Devon and Severn IFCA outline of planned work relating to European sea bass, *Dicentrarchus labrax*, October 2015

Following a review of the causes of recent declines in European sea bass (*Dicentrarchus labrax*) and associated changes in management at a European level, Devon and Severn IFCA stated that it would review possible additional work that the IFCA could undertake which would aid bass conservation efforts (Ross, 2015). An initial review of the available literature is summarised in Table 1, below. The review compares the existing knowledge of seasonal habitat use by bass throughout their life-cycle and the current management measures in place which limit the fishery effort at each life-history stage. It is clear from the review of the literature that three separate areas are used by bass and that correct management in all three of these areas is necessary to offer the level of protection needed to meet the recommendations of ICES (ICES 2015). Options for improving bass management in each area are described below. Where little information exists future research is outline and the resulting work plan is summarised in Table 2.

Bass Nursery Areas

The review of available literature emphasizes the fact that estuaries in Devon are already well provisioned for in terms of management thanks to the vast majority being designated as Bass Nursery Areas (BNAs). BNAs are relatively well understood, and are thought to have been an effective mechanism for protecting juvenile bass (Pawson et al. 2005). However legislation could be strengthened to offer greater protection and this is currently being addressed as part of the wider review of netting byelaws in the Devon and Severn IFCA district. Additionally the existence of un-designated areas which are known (from published literature and anecdotal information) to be important to bass in North Devon, Somerset, South Gloucestershire and Gloucestershire could be considered for designation. *It should be noted that Defra are currently in the process of reviewing the Statutory Instrument that created BNAs and it is important that any work the IFCA undertakes feeds into this process.* Therefore possible actions for the IFCA in order to strengthen the conservation benefits of bass nursery areas include:

- Consideration by the Authority of greater restriction on netting in estuaries to reduce possible bycatch of bass
- Consideration by the Authority of the implementation of a deeming clause in estuaries, which would improve the ability of the IFCA to enforce the existing legislation and could further the conservation objectives of BNAs
- Further research into the abundance and habitat use of bass in un-designated areas thought to be important to bass, relative to existing BNAs:
    - Parrett Estuary and Steart Marshes, Somerset
    - Upper Severn Estuary, South Gloucestershire and Gloucestershire
    - Lower Taw-Torridge estuary, Devon
- Close communication between the IFCA and Defra (and other stakeholders and interested partners) to ensure timelines of the planned IFCA and Defra work are complimentary – for example through the setting up of a South West Advisory Group for bass.

Inshore waters

The key finding of the review is the possible vulnerability of sub-adult bass outside Bass Nursery Areas. Whilst BNAs are likely to be very effective for 0-group and 1-group bass, older juvenile and

adolescent bass (from 2+ years) may spend increasing amounts of time outside estuaries in inshore waters (Table 1, Pickett and Pawson 1994). On the 1st September 2015 the 36cm Minimum Landing Size for bass was replaced by a Minimum Conservation Reference Size (MCRS) of 42cm. This means that whilst targeting bass less than 42cm is not permitted, sub-adult bass in inshore waters may still be vulnerable to:

- Bycatch by commercial fisheries, which are targeting adult bass if juvenile and adolescent bass are using the same areas at the same time of year as adult bass and can be captured by the fishing method being used.
- Bycatch by recreational anglers who are targeting adult bass if juvenile and adolescent bass are using the same areas at the same time of year as adult bass and can be captured by the fishing method being used.
- Directed fishing effort by recreational anglers who are practicing catch-and-release.
- Directed illegal fishing effort by any fishery/sector not adhering to the MCRS.

Research questions generated by the possible vulnerabilities identified above are:

- Do sub-adult bass aggregate in estuary mouths & adjacent inshore areas and are they vulnerable to being taken as bycatch by fisheries targeting adult bass moving into and out estuary areas?
- Do juvenile bass aggregate in other inshore areas? If so where, when, why? (i.e. locations, seasonality and causes of aggregation).
- Do sub-adult and adult bass aggregate in the same areas at the same time or do they segregate by age class?
- Does fishery effort overlap spatially and temporally with aggregations of sub-adult bass in inshore areas?
- What are the survival rates of bass which have been discarded from different fisheries?

Currently there is relatively little fine-scale information on the ecology and spatial habitat use of sub-adult bass outside nursery areas, which could inform management decisions. Therefore the IFCA has identified the collection of improved data on this life-history stage to be a priority. D&S IFCA will be co-funding a PhD with Plymouth University and Bridgwater College, starting in January 2016 to address some of these questions (Annex 1). The formation of an Advisory Group, as described above would be beneficial to guide the PhD and ensure the results are quickly available to other interested stakeholders and partners.

