Sustainable Management of Sea Bass

A vulnerable species in a changing and dynamic climate

The European sea bass *Dicentrarchus labrax* is a Lusitanian (warm water species) at the northern limit of distribution in southern UK waters, growing slowly in northern temperate climates. Maturity is not achieved until 4-7 yrs of age. Females do not mature until they reach 42cm. (Fishbase). Adults undertake seasonal migrations from inshore waters to offshore spawning sites, entering coastal waters and estuaries in summer, migrating offshore in colder weather. Tagging studies support observations that sea bass tend to return habitually to the same coastal sites after spawning. (Pawson *et al*, 2008). The obligate habitats for juvenile bass (< 4 yrs) are intertidal areas such as estuaries and saltmarshes, with 0+ fish penetrating deep into low salinity areas. (Kelley, 1988; Laffaille *et al*, 2001; Elliott & Hemingway, 2002; Colclough *et al*, 2002; Pickett *et al*, 2004). Recent work shows that 0+ fish demonstrate strong site fidelity for specific saltmarsh nurseries (Green *et al*, 2012) in their first summer. This combination of slow growth, late maturity, spawning aggregation, and strong site fidelity increases the vulnerability of bass to overexploitation and localized depletion.

Bass distribution has expanded north in the past 25 years in response to a series of warmer summers, mild winters and against a general background of rising water temperatures. Adults remain for longer periods in the near-shore areas (Pawson, 2005; Pawson *et al*, 2007). Early stage bass eggs have now been reported from the southern North Sea (Imares, 2011), indicating the establishment of new local spawning grounds. In contrast to established offshore spawning activity off the Western Approaches, any new more northerly spawning activity is likely to be much more dynamic in terms of timing and location, reflecting changing conditions in the southern North Sea. Sea surface temperatures are now rising faster in this shallow constrained water body than anywhere else in the UK (IPCC, 2011). Higher temperatures lead to enhanced survival in expanding nursery areas. However, as a warm water species, survival of 0+ fish can be severely reduced in cold winters. Experimental evidence has shown that smaller 0+ fish (6g) do not feed at low ambient temperatures (<6°C) and lose weight even in the presence of abundant food. (Russell *et al*, 2006).
It is widely accepted now that there is an international decline in the bass stock. The cause is accepted to be a combination of overfishing affecting adult spawning stock and recent colder winters, reducing survival of juveniles in the nursery grounds. Solent Bass Survey data have shown that recent reduced abundance in nursery grounds is correlated with temperature. http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2014-11-05/213527/.

**International action** – The International Council for Exploration of the Seas (ICES) reported a continuing downward trend in bass numbers in June 2014. At the Scientific, Technical and Economic Committee (STECF) meeting in September, the need for urgent action to achieve sustainable management was agreed.

The UK position, supported by most other Member States, recommends short term action at the EU level with a package of technical measures including closing the major bass spawning areas to all commercial vessels that target bass during the spring months in order to protect spawning fish, and capping the allowable monthly catch per vessel as an EU standard.

The European Commission proposed the following emergency measures at the EU level (i.e. for all Member States targeting bass commercially and recreationally) to be introduced at the 2014 December Fisheries Council.

- Monthly catch limits (tonnes) and effort limits (days-at sea) between 1st January – 30th April for pelagic trawls with a cod end mesh size greater than 80 mm and a track history of catching bass in ICES division VIIe (Western Channel).
- Restrictions on access to ICES division VIIe for any pelagic trawl between 1st January – 30th April if the vessel has no previous history of fishing in VIIe between 2009 and 2011.
- Bag limits for recreational fishermen. A bag limit of only one bass, per person, per day. The limit will foreseeably apply to anglers and other recreational fishers e.g. nets, pots and spearfishing.

Many interests have also called for an increase in the Minimum Landing Size (MLS), a full ban on pair trawling in spawning aggregations, incentivisation of low impact commercial methods such as handlining and increases in mesh sizes. There is a consensus among member states around the STECF proposal for the development of a long term bass management plan.

No decision was reached on bass management at the December Fisheries Council. The UK made a reasoned request for the Commission to adopt specific emergency measures to alleviate the serious threat to the sea bass stock, under the terms of Article 12 of the Common Fisheries Policy Regulation (1380/2013). “To reduce fishing pressure by protecting the spawning aggregations, the UK proposes the adoption of measures to close area VIIe (the Western end of the English Channel) to pelagic trawlers targeting bass during January to April 2015.”

After due consultation and analysis of the scientific evidence, the Commission announced measures to avert the collapse of the declining bass stock on 19th & 26th January, 2015.

