2022. see page 7*

## MSY? ... Try MEY

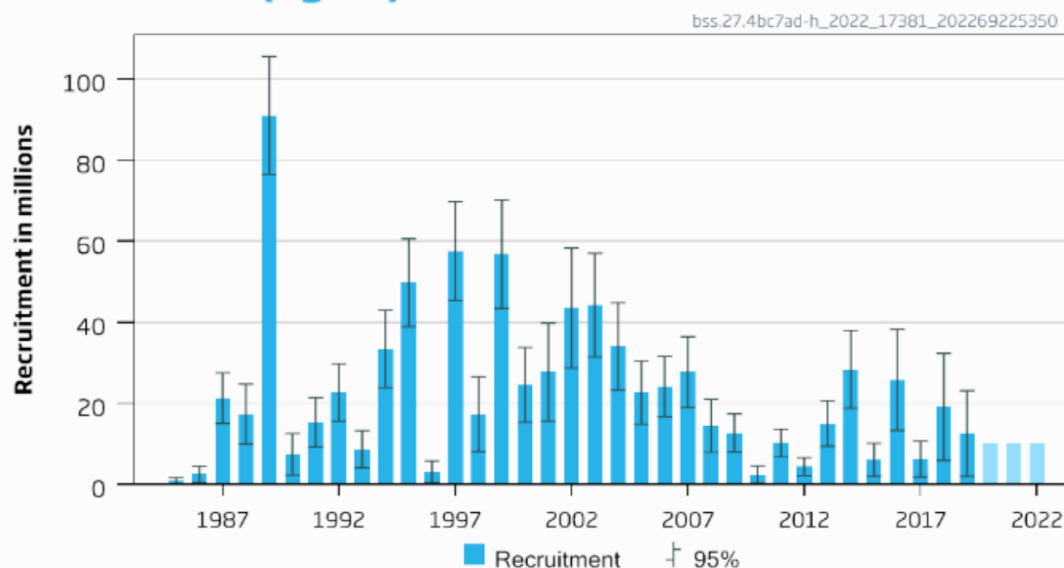
Maximum Sustainable Yield (MSY) vs Maximum Economic Yield (MEY)

We have seen how years of managing bass stocks at an EU-wide level, where MSY is the default fisheries management objective, has coincided with a decline in the bass stock, since around 2008. In more recent years, following the advice of ICES in 2015, recovery measures been in place and it is only now that the bass SSB appears to be on a very modest upward trend. The 2021 ICES advice report for bass indicates that the SSB is now only just above  $B_{lim}$  and at approx. 50% of the estimated SSB levels of 1985. The SSB still needs to be restored to reach a safe level and a continuation of MSY objectives, coupled with poor recruitment years, could reverse the already fragile green shoots of recovery that are beginning to appear.

A bass SSB that is below safe limits is highly likely to also have a negative effect on recruitment to the adult bass stock, manifesting in a cycle of insufficient adults, rendering the stock incapable of producing sufficient young to replenish those taken by fishing and natural mortality. The 2021 ICES annual stock assessments for bass have shown that, in the preceding 12 years, recruitment at age '0' has, on average, been markedly lower than for the three previous decades.

There have been no 'bumper' year classes, as there were in 1989, 1995, 1997, 1999, 2002 and 2003 in nearly two decades, despite favourable climatic conditions. These strong year classes previously acted as a buffer for poor year classes (1985, 1986, 1996, 2010) and, perhaps due to overfishing, there have been no notably strong year classes entering the fishery since the early years of the twenty first century.

### Recruitment (age 0)



ICES / CIEM advice on sea bass for areas North Sea, English Channel, Irish Sea, Bristol Channel, Celtic Sea 2022

Indeed the validity of using MSY as an objective has been hotly debated by many fisheries scientists:

***The MSY concept is often criticized by aquatic ecologists who believe that this single-species construct stands in the way of ecosystem-based fisheries management (EBFM) or one of its variants***

ICES Journal of Marine Science, Volume 78, Issue 6, September 2021

If the MSY limits are set too high, or worse, become targets for levels of extraction, overfishing of a stock may result and this appears to have happened to bass stocks, but from two different causes: Growth Overfishing and Recruit overfishing.

***Types of overfishing***

***Conventionally, there are two types of overfishing relating to population growth and recruitment. 'Growth overfishing' is a situation where the fish are being caught at too high a rate to allow optimum growth, hence depressing the potential yield. 'Recruit overfishing' occurs where the spawning stock biomass has been reduced to a level where insufficient recruits are produced to support a fishery.***

*Guide to Fishing at Maximum Sustainable Yield (MSY) Seafish February 2022*

Renowned marine biologist Daniel Pauly has suggested that MSY is too often used incorrectly:

***" In principle, most fisheries scientists and legislations agree that MSY should be a limit, and not a target for fisheries management because if it were a target, this target would be exceeded about half of the time just because of uncertainties in estimation and application, resulting in overfishing and stock decline.***

***This implies that target catches should be set below and target biomass above the MSY level.***

***Also, at biomass levels of, for example, 60 per cent or more of carrying capacity, populations are much more capable of fulfilling their ecological roles than at the currently common 30–40 per cent levels, while at the same time supporting good catches."***

*Seas Around Us - Fisheries, Ecosystems and Biodiversity, Jan. 2021 University of Western Australia*

## **Is Maximum Economic Yield a Better Objective?**

So, would MEY be a better management objective for UK bass stocks going forward?

***Maximum Economic Yield (MEY) is the value of the largest positive difference between total revenues and total costs of fishing (including the cost of labour and capital).***

***Typically, mortality rate FEY is slightly below FSY, resulting in marginally less than the maximum sustainable yield. However, much less fishing effort is used, with fewer associated costs, to take the maximum economic yield, and higher biomass levels reduce fluctuations in fishing opportunities. Consequently, it is an economically attractive option, i.e. a cheaper way of ending up with almost the same amount of fish. It is also environmentally more desirable as it reduces environmental pressures such as engine emissions and negative impacts on the wider marine environment.***

*Pew Trust: MSY for Dummies. OCEAN2012 Transforming European Fisheries*

## Bass Economics

The evidence strongly suggests that there is enormous potential to create a UK bass fishery where associated jobs and revenue can be derived from bass angling tourism, generated and retained within our coastal communities. Southern Ireland has already seized this opportunity and many anglers from around the globe visit Eire to experience the world-class bass fishing that is on offer.

In 2015, within the *National Strategy for Angling Development, the Economic Value of Bass and Sea Angling in Ireland* was researched by Tourism Development International (TDI), concluding that:

**An estimated 33,000 overseas anglers, who identified as fishing exclusively for bass, spent between €28 million and €34 million in pursuit of bass**

*NB: Ireland has a policy of only allowing angling for bass and has no commercial bass fishery*

## English and Welsh Government Sea Angling Surveys

In 2000 Nautilus Consultants Ltd in association with EKOS Economic Consultants Ltd prepared a report for the National Assembly for Wales entitled: *A Study into Inland and Sea Fisheries in Wales*.

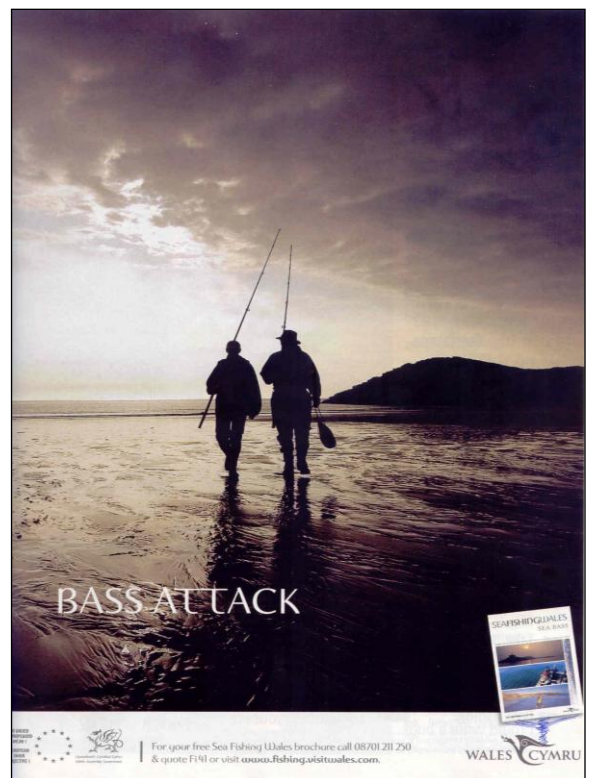
The study found that sea angling in Wales attracted 12,000 resident anglers and 28,000 visiting anglers. Sea angling made a gross annual contribution to the coastal economy of Wales of over £28 million and employed 471 persons.

In 2004, at the behest of Defra, BASS put forward a comprehensive *Bass Management Plan*, in which we posed the question -

*"What would be the most effective way of maintaining, and increasing the best economic value for this resource for Wales? It would appear that the answer lies in proactive management, protection and conservation of marine fish species targeted by sea anglers in inshore waters, especially bass."*

At the same time promotional adverts were appearing in national sea angling magazines, which focused on attracting sea anglers to come bass fishing in Wales.

So, the combined economic values of the leisure and tourism sectors, which can provide much needed employment opportunities for coastal communities, can be harnessed through a better understanding and utilisation of this species of fish and the opportunity that the creation of a bass FMP presents, should be grasped with both hands, before the fish 'that lays the golden egg' is allowed to fall so far beyond recovery that the potential benefits are squandered.



Sea Angler Magazine, September 2004

## English and Welsh Government Sea Angling Surveys - cont

In March 2004 **Drew Associates** released the *Research into the Economic Contribution of Sea Angling* report, which was commissioned by the Economics and Statistics Group of **Defra**.

The 82-page report presented a number of statistics:

- 1.1 m households contained at least one member who had been sea angling in the last year
- Most anglers were male (96.7%) and had been sea fishing for 25.7 years on average
- Anecdotal evidence suggested a growth in sea angling tourism by UK nationals ( Channel Islands, Ireland, USA, Africa ) where fishing opportunities were better.
- The great majority of those interviewed perceived a positive benefit to their health through sea angling
- Consumer surplus benefits of sea angling were found to be considerable, between £602 m and £1,300 m combined for shore anglers, own boat anglers and charter boat anglers.
- Sea angler spending translated into 18,889 jobs and £71 m in suppliers' income
- Sea Angling was enjoyed across a wide spectrum of social classes
- 71% of anglers perceived a decrease in the number of fish caught over the previous 5 years and 62% in fish size
- As compared with commercial fishing the impacts on the resources was insignificant
- 'Sea Angling contributed to the overall level of fishing mortality, but with increasing trends towards catch and release, this small level of mortality is now decreasing'



And from *Charting Progress 2 - The state of UK Seas*  
UK Marine Monitoring and Assessment Strategy 2010

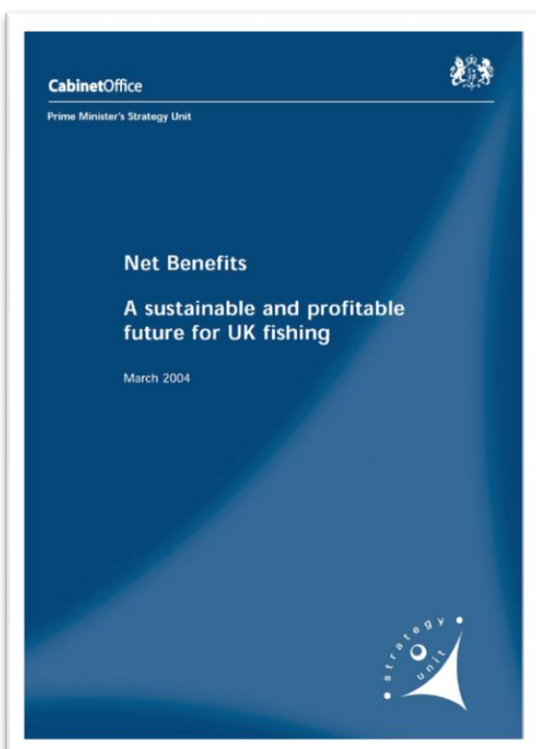
**The most popular sea angling species to target is bass, with nearly half of all sea anglers choosing this as their main target species.**

**The value of the bass sport fishery in 2004 is estimated to be in excess of £100m p.a. despite severely depleted stocks of larger bass**