As an emergency measure, pelagic trawling during the spawning season (now underway) will be banned until 30th April, 2015. Effective immediately, the ban will apply to the Channel, Celtic Sea, Irish Sea and southern North Sea.
The Commission is now working with Member States to put in place a package of measures to manage commercial and recreational fisheries on bass more effectively. For recreational fishing this would include a limit of three fish per day per angler. Member States would also need to set a minimum size of 42cm so that fish are not caught, or are released, before they have reproduced.

For other commercial fisheries than pelagic trawling, this would also include limiting catches. The Commission is working with the Member States involved to prepare a proposal to the Council of Ministers as soon as possible.

The IFM congratulates the UK authorities and other interests for the part they have played in securing these announcements. The emergency measure will provide significant new protection to the spawning stock. However, it cannot be sustainable practice over the longer term to continue to target spawning stock. We would strongly recommend that either the ban becomes permanent, or at the very least is subject to regular review based upon the latest scientific information available.

We look forward to development of the additional measures referred to in the announcement and would hope to influence that debate. The historical position of UK fisheries administrations has been to call for European action on bass, given the highly migratory nature of the stock. We believe that there are some local measures, producing real localised benefits, which can be developed within a wider European framework.

Some aspects of stock management should certainly be developed at a supra-national level. The IFM would argue that we need more basic science at this higher level on how distribution and behaviour continues to respond to climate change. We will need to develop intelligent flexible and adaptive management measures to achieve sustainable stock exploitation over the longer term when set against a more dynamic environment. Warm summers will bring exploitation of stocks in more northerly climes, but in particular, we believe the impact of cold winters on juvenile survival has not been given sufficient emphasis in the current debate. Understanding and responding to this challenge may become one of the prime drivers of future management.

The emerging science base shows that given some of the stock changes described above, there can be local benefits from local action (Pawson 2005; Pawson et al, 2007). UK authorities will consider the need for domestic management of bass in the context of the outcomes of the current European debate. A number of member states are taking action now. A selection of some of those measures is provided below (MRAG, 2014; IFI, 2014).

In France, a MLS of 42cm has applied to recreational anglers since 2013. In the Netherlands, from 2014, pair trawling for bass is being phased out, fishing with bottom pair trawls will not be permitted in the Eastern Channel from September-December, 2014 and a MLS of 42cm has been applied to both recreational anglers and commercial handliners. In Ireland, a variety of control measures have effectively banned commercial fishing for bass since 1990. A MLS of 40cm applies, together with a bag limit of two bass per day for recreational anglers. Further actions are under consideration. Welsh Assembly Government are about to consult on bass measures.
We put forward the following recommendations for UK management options that should be considered as part of a wider European framework:

- **Bass nursery areas (BNA)** - Protection of juvenile bass below the MLS is important in those close inshore areas where these fish congregate. The Bass [Specified Sea Areas] (Prohibition of Fishing) Order 1990 was set to address this issue. It is widely recognised today that the regulation is flawed and the process needs review. Stocks continue to decline through over exploitation, and recruitment has been badly affected by recent poor winters. The BNA regulation applies only to bass captured from vessels. Anglers fishing from the shore can only be encouraged to respect the BNA and return bass. Juvenile bass are present in many more locations today as their distribution has expanded since 1990. Much larger areas need protection today. In a number of cases (eg Blackwater & Thames estuaries), the current distribution of young bass extends far beyond the original BNA.

Fish sampling by the Environment Agency in transitional waters (estuaries) for the Water Framework Directive has now yielded much new vital data on these nurseries in some 30 estuaries and other intertidal habitats. The Institute is actively engaged in advising individual Inshore Fisheries and Conservation Authorities (IFCAs) on how to identify, manage and promote new bass nurseries in some of these areas, based upon this data background. The Institute is also supporting new partnership survey programmes, through training and technical support, based upon the Water Framework Directive (WFD) sampling protocols to gather more such data in many more estuaries, in support of more informed and sustainable management regimes. Programmes and measures required under the WFD would suggest sensitive management in transitional and coastal waters (out to 1 nautical mile) in order to meet Good Ecological Status (or Good Ecological Potential in Heavily Modified Water Bodies). The IFM actively promotes more sensitive and sustainable management of our estuaries, given their strategic importance as marine nursery grounds and vital migratory corridors. Many studies have now demonstrated that these habitats are some of the most productive aquatic ecosystems available.

The Institute would strongly support a review of the current regulations to improve management and enforceability. The regulations should be more consistent and cater for all users and interests. Careful local consultation and tailoring of the options to suit local circumstances should be driven to achieve optimal engagement from all quarters. Together with improved and adequate resources, communications and signage, this will reduce illegal fishing and enhance intelligence led enforcement. Members of the Institute have direct personal experience in this field. The IFM will actively support and facilitate such developments.