## English and Welsh Government Sea Angling Surveys - cont

**Net Benefits:** Whilst not a survey on sea angling per se -

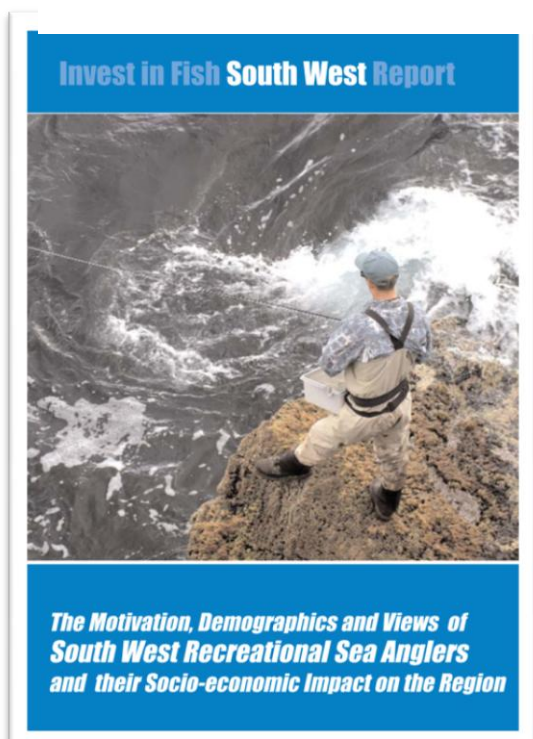
This comprehensive report on the future of UK fishing was compiled by the Cabinet Office of the Prime Minister's Strategy Unit in March 2004. Sea angling was not extensively represented within the report, because the sea angling sector was not then recognised as a valid sector of the fishing industry. As part of its recommendations the report suggested:



***Management to maximise opportunities for recreational anglers means reducing commercial fishing pressure to allow species such as bass, favoured by sea anglers, to grow to a much larger size.***

***Fisheries departments should review the evidence supporting arguments for re-designating commercially caught species for wholly recreational sea angling, beginning with bass, by the end of 2004.***

### ***The Motivation, Demographics and Views of South West Recreational Sea Anglers and their Socio-economic Impact on the Region:***



***The most popular species to target is bass, with nearly half of all sea anglers choosing it as their favourite***

***We find that the catch of the angler's favourite species is an extremely important attribute, until catch levels reach around six fish per day. Current catch levels are 2.5 per day for trips targeting bass***

***Management policies should aim to increase the size of fish as well as the number of fish caught***

***Sea angling in the South West generates £165 million of expenditure within the region each year***

***We estimate that over 3000 jobs are linked to sea angling in the South West***

## English and Welsh Government Sea Angling Surveys - cont

*The Sea Angling Diary Project*, launched in 2016, is delivered by Substance in conjunction with Cefas and is an ongoing survey of sea angler participation, spending and societal benefits.

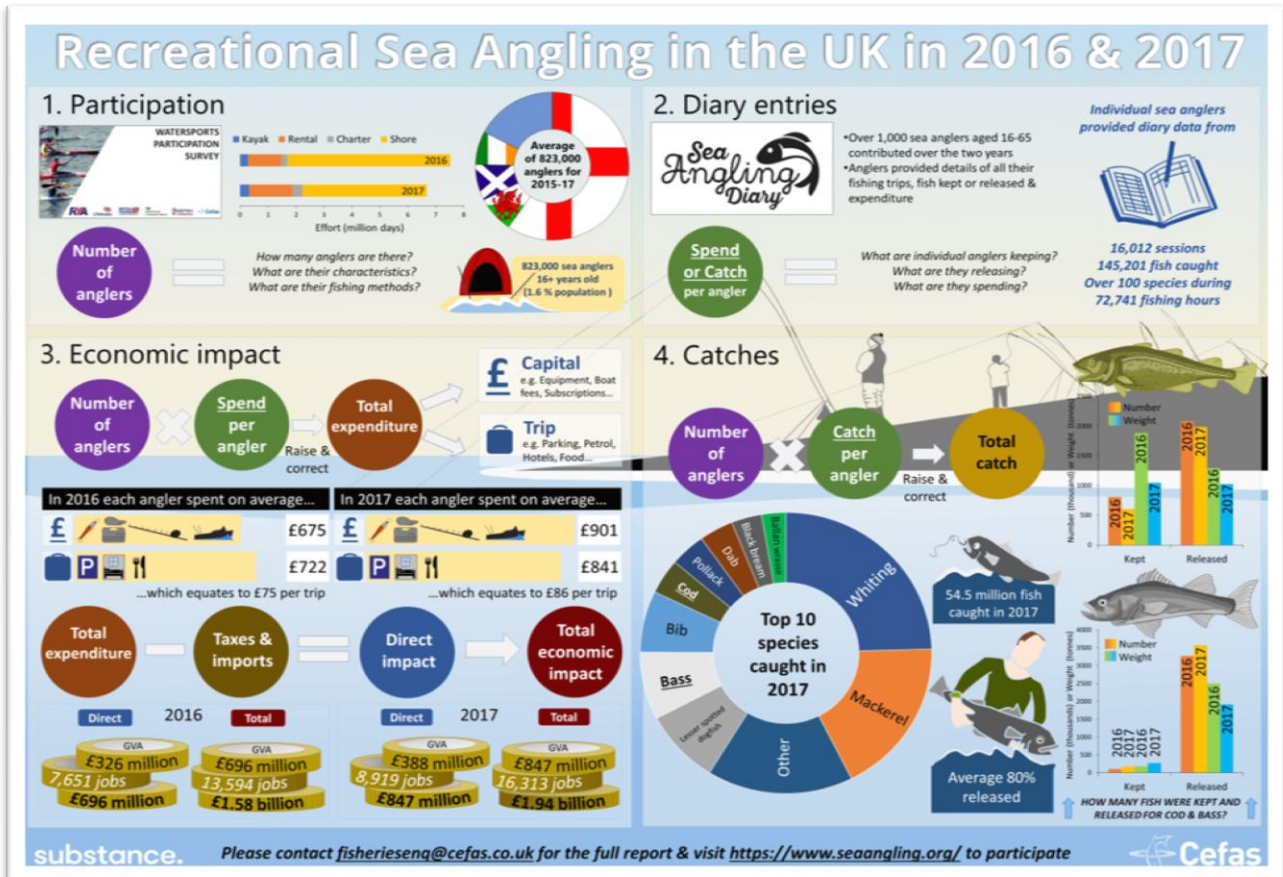
*"The Sea Angling Diary Project is for English and Welsh sea anglers to help improve the sustainable management of marine stocks and demonstrate the value of sea angling."*

*"It has helped to report the activity, catches and economic and social value of recreational sea angling since 2016 which is used to inform better decision making about sea angling's future. Over 2,000 sea anglers participate each year."*

### Report summaries

- 823,000 of 16+ years of age went sea fishing during 2015 - 2017
- 2016 - total expenditure by sea anglers = £1.58 billion
- 2016 - total jobs supported by sea angling = 13,594
- 2017 - total expenditure by sea anglers = £1.94 billion
- 2017 - total jobs supported by sea angling = 16,313
- 2017 - sea anglers in England and Wales released 80% of the bass that they caught
- 2018 - sea angling generates income in coastal communities, so may be lost to these vulnerable communities if it was spent on non-coastal leisure

*Infographic summarising data from the Substance / Cefas Sea Angler Diary Project 2016 to 2019*



Bass are one of the most valuable sea fish caught in UK waters, but 'value' comes in many different forms.

As we have demonstrated in the previous pages, the highest attainable value, in terms of gross expenditure and the lowest impact user of the UK bass resource, is recreational exploitation, with between €188m and €282m spent by anglers on bass angling annually and with 80% of their catch being released (C&R).

The societal value, in terms of health and well-being, is also a strong 'value factor' in angling for bass and has only very recently been acknowledged, with angling being one of the few sports encouraged during the 2020 Covid-19 lockdowns.



*In 2017 sea anglers' total economic impact was £1.94 billion and they released 80% of the bass that they caught - Cefas Sea Angler Diary Project*

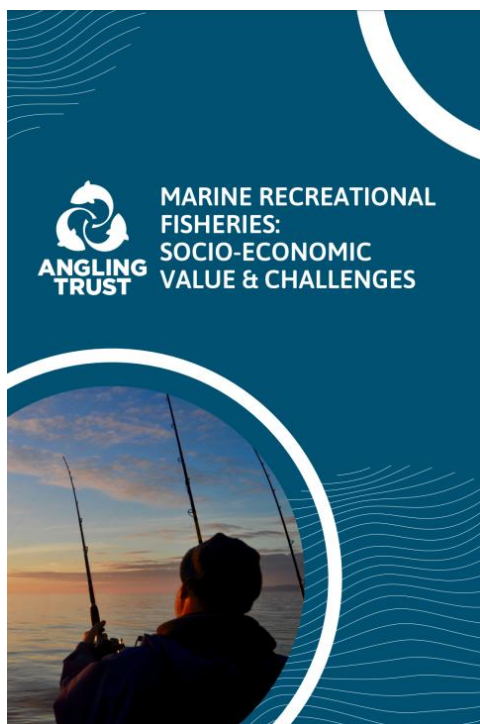
Within the commercial bass fishery, H&L provides greater value than netting, with H&L caught fish commanding a premium of some 20% to 30% more than net-caught bass. This value uplift is due to the selectivity, exclusivity, higher quality and traceability of the product, from boat to plate, when carcass tags are used. There is empirical evidence to suggest that some unscrupulous netters pass off their bass as 'line caught' in order to secure the higher price premium and exceed landing limits.

When large landings of net-caught, migrating bass hit the fish market, the price of bass drops dramatically, not only reducing earnings for other fishermen but the future value of the bass stock, to the UK's coastal communities, is also greatly diminished.



Large hauls, comprising of migrating pre-spawning bass, not only deprives the stock of mature adult fish and their reproductive capacity, but also depresses market prices and reduces profits for more sustainable fishers such as H&L and recreational bass angling businesses.





In its June 2022 report '*Marine Recreational Fisheries: Socio-Economic Values and Challenges*', the Angling Trust (AT) lays out the compelling case for the value of sea angling to be recognised as follows:

***Marine recreational fisheries have been demonstrated to be a high-value activity whereby individuals within the sport spend significantly\*, such as on fishing tackle, boats, licenses, travel, and accommodation (Pita et al., 2018).***

***Between 2012-2013, the average angler spend on trips and major items alone was nearly £1500 a year\****

***Estimating the economic contribution of the sport to the broader economy is essential for proportional representation within sustainable fisheries management of inshore fish stocks and other policy matters such as tourism management and economic development\****

*\*(Roberts et al., 2017).*

"A 2020 study by Williams et al. assessed the economic contribution of charter boat sea angling for four ports in Dorset (Poole, Swanage, Weymouth and Portland) to estimate a cumulative economic impact to Dorset of £2.4 million in gross output as a result of recreational angling charter boat activity. The total estimated financial contribution was £3.6 million with over £1.3 million of Gross Value Added (GVA). The **New Economics Foundation** identified that the recreational charter fleet in Poole Harbour is significantly greater in economic contribution than either the commercial fishing or aquaculture sectors in the same harbour (Williams and Davies, 2018)."

**The Social Benefits of Recreational Sea Angling** The AT's report concludes: "There are many social benefits of recreational sea angling, such as experiencing nature, spending time with family and friends, improved health and wellbeing, and environmental conservation (Hyder et al., 2020). Sea angling is also a focal point within many vulnerable and marginalised communities within the UK, providing access for socio-economically deprived groups to the multitude of benefits that sea angling brings. These social benefits deliver impacts on personal and community development, tourism and education, benefitting local and national economies and are relevant to the government's Levelling Up strategy." Access to waters that hold specimen salmon, trout, carp (and many other desirable species) is far beyond the financial means of the vast majority of anglers. However, a well managed bass fishery will be accessible to all anglers, regardless of their social standing or income.). Angling is an important way to connect with nature (Hunt, Richardson, and Hamlin, forthcoming, 2022). 69% of sea anglers have said it is an important way to experience nature and wildlife (Armstrong et al. 2013), and sea anglers rate access to a healthy and beautiful marine environment as a critical motivating factor (Brown et al. 2019). Sea angling enables participants to access the numerous benefits associated with a 'blue mind and blue health' through spending time by the ocean, with 70% of anglers saying it helps them deal with stress (Brown 2019), for example.

***"Angler satisfaction, the psychological reward an angler receives from their experience and affects how anglers behave, should be an essential consideration for recreational fisheries managers" (Birdsong et al., 2021)***

## The Recreational Bass Economy and its Hidden Value

Many people have centred their businesses and livelihoods entirely around bass - from guiding anglers who want to catch bass, to supplying fishing tackle aimed exclusively for catching bass, art, photography, clothing suppliers and those within the tourism industry, who offer accommodation centred around providing anglers who fish for bass with board and lodgings. Anglers who fish for big bass are prepared to travel around the country, or even abroad, in search of good bass fishing.

### BUSINESS OWNERS WHERE BASS IS CENTRAL TO THEIR LIVELIHOOD



**Henry Gilbey** - Writer and photographer  
Cornwall



**John Quinlan**  
Fishing lodge owner



**David Miller** - Artist  
Pembroke



**Martin Donald**  
Charter boat skipper  
W. Sussex



**Orkney Boats**  
Arundel



**Marc Cowling** - Bass guide  
South Devon



**Hand carved bass lures**



**Zziplex BASS rods**  
Kent

There have been numerous studies conducted into the economic values of sea angling and recreational angling for bass:

- **2000 - Nautilus Consultants Ltd -**  
Sea angling made a gross annual contribution to the coastal economy of Wales of over £28 million and employed 471 persons.
- **2004 - Drew Associates -**  
Consumer surplus benefits of sea angling between £602m & £1,300m
- **2004 - Net Benefits recommendation -**  
Fisheries departments should review the evidence supporting arguments for re-designating commercially caught species for wholly recreational sea angling, beginning with bass by the end of 2004.
- **2005 - Invest in Fish South West -**  
Sea angling in the South West generates £165 million of expenditure within the region each year. We estimate that over 3000 jobs are linked to sea angling in the South West. Our best estimate of consumer surplus for Southwest resident anglers is £77m.
- **2014 - Blue Marine Foundation -**  
The final economic output per tonne of bass retained in Sussex is almost 40 - 75 times higher for recreational bass fisheries than for commercial bass fisheries.  
The employment generated per tonne of bass retained is 39 -75 times higher for recreational bass fisheries than for commercial bass fisheries.
- **2010 - Charting Progress -**  
The value of the bass sport fishery in 2004 is estimated to be in excess of £100m p.a. The most popular species for sea anglers is bass.
- **2015 - Inland Fisheries Ireland -**  
Total Contribution of Irish Bass Recreational Fishery to Irish Economy: € 52 million. An estimated 33,000 overseas anglers, who identified as fishing exclusively for bass, spent between €28 million and €34 million in pursuit of bass
- **2017 - Cefas / Substance -**  
total expenditure by sea anglers = £1.94 billion, total jobs supported by sea angling = 16,313. Sea anglers in England and Wales released 80% of the bass that they caught
- **2021 - European Market Observatory for Fisheries and Aquaculture Products -**  
UK recreational angling expenditure on bass fishing calculated to be between 188 and 282 million Euros compared to commercial first sale value of 5.3 million Euros

***For two decades, this contribution to the UK economy has been known, yet despite the fact that sea angling supports an estimated 16,000 UK jobs, many in coastal areas, not one piece of fisheries legislation has been enacted to specifically enhance the species of fish of importance to sea anglers.***

Indeed, even within the draft Joint Fisheries Statement, recreational sea angling warrants only two short paragraphs and is referred to in terms of a competing impediment to commercial fisheries, rather than the key economic driver that it is and the health and social benefits that it provides.

#### 4.2.15 Recreational Sea Fishing



- 4.2.15.1 The fisheries policy authorities will continue to work together - where possible, practicable and appropriate - to ensure recreational sea fishing is environmentally, socially and economically sustainable. We will aim, where possible, to take account of recreational sea fishing in wider fisheries management.

## Bass at Westminster

There have been a number of Parliamentary debates on the bass fishery in recent years, the most comprehensive of which was sponsored by **George Hollingbery MP** and took place on the 3rd December 2014. Two previous Fisheries Ministers took part in the debate and their contributions are particularly telling (*source: Hansard*):

**The Rt Hon Ben Bradshaw (Exeter) Under Secretary of State from 2003 to 2006  
Minister of State for DEFRA from 2006 to 2007**

*It is far better to make tough decisions now. If the Minister caves in to the self-appointed representatives of the commercial sector, our bass fishery will be doomed.*

*Proposals by the Commission are not wholly inadequate, but imbalanced in favour of the commercial sector and against the recreational sector. One of the first tasks is to rebalance those proposals in the other direction.*

*We know for a fact that recreational bass fishing is worth far more to the economy than commercial fishing, and is a great deal more sustainable.*

*It is also worth noting that the VAT receipts alone from the wealth and activity generated by sea angling dwarfs the income from the commercial sector.*

**Lord Richard Benyon Parliamentary Under Secretary of State from 2010 to 2013  
Parliamentary Under-Secretary of State for Rural Affairs and Biosecurity 2021 to present**

*The story of the management of this stock has been a very bad one indeed. The high point was the decision by the Rt Hon Member for Exeter to increase the minimum landing size and all credit to him for taking it*

*I take an old-fashioned view that fish should not be harvested until they have had a chance to breed. It is the spawning biomass that is crashing and it is on that issue that action needs to take place*

*I suspect that we will hear later today the words "long-term economic plan". Well let us just look at the economics of the issue that we are talking about. In Sussex alone, I calculate - from figures in the MRAG (Blue Marine Foundation) report ... between 258 and 276 tonnes of fish (bass) were harvested commercially in 2012 and somewhere between 10 and 19 tonnes were harvested recreationally*

*Taking the median of those two about 5.7% were landed from the recreational sector. However, what is really important is that the economic output per tonne in Sussex is 40 to 75 times higher for recreational than commercial*

*The employment that is generated, calculated per tonne, is 39 to 75 times higher for recreational bass fisheries than commercial. That is a staggering difference.*

*I urge the Minister to look at what has happened in Ireland where there is a recreation-only fishery, a strict catch limit and a high minimum landing size. People (anglers) who go there are welcomed and find charter boats linked to pubs and hotels ... the whole package*

*I want those fishermen to go to Devon, Sussex and Essex and exploit this exciting game fish*

## Bass Management Tools

- Landing Limits (commercial sector)
- Bag Limits (recreational sector)
- Closed Seasons for Retention
- Bass Nursery Areas (BNAs)
- Licensing for Bass Retention
- Catch and release (recreational & H&L)
- Gear Restrictions
- Spatial Closures
- Carcass Tagging
- Slot Sizes

There is one other fisheries management tool that is sometimes employed - A moratorium on removals. Considered to be the 'nuclear option' in fisheries management, it has been used when fish stocks have crashed and no other viable alternatives are deemed suitable ... this is often the last throw of the dice for a fish species' survival, for example, the moratorium in 2010 of the Italian industrial purse seine for Atlantic blue fin tuna.

### Case study:

The Atlantic coast migratory striped bass (*Morone saxatilis*), has supported important recreational and commercial fisheries in the USA, from Maine to North Carolina for centuries. Steady declines in the abundance of striped bass in the 1970's evidenced through commercial landing data, raised serious concerns about what was happening to the populations of this species.

The primary reason for the serious decline in striped bass populations was over-fishing. To allow the striped bass to recover, various coastal states implemented restrictions ranging from total moratoriums on fishing of all kinds, including angling, to highly restrictive limits on fish retention size, quota and bag limits. The Atlantic Striped Bass Conservation Act 1984 allowed the federal imposition of a moratorium on striped bass harvest in states which failed to implement striped bass fisheries management plans.

By 1989 there was evidence that the striped bass had responded well to the restrictions and that populations were beginning to recover. As such, a transitional fishery commenced in 1990, but with severe penalties and high profile enforcement for transgressors. Restaurants illegally selling striped bass were fined heavily and fishers who were caught landing striped bass illegally had boats and pick-up trucks confiscated with a hefty fine on top for good measure.

<https://ftw.usatoday.com/2020/04/anglers-nabbed-with-illegal-striped-bass-haul-face-steep-fines>

As part of the overall recovery plan recreational anglers successfully convinced the legislators that all future management and recovery programs for striped bass should take full account of the socio-economic importance and impact made by sport anglers fishing for striped bass.

It was becoming clear that the value of a striped bass in economic terms was significantly more than that of a fish landed on the market from a commercial vessel. Management plans factored in this information, such that striped bass are now managed primarily for recreational amenity, which provides significant local, regional and national economic gains.

**Bass Management Tools - in current use**

<b>Current Bass Management Tools</b>	<b>Current</b>	<b>Options Modifications</b>	<b>Advantages</b>
<b>Minimum Conservation Reference Size (MCRS)</b>	42cms - Equal to first size of maturity for female bass = a max of only 1 spawning cycle.	Increase MCRS* to ensure a higher % of females spawn at least once = 50cm MCRS	Enhance SSB to replenish stock Create a more natural stock profile Increase the value of each fish Encourage RSA activity
<b>Landing Limits (commercial sector)</b>	Netting - by-catch only, 5% of catch per trip, 760 kgs x2 cm. Trawls & seines 5% Hook & Line - 5.95t pa Fixed nets by-catch of 1.5t per year	Ensure enforcement of bycatch limits ( 100% bycatch in some cases!) Incentivise switch to Hook & Line	Phase out unsustainable capture methods and encourage and incentivise sustainable capture.  Selective = Sustainable = Valuable
<b>Bag limits for Recreational Sea Anglers (RSA)</b>	2 bass per angler in any 24 hour period	3 bass per angler in any 24 hour period	Encourage participation and associated RSA expenditure. Fresh, healthy food for the family
<b>Closed Seasons for Retention (commercial)</b>	1st Feb to 30th March (2 months)	1st Dec to 30th March (4 months)	Enhanced protection for pre-spawning bass aggregations Parity across both sectors
<b>Closed Seasons for Retention (RSA)</b>	1st Dec to 29th Feb (3 months)	1st Dec to 30th March (4 months)	Enhanced protection for pre-spawning bass aggregations Parity across both sectors
<b>Bass Nursery Areas (BNAs)</b>	37 existing BNAs (reviewed in 2021*)	22 new sites identified as possible BNAs**	Enhanced protection for vulnerable juveniles and stock rejuvenation
<b>Licencing for Retention</b>	Authorised by fishing authority	Non-renewal /re-issue when authorised vessel leaves the industry	Cap expansion of exploitation. Reduce exploitation over time Identify bone fide / illegal fishers
<b>Catch and Release (C&amp;R)</b>	Mandatory C&R only for RSAs during closed season period	Encouragement of C&R practice and handling through info/education.	95% survival rate = recycling of the resource and renewable revenue generated for coastal communities
<b>Gear Restrictions</b>	No landings from Pelagic trawls, ring nets and drift nets	Increase mesh sizes for gillnets and decrease by-catch allowance (often abused)	Phase out the use of damaging and unsustainable gear. Re-deploy into H&L or charter / guiding for RSA Increased value and sustainability

\*Incremental increases in MCRS. Staged increase to 46cm in year 1 to 50cm in year 3.

Growth rate of bass approx. 6cm pa "it can take up to 7 years to reach MCRS (42 cm)" (NWIFCA)

\*\*<https://www.gov.uk/government/publications/presence-of-european-sea-bass-and-other-species-in-proposed-bass-nursery-areas>

## Bass Management Tools - unused options

Optional Bass Management Tools	Current	Unused Options	Advantages
Spatial Closures	N/A	Real-time area closures based on landing data via Under 10m app	Protection for pre-spawning aggregations of fish when at their most vulnerable. Avoid localised depletion Enhanced sustainability
Carcass Tagging for Hook and Line	N/A	Already in use by some H&L. Temperature tags	Identification of H&L caught fish Sustainable, Traceable, High quality, Adds significant value
Slot Sizes (combination of MinCRS and MaxCRS )	N/A	Highly selective for RSA and H&L.	Return large fish with highest fecundity potential = enhanced egg production and stock genetics
Use of circle hooks for recreational bait and Hook & Line Fishers	N/A	Avoid deep-hooking of unwanted bass, which can be fatal	In conjunction with slot size limits enable the safe return of unwanted / outside slot size bass

### Slot sizes for species of importance to recreational angling from around the World

State / Country	Species	Legal Retention Slot
<b>Florida USA</b>	Lesser Amberjack	14" to 20"
	Black Drum	14" to 24"
	Permit & Pompano	11" to 24"
	Red Drum ( Redfish)	18" to 27"
	Cubera Snapper	12" to 30"
	Snook	28" to 34"
	Spotted Sea Trout	15" to 20"
<b>Louisiana USA</b>	Red Drum ( Redfish)	16" to 27"
	Black Drum	16" to 27"
<b>Massachusetts USA</b>	Striped Bass (recreational)	28" to 35"
	Striped Bass (commercial)	mls of 35" *
<b>New Jersey USA</b>	Striped Bass (recreational)	28" to 38"
<b>California USA</b>	White Sturgeon	40" to 60"
<b>Kansas USA</b>	Black Bass	12" to 15"
<b>Texas USA</b>	Largemouth Bass	16" to 24"
	Red Drum (Redfish)	20" to 28"
<b>N. Ontario Canada</b>	Walleye	16" to 22"
<b>Queensland Australia</b>	Barramundi	58cm to 120cm
<b>Victoria Australia</b>	Murray Cod	60cm to 100cm
<b>ISLE of MAN</b>	European Sea Bass	50cm to 60cm

A slot limit is a selective tool used by fishery managers to regulate the size of fish that can legally be harvested. "Slot size" refers to a fish within the size limits one can keep. For example, a "slot barramundi" caught in Queensland waters, measuring between 58cm - 120cm may be retained, but anything below 58cm (young adult) may not be kept and any fish over 120cm (BOFFFs) must be released unharmed, as quickly and safely as possible.