- **Inshore netting controls** - IFCAs have inherited legacy byelaws from both the Sea Fisheries Committees and also from the Environment Agency (EA), where it had acted as the local sea fisheries committee in some estuaries, prior to the inception of the IFCAs. In some estuaries and coastal areas, there currently exists a complex set of interfacing IFCA sea fisheries byelaws, designed to protect marine fish and EA byelaws made under the Salmon & Freshwater Fisheries legislation, driven by the need to protect migratory salmonids and eels. Management in the near shore area is complex.
Bass and migratory freshwater management cannot be fully separated, leading in some cases to large bycatches of bass that are inadequately managed. There is a major opportunity here to see much more integrated management of all fisheries in the near shore area, through active collaboration over the IFCA byelaw review process. This will bring important management benefits in terms of stock conservation and reduced illegal activity and consequential enforcement costs. With adequate resources, consultation and promotion, a review of nearshore netting arrangements could simplify the management frameworks so as to derive maximum opportunities for protection of stocks whilst achieving greater levels of compliance through a simplification of the rules. Enforcement costs can be reduced through greater assets sharing. Detailed stakeholder engagement in these fisheries will further reduce costs through improved intelligence-led enforcement. The Institute can bring longstanding direct experience to bear here, in support of future actions.

- **Minimum legal size** – The IFM would urge the adoption of an MLS of at least 42cm immediately as one of the measures needed to move to more sustainable exploitation. Implementing a minimum size (MLS) is one of the most common tools applied today in both commercial and recreational fisheries around the world. The present EU MLS for bass of 36cm, set in 1990, is well below the minimum size at which female bass achieve sexual maturity (42cm). From first principles, catching fish before they have chance to spawn at least once, cannot make good management sense. An important opportunity was lost in the UK in the 2006 bass MLS consultation. A Cefas derived recommendation for a 45cm MLS was put forward on stock conservation grounds (as well as a truer reflection of the socio-economic conditions then evident), supported by a broad cross section of interests, but not adopted by the Fisheries Minister, after pressure from commercial quarters. The arguments made at that time in favour of an increased MLS still stand today. The Institute welcomes the announcement that Member States would need to set a minimum size of 42cm as part of a package of new measures. We would strongly recommend that in the interests of sustainable, balanced and equitable management, any new MLS should apply to both the recreational and the commercial sectors.

- **Mesh size implications of an increase in MLS** - Cefas (unpublished) information produced for the 2006 consultation concluded that if a minimum size were to be set at 45cm, then a minimum mesh size (stretched knot to knot) of between 105 and 110 mm would be needed to ensure the majority of bass caught in enmeshing nets exceed 45cm. The IFM would agree with the advice then provided by Cefas that given the uncertainty inherent in modelling the impact of changing mesh sizes, the industry should be fully consulted at an early stage. In response to the 2006 consultation, the EA noted that an increase in mesh size to achieve a bass MLS of 45cm would be likely to see greater interception of larger sea trout (EA, 2006). Pawson *et al.* (2005) noted that some of the success attributable to the original 1990 bass measures came from increased collaboration between the then National Rivers Authority (now EA) and the then sea fisheries committees. The success today of any bass management regime would still depend upon on such collaboration and the IFM would urge greater efforts by all in these matters. Partnership is especially important in the current recessionary phase for all public regulators. Analysis of the evidence suggests that the inshore mixed
net fishery may be able to adapt to increases in the mesh sizes. It is clear however that nearshore trawlers would be adversely affected.

• **Catch limits and bag limits** - Limiting catches is a common means of controlling fishing mortality. It may be applied in a process seeking to equitably distribute catch amongst all participants. Some limitation on recreational catch may be necessary to achieve the reduction in mortality advised by ICES (2014). The IFM welcomes the intention to consult over a daily bag limit for recreational anglers of three fish as an appropriate and balanced measure. The Institute would strongly urge that any bag limitation placed upon the anglers is matched by effective and equitable catch limitations upon the commercial sector. Although true comparisons are impossible, the advent of the Drew report in 2004, Sea Angling 2012, and now the MRAG report for the Blue Marine Foundation in Sussex, all suggest that, at the very least, the recreational and commercial sectors both provide significant socio-economic benefits to UK plc. These reports have made the socio-economic case clearly for balanced and equitable management, which should be seen to be delivered.