Slot Sizes for Retention



Florida USA ~ PERMIT  
slot size 28cm to 61cm



Massachusetts USA ~ STRIPED BASS  
slot size 71cm to 89cm



Queensland Australia ~ BARRAMUNDI  
slot size 58cm to 120cm



Louisiana USA ~ RED DRUM  
slot size 41cm to 69cm



Florida USA ~ SNOOK  
slot size 71cm to 87cm



Isle of Man ~ EUROPEAN BASS  
slot size 50 cm to 60cm



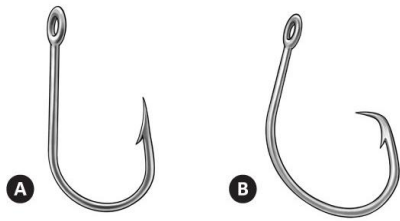
Florida ~ CUBER SNAPPER  
slot size 30.5cm to 76cm



Victoria Australia ~ MURRAY COD  
slot size 60cm to 100cm



## Circle hooks for anglers and H&L, bass fishing with bait



In the above image, A. is a J hook, most commonly used by anglers and H&L commercial fishermen when using bait to catch bass. Due to the design of the hook and the way that bass often aggressively inhale their prey (and bait) the bass are often hooked in the throat or deeper into their gullet. Released fish are less likely to survive if 'deep hooked' especially if prolonged attempts are made to remove the hook.

B. is a circle hook and the design, with the hook point facing back towards the shank of the hook ensures that even if a bass inhales the bait deeply, the hook point does not penetrate the throat or gills, but catches on the edge or corner of the jaw as the line is tightened, making it easier to unhook and release unwanted bass, with higher survival probability.

**In 2006, in California, another study was made of the survival of a popular angler's fish, the 'white sea-bass'. The effectiveness of offset-circle-hooks was compared with J-type hooks. The results showed that the circle-hooks penetrated the lip region more frequently (73%) than did J-type hooks (41%) and confirmed that hook location directly affected mortality.**

*Do circle hooks catch more fish? M. Ladle. April 2022*

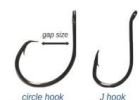
**In Massachusetts state, from Dec 2020, the use of circle hooks has been mandatory when fishing with bait for striped bass as a conservation measure.**



### Circle Hooks Save Fish!

#### Did you know...

- Recreational anglers in Massachusetts catch and release 9 million fish each year!
- Sometimes fish die from their hook wounds after they are released back into the ocean.
- Circle hooks can help lower the number of these kinds of deaths by 50%!



**Why don't circle hooks snag?**  
Circle hooks are designed so that the point is turned back towards the shank at a 90° angle. This causes the hook to catch on the lip or mouth instead of the gut or gills.

#### Using Circle Hooks

- 1 When using live bait, turn the hook through soft flesh or bridle the bait to the hook
- 2 For cut-bait, rotate the piece completely onto the hook to ensure it doesn't fall off
- 3 When the fish takes the bait, be patient and don't set the hook
- 4 Calmly reel the line tight and the hook will do all the work



**Avoid offset hooks**  
Offset hooks are NOT true circle hooks! The offset shape makes it easy to "foul-hook" a fish.

#### What species benefit from Circle Hooks?

Fish that eat by inhaling their food are good candidates for circle hooks. Examples include:

- **Striped Bass**  
hook size: 6/0, 7/0, 8/0
- **Black Sea Bass**  
hook size: 4/0, 5/0, 6/0
- **Tuna Species**  
be sure the gap on the hook you select is large enough to fit around the lip of your target fish



## Recreational Bass Fishing Only - two case studies closer to home

### Isle of Man bass fishing

In recognising the tourism potential for developing bass angling on the island, on the 1st December 2016, the Manx Department of Environment, Food and Agriculture made the following amendment to section 12 of the Fisheries Act 2012:

Within the Isle of Man's territorial waters (12nm) bass may be fished for and/or taken by recreational rod and line anglers only.

#### Anglers must abide by the following conditions:

**General restrictions:** Only one bass may be retained in any period of 24 hours. An angler may continue to fish after keeping a bass, but must not keep another one for the following 24 hours.

**Size / slot limits:** A bass may be retained only if it is at least 50cm and no more than 60cm in length, as measured from the tip of the snout to the end of the tail.

**Taking and killing of bass:** Retained bass must be removed in a whole state (i.e. not gutted or otherwise mutilated) from the foreshore, jetty or recreational fishing vessel from which it was caught.

**Handling bass:** Bass must be handled carefully to ensure a high survival rate of released fish. Anglers are advised to carry forceps or long-nosed pliers to assist removal of hooks, and to support fish in the water until they are able to swim off.



Releasing a bass back into its environment, known as 'Catch and Release' (C&R,) is one of the most satisfying elements of angling for bass. So too is the feeling of being able to take home a fresh, healthy meal for family or friends. So, whether anglers practice C&R or Catch and Take (C&T), they can cause **minimal** impact on bass stocks and contribute **maximum** economic impact for our UK coastal businesses and communities - A win-win if ever there was one.

### **Southern Ireland bass fishing** from: <https://fishinginireland.info/sea/east/bass/>

The Bass (*Dicentrarchus labrax*) is a true sport fish highly prized by all sea anglers. A muscular bar of silver, exempt in Irish inshore waters from commercial exploitation since 1990 and protected by specific bye laws, Bass can be targeted all the way along the east and south east coasts from Co. Louth to Co. Wexford. Estuaries, mudflats, steep to shingle beaches, sandy surf beaches, rocky shores, and headlands, tide races that channel bait fish, are all areas where bass can be found. The last twenty years have seen a vast improvement in bass numbers, and this is particularly apparent within the eastern region.

A supreme predator and opportunist feeder, bass have a varied diet, anything from worms and crustaceans, to fish and shellfish are all fair game. This in turn is what makes fishing for bass so interesting. Anglers can surf cast, lure fish with plugs and spoons, fly fish, and even live bait. The season kicks off in early March, particularly on the south coast, and extends through until usually November. A close season is observed between the 15th of May and the 15th of June as this is a key spawning time for bass. Anglers are also limited to two bass within any 24 hour period, with a size limit of forty five centimetres. Catch and release is encouraged.

According to the study *The Economic Contribution of Bass and Sea Angling in Ireland (2015)*, recreational fisheries of sea bass in IE could be estimated as follows:

- Total expenditure by Irish anglers in Ireland on sea bass fishing: EUR 43 million.
- Contribution of Irish Bass Recreational Fishery to Irish Economy (Non-Irish Anglers): EUR 9 million.
- Total Contribution of Irish Bass Recreational Fishery to Irish Economy: EUR 52 million, which is almost 31% of direct spending on all sea angling activities in Ireland (EUR 169 million).

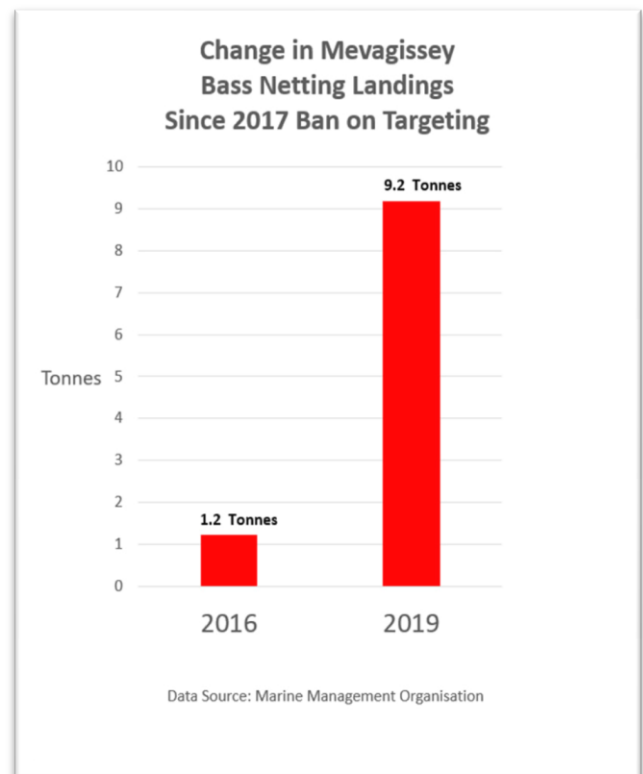
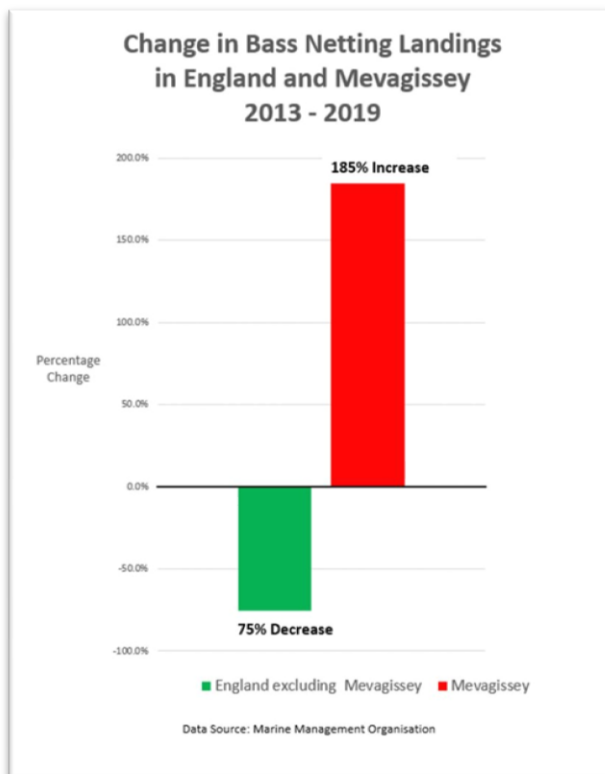


*Bass anglers travel from far and wide to experience the bass 'craic' available in Southern Ireland*

## Effective Enforcement ... or lack thereof

There is strong evidence, if you know where to look, that the existing bass regulations are being flouted by a minority of fishermen and loopholes are being exploited to breaking point. If one delves into the MMO'S landing data for bass, for the Cornish port of Mevagissey, it becomes apparent that regulations introduced to protect bass, by reducing the numbers caught in nets, are being adhered to by the majority of UK fishers. Yet Between 2013 and 2019, landings of net-caught bass into Mevagissey almost tripled from 3.2 tonnes to 9.2 tonnes. That is a 185% increase for Mevagissey, while landings of net-caught bass into the rest of England decreased by 75%.

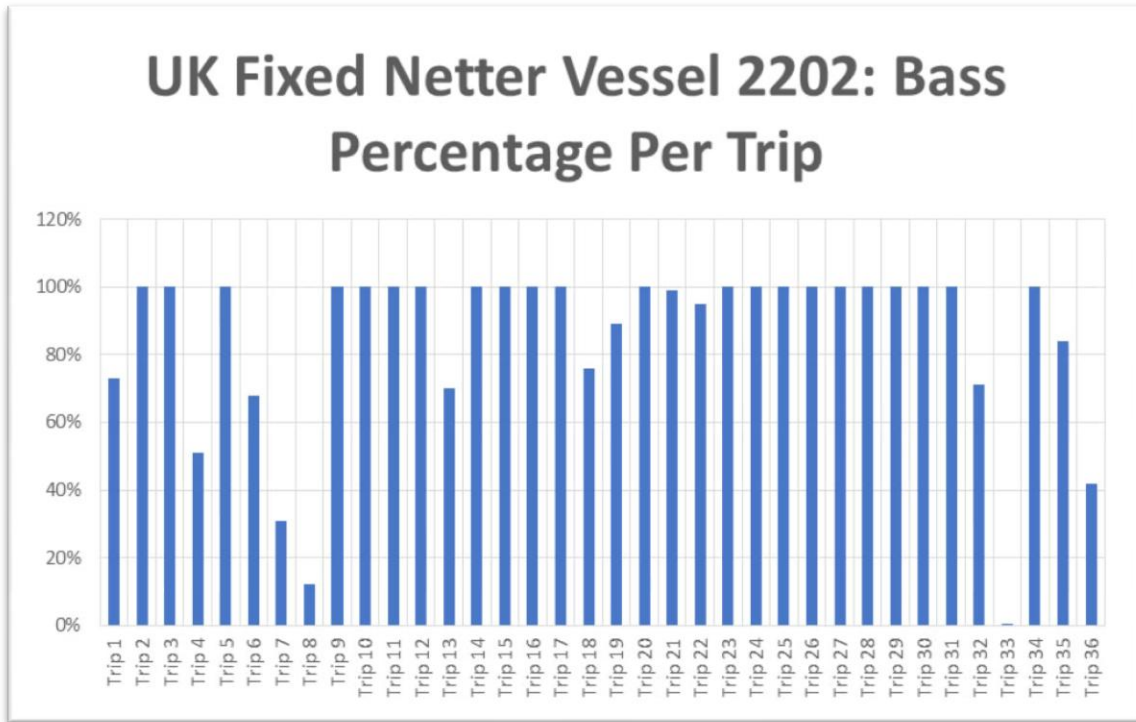
But it gets worse: in 2016, when it was still possible for netters to legally target bass, net-caught bass landings in Mevagissey were 1.2 tonnes. Since 2017 it has been illegal for netters to target bass, but that has apparently been no constraint to netters in Mevagissey, since their bass landings shot up to 9.2 tonnes in 2019, a staggering seven-fold increase since 2016. And since 2016, Mevagissey has leapt up the table of ports landing net-caught bass: **from 34th place in 2016 to 1st place in 2018 and 2019!**



To date, despite bringing the data to the attention of enforcement agencies and a high profile publicity campaign to highlight these clear breaches of the regulations, no action appears to have been taken concerning these infringements.

Since 2017, it has been illegal for fixed netters to target bass – they are only allowed to land bass if it is “unavoidable by-catch”. Yet anonymised vessel landing data provided by the MMO, under a Freedom of Information request, suggests that some Cornish vessels ARE targeting bass. For example, in the case of Cornish vessel with anonymised vessel ID 2202, bass made up 85% of its total landings from 36 trips in 2019, and 22 of those trips contained 100% bass!

The evidence is there in the landing data, for enforcement agencies to take action, but they do not.



*And yet Cornwall IFCA tells us it is difficult to prove that netters are targeting bass!*

There is also evidence that some netting vessels exceeded their annual bass bycatch allowance (1.2 Tonnes in 2018 and 1.4 tonnes in 2019), seemingly without repercussions!

And finally, as if Cornish fixed netters illegally targeting bass and exceeding annual by-catch allowances were not enough, the MMO data shows vessels landing bass during the February / March commercial fishing closed period. No wonder anglers are annoyed and frustrated at the lack of enforcement of the bass regulations, when they are subject to a two fish bag limit and longer closed seasons than commercial fishers. Isn't it about time the 'unavoidable' bass by-catch loophole was closed once and for all by attaching a realistic limit of say 10% of the total catch landed?

*Some landings into Mevagissey have comprised of 100% bass*



### Further Enforcement Issues Related to the Bass Fishery

One might be forgiven for concluding that the rule breaking is limited to the occasional breach of the landing regulations, or the activities of one or two rogue fishermen, but again, closer inspection reveals that the bass landing regulations are regularly being flouted, or even ignored and so, it would appear, is the enforcement of those very regulations designed to protect dwindling stocks. If we can identify these transgressions why can't those charged with enforcement and take action?

Year: 2019

Vessel ID	Trip ID	Catch Landed in Kgs	Bass as % of catch
550	44478	931.9	100%
"	56276	178.2	96%
"	44970	194.05	72%
"	27705	562.7	97%
Total /average		1,866.85	91.25%

There is really no way these catches can be regarded as accidental by-catch, rather than targeted fishing. Irrespective of whether such trips are considered as 'Targeted' fishing of bass or 'Accidental/unintentional', the annual limit in 2019 was 1.4 tonnes and this vessel has landed well in excess of the permitted limit. In addition to the four trips shown above, this vessel made six further landings of bass for a total annual weight of over 2 tonnes.

Year: 2020. Vessel ID 2156, Trip ID 37818  
 MMO landing data showing a trawl landing of 420 kilos (all species) of which bass is 169.8 kilos. That represents 40.4% when the permitted percentage is only 5%. What was the MMO's action for this apparent excess landing? The same trip also shows an additional landing of bass by hook & line of 113.3 kilos. It would be highly unusual for a trawler to fish H&L and even more unusual to do so on the same trip? Was this vessel authorised to land bass with H&L? If not, did the MMO investigate and / or take any action?

During 2020, trawlers were restricted to 520 kilos bycatch of bass over two consecutive months. There were numerous instances of trawlers exceeding this catch limit. Here are just some examples.

Vessel ID	Months of Excess Landings	Kilos landed in 2 months	Excess landings in Kilos
1345	Oct & Nov	1,746	1,226
1345	Nov & Dec	1,094	574
282	Sept & Oct	1,466	946
282	Oct & Nov	944	424
1309	May & June	662	142
Total			3,312

During 2020, more than a dozen vessels are shown as landing in excess of 1.4 tonnes of bass from nets with some vessels landing more than twice the annual permitted weight. Were any of these vessels the subject of MMO investigation and if so, what were the outcomes?

## Whose Fish Are They Anyway?

If, for this exercise, we set aside the fact that fisheries are a publicly owned resource, the bass that are caught in the largest quantities, during the months of October to December, are predominantly pre-spawning, migrating fish. This is confirmed by the results of the C-Bass Project. This important Defra-funded project ran from 2013 – 2020 which aimed to gather knowledge of regional and seasonal movements and distribution of bass throughout their life stages. The outputs from several other research projects also contributed to the final report. Throughout the duration of C-Bass, Cefas collaborated with French colleagues at Ifremer, who released over 1400 Data Storage Tag-tagged bass during a four-year research programme (BARGIP, 2013-2017).

**Adult bass migrate to pre-spawning areas in the western English Channel between October and December as females seek water warmer than 9°C.**

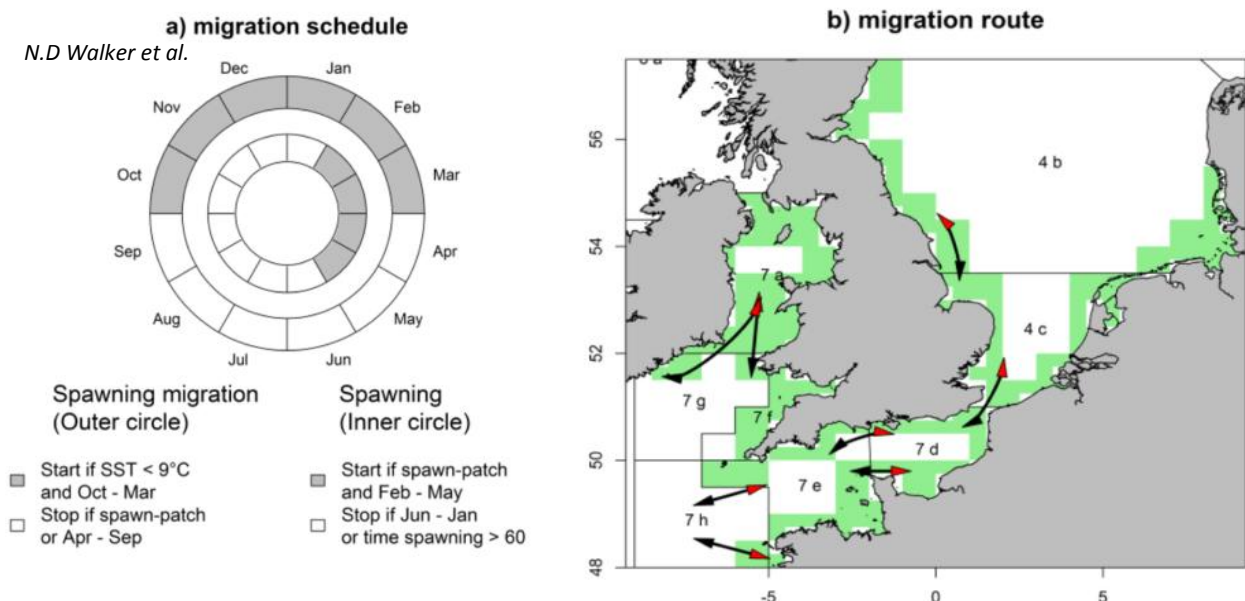
**Spawning then starts offshore in the Celtic Sea and western English Channel from February and spreads east as the water attains 9°C.**

**Southwest and west coasts had high levels of immigration from other regions, in contrast to the southeast (southern North Sea), which appears to be a net exporter of bass**

*Population studies in support of the conservation of the European sea bass (C-Bass) and below*

Therefore, in all likelihood, these large seasonal catches of bass not only breach the prevailing landing regulations, but are intercepting adult bass on their migrations to their historic spawning grounds in the western English Channel and have originated from all coastal regions of the English Channel to the east of Cornwall. Not only does this seasonal 'ambush' have a detrimental effect on the spawning stock biomass, as many of these fish will be first-time spawners, but they will now never return to their summer feeding locations the following year, thus depriving those who are dependent upon these fish for food and recreation and the related income generation of 'their' bass.

Graphics below shows a schedule for spawning migrations. Outer circle: migration to (pre-spawning areas) is triggered by Sea Surface Temperature (SST) and can take place between October and March. Inner circle: spawning takes place within offshore spawning patches appearing February–May.



### Playing the Discards Card

We hear a lot about the emotive subject of bycatch from the commercial sector – how they have to throw back tonnes of perfectly good fish. Every year, just before the EU Fishing Opportunities meetings, we watch footage on the television of fish, especially bass, being discarded. It is a thinly disguised attempt to influence fishery managers through public pressure. It only seems to happen prior to the Fishing Opportunities meetings. The whole sad and sorry episodes reflects adversely on all those who were involved. It's nothing short of an attempt to mislead the public.

Discards are fish which are thrown away when a quota - an allowance or cap - has been exceeded. The cap is there to protect the fish, to prevent a free-for-all and the resultant overfishing that would occur without one. It could be termed, "a necessary evil". The level at which the cap is set is decided by scientists, who have no axe to grind and it is based upon scientific evidence. They are only interested in the stock and making sure that the fishing of that stock is sustainable, so it will be available for future generations.

No one wishes to see perfectly good fish discarded. The problem is that the only alternative to a quota or cap is to let fishermen land what they catch. That is exactly what has happened to bass over the years and is why the stock is in such an abject state now. Bass had no quota and thus no protection in the past. Because bass are a shoaling fish they are relatively easy to target and without the protection of a quota, fishermen could catch and land what they wanted - as long as they were of minimum size. The stock became decimated and that is why, in 2015, emergency measures had to be introduced to protect them. Taking that into consideration it is clear that discarding is actually a mechanism to reduce mortality.

Quotas and discards are in place to protect not just fish but also commercial fishermen's livelihoods – they are a protective measure to decrease mortality. If the fishermen can't sell their catch then there is no point in fishing for them so mortality decreases. Discarding was brought about as a result of years of commercial overfishing. If there is to be no discarding of bass and commercial and recreational fishermen are allowed to land every bass they catch then overfishing will occur. Here's an example:

A trawlerman goes out and catches 700 kilos of bass. At the moment he has to discard some of these and yes, they will be dead. The alternative scenario is that he is allowed to land these bass and if that is the case then he will almost certainly, and understandably, be out there in the same area again tomorrow trying to catch even more bass. Not only that but other boats will hear of his landings and will join him on the bass bonanza.

As a result of the increased fishing effort the 700 kilos of today could easily become 7 tonnes tomorrow. While the fishermen are catching they will keep going and the shoal could be wiped out completely. This would be happening in not just one area of our seas but in other areas all around our coasts, so the cumulative effect would be catastrophic. There would be a significant amount being removed from an already depleted biomass and the stock would slip further and further below Blim, (the point at which the stocks ability to recover is compromised), and into oblivion. Does anyone REALLY believe that is the way we want to manage a fishery? This is exactly the lack of foresight that got bass, along with other species, into trouble in the first place – a complete absence of protection resulting in unregulated landings. It became a free-for-all with no restrictions - result? - Overfishing.

Surely it is better to allocate protective measures to bass now, so the stock can regenerate, and the fishery can have a long-term future? That will benefit all stakeholders and somewhat ironically, especially the commercial fishermen. Wouldn't it make sense, when a fisherman has a genuine unavoidable by-catch of bass, he notifies other skippers over the radio, so they can avoid the area



and keep bass mortality to a minimum. It is in their best interests to do so. That has to a better option than catching them just to film them being discarded.

When we are constantly taking from a resource at a faster rate than it can regenerate naturally, fish stocks are going to be in trouble. That isn't difficult to understand but it is something that many commercial fishermen appear unable to grasp. Perhaps they simply don't want to, or think that if they don't catch them then someone else will. The fishery management of bass needs to be about nurturing what little is left and allowing it time to regenerate, rather than racing to wipe it out completely in the shortest time possible. As renowned marine biologist Daniel Pauly has opined:

***Most people not connected with fisheries feel that discarding perfectly edible fish in our age of widespread hunger and scarcity is unethical, and they are right, even if it is only 7-8 million metric tons that are discarded. Moreover, some fishing countries, notably Norway, banned discarding altogether, and the European Union is poised to do so. If the European Union succeeds in banning discarding, it will force its fisheries to become more selective and generate "cleaner" catches, with fewer non-target species.***

<http://usa.oceana.org/blog/ask-dr-pauly-what-are-bycatch-and-discards>

***Oh, I almost forgot. There are an awful lot of marine mammals, seabirds, and sea turtles many belonging to threatened species—among the bycatch and discards of the world's fisheries. But as I hope to have shown above, discards are not limited to cute or threatened animals. Discarding is crazy and immoral even when we are looking only at fish***

The core issue is how to avoid discarding whilst simultaneously NOT incentivising the targeting of species. It is easy to simply say when fish are genuinely caught accidentally – and it does happen -- they should be retained and landed. However, that immediately results in an incentive to "accidentally" catch more of the fish fishermen are not supposed to target.