• **Unlicensed unregistered illegal fishing** - Ostensibly the management of unlicensed, unregistered illegal fishing in inshore fisheries is managed by the Marine Management Organisation. But in reality it is the IFCAs and the EA which have the assets and officers to police the nearshore areas (where the majority of this illegal activity is occurring). These Agencies are not warranted to deal with this problem. There is a need to address this administrative issue. There is also an opportunity to simplify the current rules. Bag limits offer one such opportunity, as do restrictions on any form of netting other than from registered vessels. The recent expansion of inshore bass populations has seen a significant growth in highly mobile gill netters taking significant numbers of under-sized bass. Corresponding growth in by-catches of migratory salmonids under these circumstances has also caused problems for the EA. Despite recent prosecutions, it is clear that under the present organisational arrangements no single regulator has the ability to police this situation effectively. There is an urgent need for the IFCAs to complete their legacy bylaw review processes, as it provides a unique modern opportunity to address these issues in a fully co-ordinated manner. The review should also include providing the necessary resources to these agencies. The IFM has considerable experience in this field and can offer effective support.

• **A recreational species** - The Net Benefits Report (2004), recognised by many as an important policy review in UK terms, included a recommendation to consider some species of fish, such as bass, as predominantly or wholly for recreational use, if the socio-economic case could be established. This recommendation was later supported by the then Environment, Food and Rural Affairs Committee (EFRA) Committee. That case has been well demonstrated and documented with bass in Ireland, where the socio-economic benefits accruing to the more remote rural communities in southern Ireland are indeed very significant (IFI, 2014). Some would suggest that the reports cited above have begun to make that case for bass in English waters. This issue was debated at length in the excellent House of Commons debate on bass on December 3rd, 2014. The IFM takes a balanced view. We strongly support active promotion and development of the recreational angling fishery, given the now overwhelming evidence of the socio-
economic benefits that can accrue. We also believe that small-scale inshore fisheries are a key socio-economic component of many coastal communities, contributing to cultural identity, recreation, quality of life, heritage and social cohesion (Acott et al., 2014). Additionally they are often among the more sustainable forms of commercial fishing, if appropriate management and enforcement regimes are in place (Acott et al., 2014). Local management for both recreational angling and commercial exploitation has to be set against a supportive and complementary European background. For example, it would be possible to remove large sections of the inshore commercial bass industry but not accrue much additional value to the recreational sector if the international fishery continues to take the majority of the harvest, as at present. If a robust mix of international and local measures can be driven forward, there is no reason why a buoyant recreational angling sector cannot co-exist alongside high value low impact local sustainable fisheries targeting larger bass.

- **New nursery capacity** – Nursery capacity is limiting production. 80% of the optimal nursery grounds for early stages of bass (saltmarshes) have been lost through land claim and sea defence works over the past 200 years. Further losses are happening now as a result of coastal squeeze (Laffaille et al., 2001; Colclough et al., 2005). The need to fund new flood risk measures to counter storm surges and sea level rise provides an opportunity to build vital additional nursery habitat. We know how to construct new habitats to provide additional defences, which also act as new nurseries (Colclough et al., 2005; Dixon et al., 2007). These new habitats can be built and managed as protected nurseries. There may even be contributory funding available through the European Maritime and Fisheries Fund, given the fisheries benefits accruing. Enhancing and protecting nursery capacity will be a vital element in future sustainable management.

The Institute has significant and varied experience in the management of estuarine and inshore species, and is actively engaged in the development of more sustainable bass fisheries, for the common benefit of all.

**References**


Anon, 2015. Maturity studies for *Dicentrarchus labrax* ONLINE http://www.fishbase.org/Reproduction/MaturityList.php?ID=63&GenusName=Dicentrarchus&SpeciesName=labrax&fc=487


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The Institute

The Institute of Fisheries Management (IFM) is an international organisation of people sharing a common interest in the modern management of recreational and commercial fisheries. The aims of the Institute are:-

- To promote effective sustainable fisheries management;
- To provide the technical and general knowledge necessary for competent fisheries management;
- To advance the standing of fisheries management as a profession.

The Institute, in partnership with a number of other UK entities concerned with the environment, is one of the Constituent Bodies of the Society for the Environment, which by Royal Charter is empowered to award the qualification of Chartered Environmentalist.

The IFM has established a number of positions in the marine field. These are:-

- The promotion of a healthy fish resource, available equally to all users, with maximal associated benefits for society and the economy
- Holistic integrated and inclusive management based upon the ecosystem approach and the precautionary principle
- Full inclusion of recreational sea angling in the management process
- Sustainable well regulated exploitation based on sound science
- Effective, robust, integrated enforcement following the principles established in the UK for Better Regulation
- Greater integration of fisheries and environmental policy
- Greater emphasis on stock and habitat protection and enhancement measures
- Greater emphasis on measures which tend to reduce discards and restrict unsustainable fishing and illegal landings
- Greater emphasis on the application of effort controls to marine fisheries management. These may include limitations on fishing methods and the temporary closure of fishing grounds to protect spawning and nursery grounds
- The promotion of branded, local, high value, low impact, commercial fisheries
- Greater recognition in management regimes of the high importance of intertidal areas as key nursery grounds for the early life stages of a range of economically significant species.