Much of (maybe most of) the bass caught as trawl by-catch are taken by trawlers after cuttle. During 2020 the price of cuttle was £2,195 per tonne versus bass £8,513 per tonne. When the by-catch species is worth four times the target species, an "accidental" hit of by-catch is VERY welcome.

### **The Icelandic Model**

The Icelandic Fisheries Management system prohibit discards (solves the unethical issue) BUT removes the incentive to "accidentally" catch by ONLY paying the vessel a handling charge of 10% whilst the fish that would have been discarded are sold into the food chain with the 90% of value being retained by Government for fisheries research (in the UK currently paid from the public purse).

There are certain incentives for compliance incorporated into the system. For example, the master of a vessel can decide that a certain amount of all landed catch will not be deducted from the vessel catch quota, on the condition that this catch is sold at an auction market.

***The proceeds from these sales are directed to a ring-fenced fund that is used to fund marine research. The crews of the fishing vessels get paid a minimum, fixed handling fee for bringing the bycatch ashore. This rule encourages vessels to bring all catches to port. As regards cod, haddock and saithe, only half of such catches count against the quota of a vessel, to a maximum of 10% of the catch on each fishing trip. There is scope for a similar system to be introduced within UK waters ... but is there the political will to do so?***

### Our Viewpoint

Is perhaps best summed up by a response to the Lived Experience phase of the BFMP stakeholder engagement process. David Curtis, a leading campaigner for sea angling and bass anglers wrote:

To say the bass fishery is a mess is an understatement. Neither the UK nor the EU has any strategy for the bass fishery, except to follow the MSY approach - which is a totally inappropriate goal for the bass fishery, where sea anglers are the major stakeholder and where bass is a slow growing and slow maturing fish with patchy year-classes. The stock has crashed and is recovering, but painfully slowly because of increasing fishing pressure.



*David Curtis meets with George Eustice, Brussels, Dec. 2019*

In recent years The EU and Defra have been instrumental in relaxing restrictions on commercial fishers and allowing illegal targeting by netters, with no thought at all for managing the stock to deliver the best value to all society.

Defra as a whole seems to see its role as delivering for the commercial fishing industry and the small number of Defra staff who are even aware that sea angling is the major stakeholder in English inshore fisheries mostly pay sea angling only lip service – a nuisance to be tolerated, but not taken seriously unlike commercial fishing. UK sea anglers have been discriminated against in Fishing Opportunity decisions.

At Defra's request, BASS wrote a comprehensive Bass Management Plan in 2004. Had Defra read it and implemented it, the bass fishery would not be in the mess it is now. Given Defra's inherent fear of upsetting the commercial fishing industry, I am concerned that Defra will duck any issues that could result in decisions that may have a short-term negative impact on commercial fishing, but would maximise the benefit to the UK as a whole.

Even if Defra signs off on a decent Bass FMP, I am concerned that it will fail to deliver, since the BASS FMP seems unlikely to result in any laws or commitments against which the delivery partners (IFCAs, MMO, EA) can be held to account and indeed there are no mechanisms for Defra to hold these bodies to account.

The current management of the bass fishery is broken - pursuing the wrong goal and paying too much attention to commercial fishing and not enough to sea angling. Fixing the bass fishery is not rocket science and we have lots of precedents for World Class fisheries from other countries such as the US, Australia and New Zealand.

Defra has talked a lot about creating "World Class" fisheries, but the key barriers to creating these are our Fisheries Minister and Defra itself. Do they have the vision, will and political courage to push through the real and meaningful reforms needed to deliver a World Class bass fishery? There is currently a lot of talk about the need to restore trust in the government and delivering on promises.

**Actions speak louder than words.**

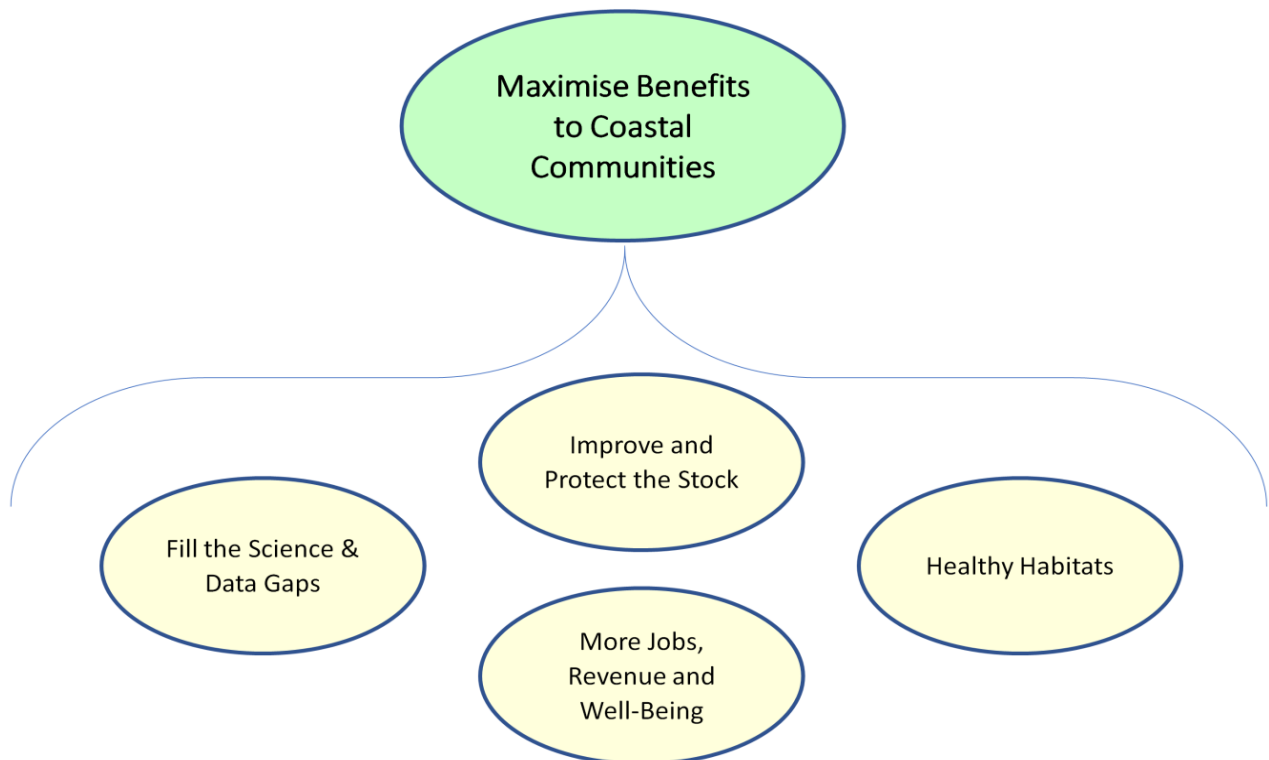
## Part II



# Bass FMP Goal, Objectives and Challenges



## Over-Arching Goal and Objectives



### **Goal: To Maximise Benefits to Coastal Communities from a Restored Bass Stock**

The bass fishery has been being badly mismanaged and is delivering only a fraction of the possible social and economic benefits. The bass fishery is a societal asset and the government should start managing it to generate the Maximum Sustainable Benefits (“**MSB**”) for coastal communities.

The current sole goal being pursued by fishery managers is Maximum Sustainable Yield (i.e. maximising the tonnage of bass that can be killed and sold by commercial fishers). But MSY is solely a commercial fishing objective – it makes no sense at all for the bass fishery where sea anglers are far and away the biggest stakeholder (by both by economic value and the number of participants) and generate the greatest social and economic benefits by far.

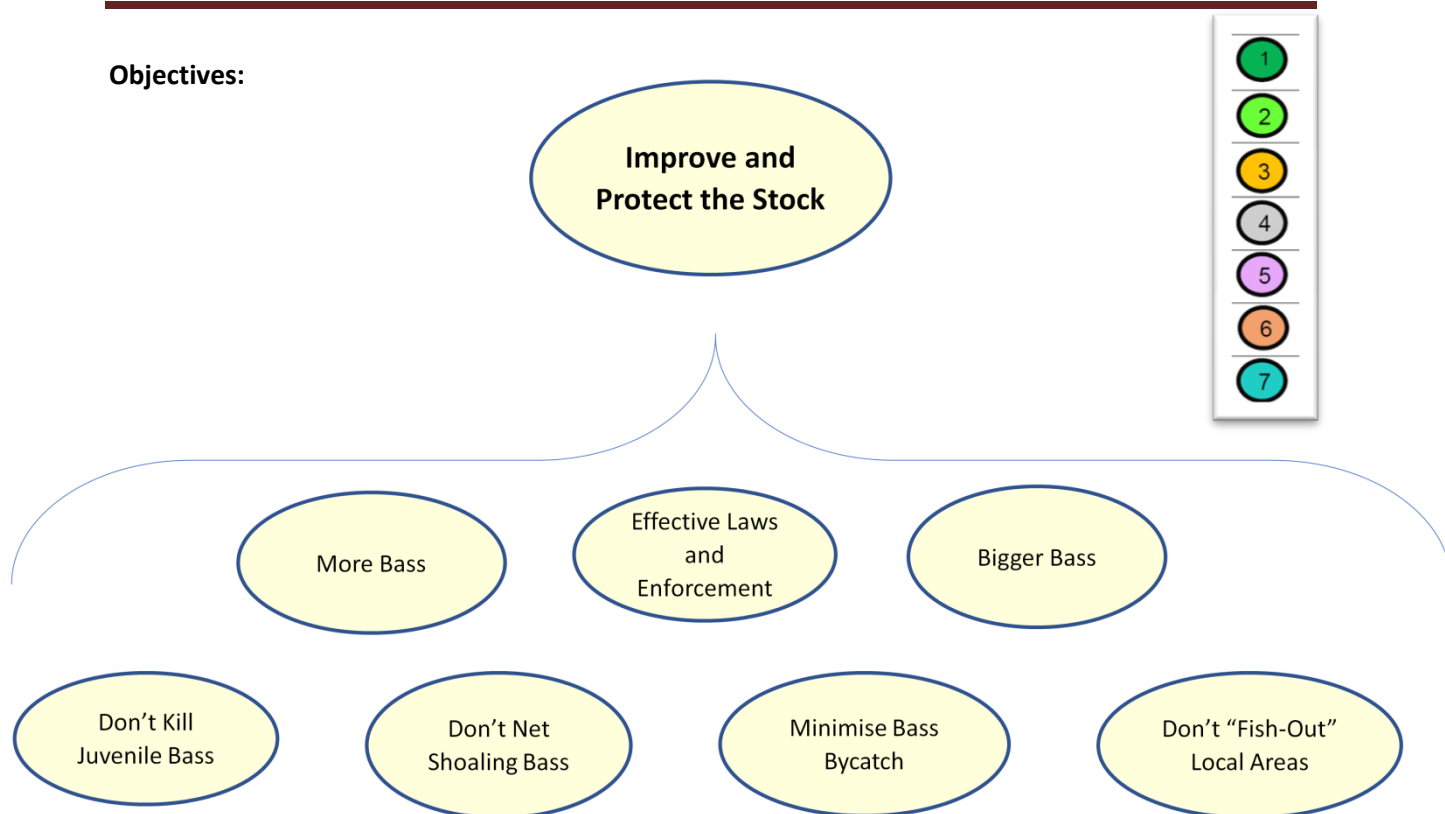
Why are fisheries managers managing the bass fishery for the wrong goal?

Sea anglers have been discriminated against in the bass fishery, suppressing the value of bass angling: a longer closed period than commercial fishers; and an increase in the bag limit was rejected, while commercial fishers have been given increased catch limits in the last two years.

We hope the Bass FMP will radically transform the bass fishery for the better, but bass fishery management to date strongly suggests Defra sees its role not as maximising the benefit to society from our fisheries, but as protecting the commercial fishing industry. Will Defra simply kick into the long grass any Bass FMP proposals if commercial fishers object?

We are mindful that Defra asked **BASS** to prepare a Bass Management Plan in 2004 and this is sitting in a filing cabinet somewhere in Whitehall unread, unused and gathering dust.

Objectives:



### Improve and Protect the Stock

What are the Challenges?

Despite repeated warnings from scientists and concerned anglers, fishery managers allowed the bass stock to crash and it is recovering very slowly, due primarily to fishing pressure. **Cefas estimates that using current assumptions, it will take 15 years to recover the bass stock to a safe level.** Repeated increases in commercial fishing pressure are constraining the value of the bass fishery.

Commercial fishing pressure has removed and continues to remove most of the big bass. These fish are massively more reproductive than younger fish and would make the bass fishery more resilient. They are also highly sought after by sea anglers, mostly on a catch and release basis.

The depressed level of the stock makes it harder to catch bass – a lower Catch Per Unit of Effort. This reduces the value of the bass fishery to sea anglers and commercial fishers alike.

Some of the laws governing the bass fishery have brought the UK government into disrepute. It is illegal for bass to be targeted by fixed netters, yet the government has deliberately ensured that fixed netters can target bass without fear of prosecution by failing to introduce rules to stop obviously targeted bass being landed as “by-catch”. The government feels that fixed netters should be able to target bass, despite it being illegal.

The UK government changed the law to remove the word “unavoidable” from the fixed netters “unavoidable by-catch” rule, so that fixed netters no longer have to try to avoid catching bass – so much for the government’s Fisheries Act objective to reduce by-catch.

The UK government has removed the “track record” requirement for trawlers and seiners, allowing new vessels to enter the bass fishery at a time when fishing pressure needs to be tightly restricted.

The “dual gear restriction” makes it illegal for a fishing vessel to retain sea bass on board on a trip if it is carrying both fixed nets and hook and line gear, but this is not being enforced. We believe many fixed netters are landing bass as hook and line caught bass, to take advantage of the much higher catch limit for hook and liners.

There are regular reports of bass being transhipped from netting vessels to Hook and Line vessels, so that the bass can be landed as hook and line caught bass, to take advantage of the much higher catch limit for hook and liners.

There are reports that bass catches are being recorded for vessels that are not actually leaving port.

Unless the government takes steps to prevent it, the bass catch limits will become property rights for commercial fishers in perpetuity, constraining the government’s flexibility in allocating bass fishing opportunities. This would be a repeat of the disastrous experience of the quota system, where the government now finds it extremely difficult to reallocate quota to under ten metre vessels. Already, a bass authorisation increases the resale value of a vessel, reflecting the view of commercial fishers that a bass authorisation confers bass fishing rights into the future.

Pair trawling of offshore bass aggregations played a major part in the bass stock crash. Pair trawlers are now banned from landing bass but could potentially re-enter the fishery if sufficient political pressure was applied. This would be a disaster for the bass fishery.

As a result of pressure from a handful of netters in NEIFCA district, the government has changed the law to allow shore netters to land bass. The catch data since that fishery reopened indicates that bass is overwhelmingly the main species caught, and is not a by-catch species. Yet it is illegal for shore netters to target bass.

Catches by some fixed netting vessels in some IFCA districts are extremely high, suggesting they are targeting shoals of bass either as they migrate to and from spawning areas or as they aggregate to spawn. This is damaging the bass fishery for all the other stakeholders. Commercial hand liners report that fixed netters are illegally targeting bass in known aggregation areas, with the presence of nets physically preventing hand liners from fishing at those locations.

Some commercial netters are catching juvenile bass by using nets with too small a mesh size. There are regular reports that these fish are illegally sold rather than discarded.

The MCRS is set at 42cm, the size at which only half of bass are mature and able to reproduce. Current management and lax enforcement allows juvenile bass to be killed and sold, even though the stock is still recovering from a crash.

As well as the season for retaining bass being discriminatory between sea anglers (9 months) and commercial fishers (10 months), the closed season is not aligned with the spawning season.

There are many uncertainties in the bass assessment. Applying an MSY approach to bass seems to be insufficiently precautionary, since bass is a slow growing, slow maturing fish with irregular recruitment.

Some commercial fixed netters are “fishing-out” bass in some areas. Bass return each year to the same coastal locations (“site fidelity”). If these fish are killed by heavy fixed netting fishing pressure,

it can take many, many years for the bass populations in that area to recover, damaging the fishing for all other stakeholders in that area.

Some fixed netters are setting nets extremely close to the shore, stopping sea anglers being able to fish at their favourite locations.

The government has done nothing to try to reduce bass by-catch. It has regularly supported increases in by-catch limits, to allow more bass by-catch to be landed, but it has failed to do any work on understanding why the by-catch is happening or how it can be reduced. This is despite the commitment in the Fisheries Act to reduce unwanted and wasteful by-catch.



As Fishing Opportunities approach each year, bottom trawlers in the South West start posting videos of bass catches, complaining they have to discard them and asking for bigger by-catch limits. Despite pressure from sea anglers, the government shows no interest in investigating the causes of this by-catch or trying to reduce it.

Instead it adopts the head-in-the-sand approach of repeatedly agreeing increased commercial catch limits, while steadfastly refusing to allocate any 'spare' stock to the recreational sector, where the highest value would be derived from the additional allocation.

Enforcement of the law has been very poor. Until recently under 10 metre commercial fishers were not required to report their catch, making the catch limits totally unenforceable. It is hoped the new U10 Catch App will change this, but it is still early days and there are many reports of bass being sold by commercial fishers but not reported.

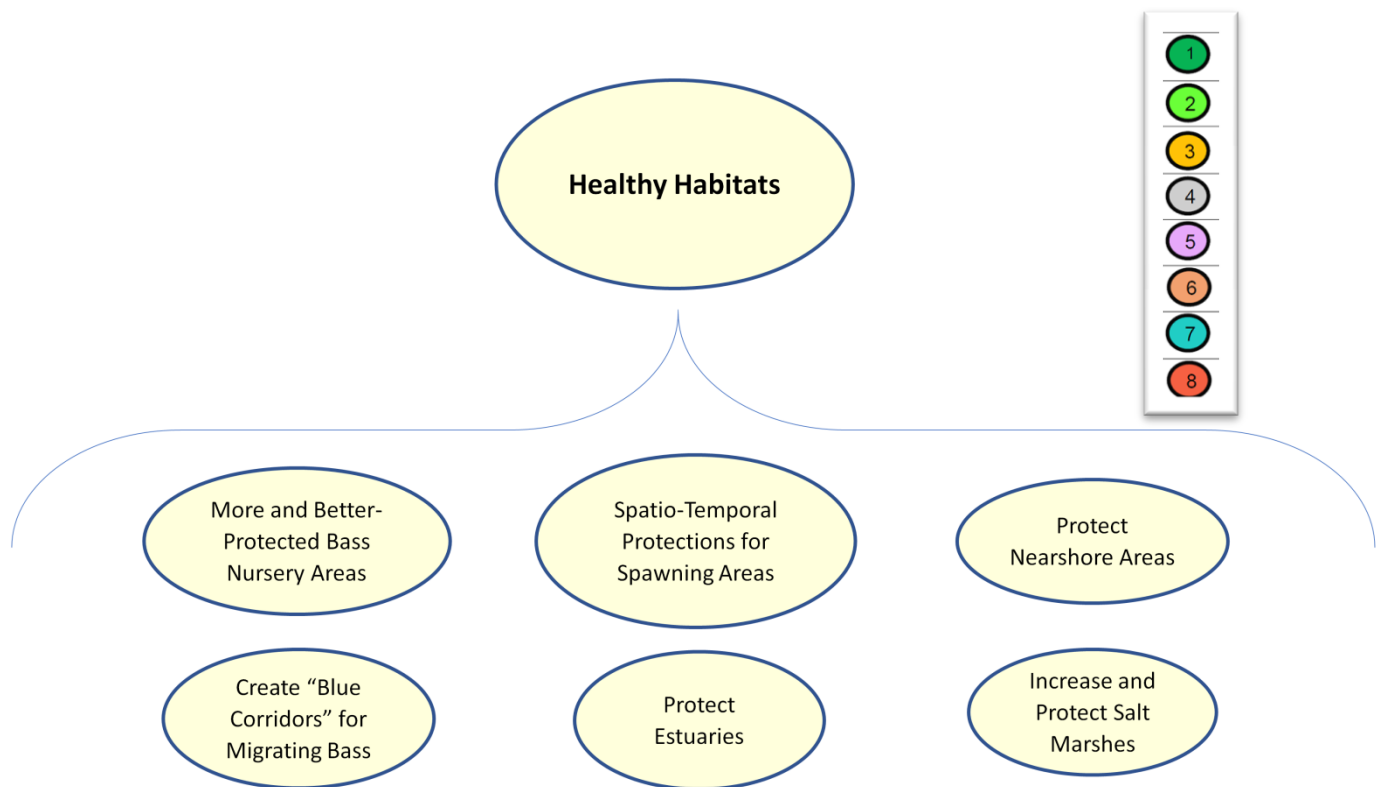
The U10 Catch App was watered-down so that commercial fishers do not have to complete their Catch App report before they unload their catch. This was done to enable commercial fishers to weigh their catch on the quayside. Allowing commercial fishers to unload their catch before reporting their catch makes it much more difficult to check that all the catch is recorded.

Small unpowered vessels do not need a licence to fish commercially for bass and are not subject to the rules that apply to powered commercial fishing vessels – for example catch limits, closed periods and track record requirement. These catches are not recorded.

Industrial scale “fly-seining” in the English Channel has grown very quickly. This type of fishing is totally unsuitable for coastal fisheries, since it can remove large quantities of fish over a wide area. This is unsustainable and damaging for all other stakeholders in the fishery.

Splitting bass enforcement measures between the MMO and IFCA has been a disaster. CIFCA was not aware of the level of commercial bass fishing in its district and when prompted find out was unable to access the information from the MMO.

Sea anglers widely consider IFCA to be totally ineffective in enforcing the bass regulations. Yet without proper enforcement, how can the bass fishery recover?



## Healthy Habitats

Cefas has advised that more sites should be designated as bass nursery areas. The government took a long time to release the Cefas report and as yet shows no signs of acting on it.

Fixed netting is allowed in many bass nursery areas, often carried out under the guise of targeting mullet, but with bass being killed, often juveniles.

Salt marsh is an important habitat for juvenile bass. But salt marsh has been lost, for example to housing development. Salt marshes need to be restored and protected.

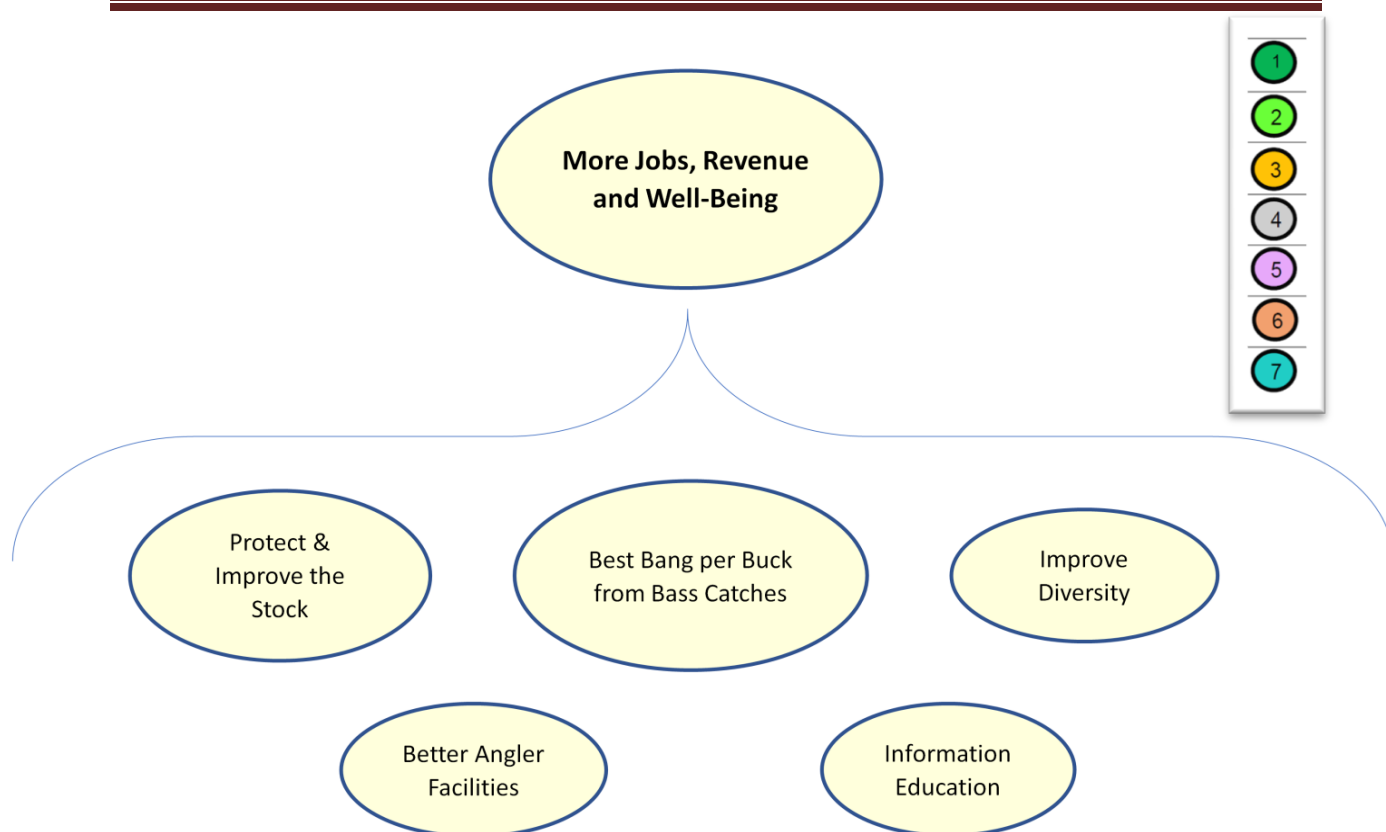
Estuaries are essential habitat for bass, especially juvenile bass. Unfortunately some estuaries are not protected from fixed netting.

As discussed above, bass migrate along the coastline to and from offshore spawning sites. At these times they are highly vulnerable to inshore fixed netting.

Near-shore areas are extremely sensitive, yet commercial fixed netters are often allowed to set nets very close to the shore and trawlers allowed to operate in these areas, destroying essential sea grass habitat.

Seagrasses (often found in BNAs) don't receive much attention, but they are one of the most productive ecosystem types on the Earth. They also have an incredible ability that helps fight climate change – a huge capacity for carbon absorption. Seagrasses act as a dense sediment trap, capturing carbon and storing it, eventually depositing it onto the seafloor (*ClientEarth Communications July 22*)





### More Jobs, Revenue and Well-Being

A key element to this is improving and protecting the stock, as discussed above. Valuable bass angling activity is constrained by the low availability of bass and in particular large bass.

However, currently fishery managers allocate bass fishing opportunities with little or no understanding of the benefits accruing from each type of fishing or any thought as to how to maximise the benefits available to society (and in particular coastal communities) from the fishery.

Diversity in the bass fishery is low and urgently needs to be addressed by government.

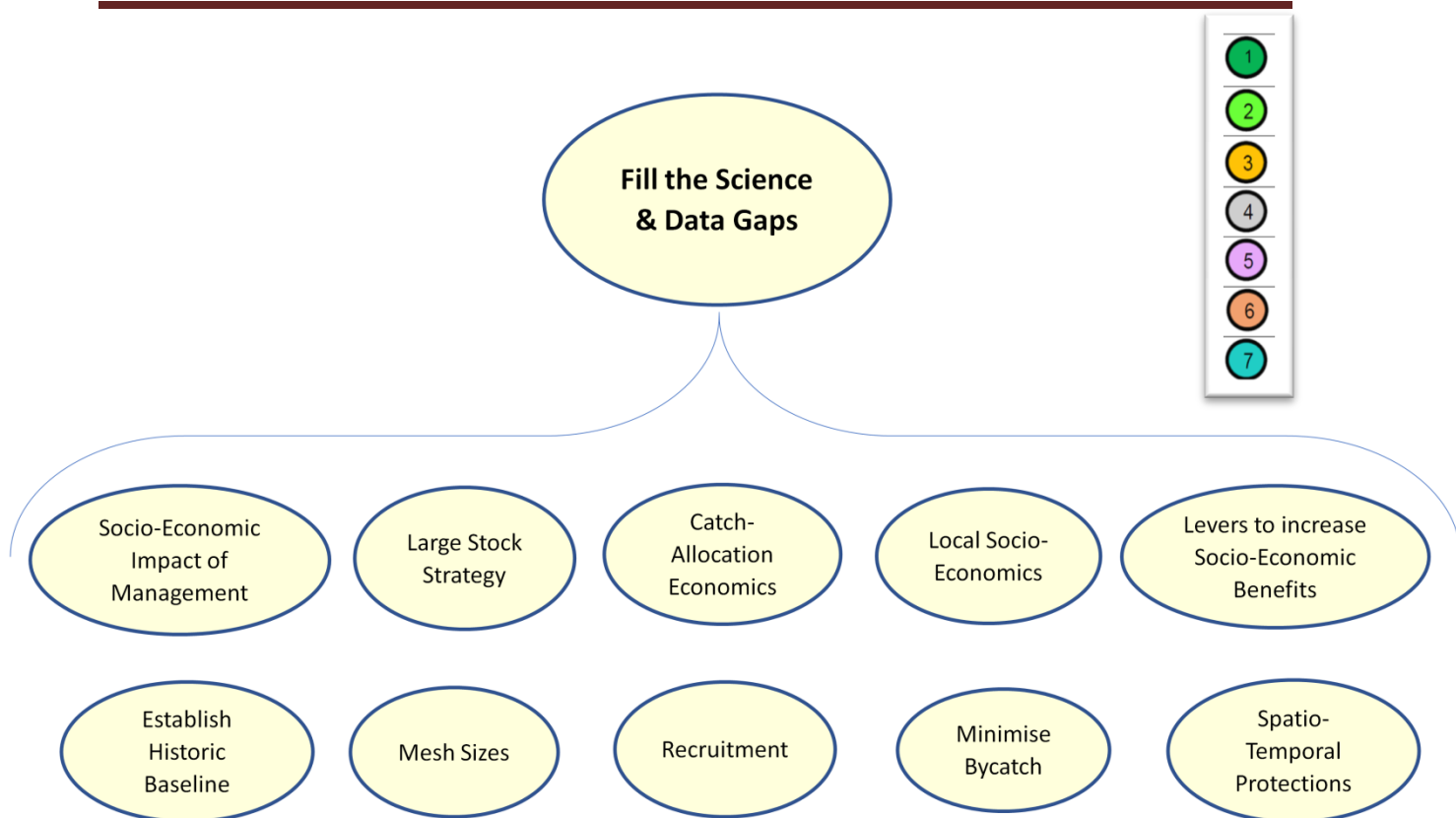
Most people do not know about the bass fishery. The promotion and development of the bass fishery would increase participation and associated socio-economic benefits. Sea angling enables participants to access the numerous benefits associated with a 'blue mind and blue health through spending time by the ocean, with 70% of anglers saying it helps them deal with stress, for example.

Angling has been prescribed by the NHS to treat anxiety and depression. Greater Manchester Mental Health Trust has become the first to pilot the scheme after partnering with fishing charity Tackling Minds. (*The Telegraph* 21/04/2021)

There are few public facilities for bass anglers, such as boat ramps, fish cleaning stations, man-made reefs, fishing piers and information boards etc. unlike in Australia, New Zealand, Norway and the US.

The lack of quality bass fishing and infrastructure is holding back the latent potential for growth.

**'If You Build It, They Will Come.'**



### Fill the Science & Data Gaps

There is very little science on how catch allocations to different stakeholder groups impact the overall socio-economic benefits to society. This leads to sub-optimal catch allocation decisions.

Fishery managers have little or no understanding of the levers to pull to increase the socio-economic benefits from the bass fishery. In particular, and alarmingly, there is hardly any socio-economic data at the scale of coastal communities.

Fisheries science focuses on delivering information to support management using the MSY approach. However, for many reasons, the MSY approach is not suitable for the bass fishery, including - because it is predominantly a recreational fishery. Fisheries science need to develop data to enable fisheries managers to extract the Maximum Sustainable Benefit from the bass fishery.

Bass is a migratory species – science is needed to support potential spatio-temporal management measures to protect migrating bass and shoaling bass.

Fisheries managers need to know who is fishing for what, when, where and how. This is essential to deliver on the Fisheries Act objective of reducing by-catch.

Some commercial fixed netters are catching juvenile bass. Work is needed on netting in the real world, to understand what fixed netting rules would reduce catches of juvenile bass (for example mesh sizes, hang ratios etc).

Scientists need to establish a historic baseline for the bass fishery. Older fishers report higher bass catches and higher sizes of bass caught. Without a historic baseline, current day fishers are prone to accept the current impoverished state of affairs as being normal.

Annex (i)

**The Fisheries Act 2020 sets out a number of Fisheries objectives**

(1)The fisheries objectives are—

- (a)the sustainability objective,
- (b)the precautionary objective,
- (c)the ecosystem objective,
- (d)the scientific evidence objective,
- (e)the by-catch objective,
- (f)the equal access objective,
- (g)the national benefit objective, and
- (h)the climate change objective.

Objective	Number
Sustainability objective	1
Precautionary objective	2
Ecosystem objective	3
Scientific evidence objective	4
Bycatch objective	5
Equal access objective	6
National benefit objective	7
Climate change objective	8

(1)The “sustainability objective” is that—

- (a)fish and aquaculture activities are—
  - (i)environmentally sustainable in the long term, and
  - (ii)managed so as to achieve economic, social and employment benefits and contribute to the availability of food supplies, and
- (b)the fishing capacity of fleets is such that fleets are economically viable but do not overexploit marine stocks.

(2)The “precautionary objective” is that—

- (a)the precautionary approach to fisheries management is applied, and
- (b)exploitation of marine stocks restores and maintains populations of harvested species above biomass levels capable of producing maximum sustainable yield.

(3)The “ecosystem objective” is that—

- (a)fish and aquaculture activities are managed using an ecosystem-based approach so as to ensure that their negative impacts on marine ecosystems are minimised and, where possible, reversed, and
- (b)incidental catches of sensitive species are minimised and, where possible, eliminated.

(4)The “scientific evidence objective” is that—

- (a)scientific data relevant to the management of fish and aquaculture activities is collected,
- (b)where appropriate, the fisheries policy authorities work together on the collection of, and share, such scientific data, and
- (c)the management of fish and aquaculture activities is based on the best available scientific advice.

(5)The “by-catch objective” is that—

- (a)the catching of fish that are below minimum conservation reference size, and other by-catch, is avoided or reduced,
- (b)catches are recorded and accounted for, and
- (c)by-catch that is fish is landed, but only where this is appropriate and (in particular) does not create an incentive to catch fish that are below minimum conservation reference size.

(6)The “equal access objective” is that the access of UK fishing boats to any area within British fishery limits is not affected by—

- (a)the location of the fishing boat’s home port, or
- (b)any other connection of the fishing boat, or any of its owners, to any place in the United Kingdom.

(7)The “national benefit objective” is that fishing activities of UK fishing boats bring social or economic benefits to the United Kingdom or any part of the United Kingdom.

(8)The “climate change objective” is that—

- (a)the adverse effect of fish and aquaculture activities on climate change is minimised, and
- (b)fish and aquaculture activities adapt to climate change.

*Consultation on the draft Joint Fisheries Statement January 2022*

**Bass Bytes** - Extracts from previous fisheries statements and reports with relevance to the ambitions and future success for a UK Bass Fishery Management Plan:

**JFS: “We will work together to ensure fish stocks are managed and, where necessary, recovered for the wider benefit of all, maximising the benefit to coastal communities.”**

**Net benefits 2004: “The overarching aim of fisheries management should be to maximise the return to the UK of the sustainable use of fisheries resources and protection of the marine environment”**

**“Net Benefits recommends the UK should adopt a large-stock strategy and use this to guide its position in EU negotiations for its key economic species. This will entail reducing catch in the short-term. Fishery managers should explicitly seek to maximise the value of commercial stocks and reduce the volatility of catch.”**

**Fisheries 2027 a long-term vision for sustainable fisheries:**

**“Economic returns are optimised. In most cases fish stocks and access to use them, either commercially or recreationally, are managed to maximise the long-term economic return to society.”**

**“Fishing techniques that cause damage to non-targeted species and habitats will carry economic cost proportionate to the damage caused. “**

**“Environmentally damaging behaviour will incur a financial cost”**

**Marine Strategy Framework Directive: “Good Environmental Status definition D3C3 – Primary: The age and size distribution of individuals in the populations of commercially-exploited species is indicative of a healthy population. This shall include a high proportion of old/large individuals and limited adverse effects of exploitation on genetic diversity.”**

**This discussion and proposal document is dedicated to the memories of**

**Donovan F Kelley MBE**

**Graham D Pickett**

**Peter Macconnell**

**John Leballeur**

**Derek Buesnel**

**Bryan Meade**

**Their work continues through BASS**

## About BASS

The Bass Anglers' Sportfishing Society was formed in 1973  
We are a fishing club and an organisation dedicated to the restoration of the European Sea Bass stock in UK waters

The society's members encourage the conservation, research and protection, as well as improve and educate others in the techniques of angling, for this, our premier sporting sea fish

We promote scientific research into bass biology and ecology and offer bursary funding for projects involving individuals, groups and students at postgraduate level

## Citizen Science

Our members collaborate and assist with university led research to better understand the habitat requirements of juvenile bass and their movements within estuaries and coastal environments. As part of this work we have assisted in the capture of bass for tagging and provided scale samples for analysis.

In partnership with marine conservation groups, members participate in recording marine strandings and beach clean-ups, as well as juvenile bass surveys to assess year class strength and provide information for University and Cefas-led research on bass recruitment.

We have supported and coordinated bass tagging studies to expand and confirm knowledge of the seasonal migrations of bass.

## Fighting for Bass

Campaigning for the restoration of bass stocks is our raison d'être. We have lobbied government at UK and EU level and have been instrumental in bringing destructive fishing methods, such as pair trawling for bass, with its associated cetacean bycatch, to a halt

We have been instrumental in raising the MCRS to allow more bass to reproduce and replace those lost through natural and human activities

We campaign to restore an abundant and healthy bass stock to support a sustainable fishery where recreational angling is given due recognition