Offshore waters

The fate of bass outside inshore waters is obviously of equal concern in relation to the ecology of the species, but is less directly relevant to the IFCA. The IFCA will take an active role in any wider group, which will consider bass management in order to push for effective, complementary management outside the 6nm limit. This will partly be through the South West Advisory Group for bass, discussed above and by continued discussions with Defra and other policy makers.

References

ICES (2015) Advice on fishing opportunities, catch, and effort; Celtic Seas and Greater North Sea Ecoregion, Section 5.3.43: Sea bass (Dicentrarchus labrax) in Divisions IVb and c, VIIa, and VIId–h (Central and South North Sea, Irish Sea, English Channel, Bristol Channel, Celtic Sea).

Pawson M.G., Pickett G.D. and M.T Smith (2005) The role of technical measures in the recovery of the UK sea bass (Dicentrarchus labrax) fishery 1980-2002, Fisheries Research, 76: 91-105.

Pickett and Pawson (1994) Sea Bass: Biology, exploitation and conservation, Fisheries and Fisheries Series 12, Chapman and Hall, London.

Ross E.J. (2015) European sea bass (*Dicentrarchus labrax*); Ecology, stock status and management update, Devon and Severn IFCA review paper.

Table 1. Summary of seasonal habitat use of European sea bass and existing management measures throughout the species life history. Areas bordered in green are those identified as being priority work areas for Devon and Severn IFCA. *Full-length, fully-referenced version available on request.*

Devon and Severn IFCA European sea bass life-history and management summary																
Life-history stage 1	**Life-history stage 2**	**Estuary use**				**Existing management measures**	**Inshore waters use**				**Existing management measures**	**Offshore waters use**				**Existing management measures**
		Spring	**Summer**	**Autumn**	**Winter**		**Spring**	**Summer**	**Autumn**	**Winter**		**Spring**	**Summer**	**Autumn**	**Winter**	
Egg	Juvenile (<32cm)	N	N	N	N		N	N	N	N	N/A	Y	Y	Y	Y	N/A
Larvae	Juvenile (<32cm)	Y	Y	Y	N	N/A	Y	Y	Y	N	N/A	Y	Y	Y	Y	N/A
Fry	Juvenile (<32cm)	Y	Y	Y	Y	N/A	N	N	N	N		N	N	N	N	
0-groups	Juvenile (<32cm)	N	Y	Y	Y	BNA (Devon only)	N	N	N	N		N	N	N	N	
1/2/3-groups	Juvenile (<32cm)	Y	Y	Y	Y	BNA (Devon only)	Possibly - 2 group +	Possibly - 2 group +	Possibly - 2 group +	Possibly - 2 group +	MCRS Only	Poss	Poss	Poss	Poss	MCRS Only
4-groups	Adolescent (32-42cm)	Y	Y	N	N	BNA (Devon only)	Y	Y	Y	Y	MCRS Only	N	N	Poss	Poss	MCRS Only
Adolescents	Adolescent (32-42cm)	N	Y	Y	N	BNA (Devon only)	N	Y	Y	N	MCRS Only	Y	N	Y	Y	MCRS Only
Adults	Adults >42cm	N	Y	Y	N	BNA (Devon only)	Poss	Y	Y	Poss	Monthly catch limits	Y	N	Y	Y	Monthly catch limits + temporary 2015 closure of pair-trawl fishery of spawning aggregations

	Protected by bass nursery areas
	Managed by catch limits
	Minimum Conservation Refernce Size only management

Table 2. Devon and Severn IFCA work plan for bass, October 2015

Habitat	Life-history stage	Management considerations	Action	Lead organisations & partners	Further research required?	Start Date	End Date
Estuary	All	Consideration of greater restriction on netting in estuaries to reduce possible bycatch of bass	D&S IFCA netting byelaw review	D&S IFCA	No	Underway	2016
Estuary	Adult	Consideration of implementation of a deeming clause in estuaries	D&S IFCA netting byelaw review	D&S IFCA	No	Underway	2016
Estuary	All	Consideration of designating new bass nursery areas in locations thought to be important to bass that are currently un-designated	PhD	Plymouth University, D&S IFCA, Bridgwater College	Yes	Jan-16	Jan-19
Inshore waters	Sub-adult	Consideration of whether greater protection for sub-adult bass (for example through spatial/ temporal management) in inshore waters would further conservation objectives for bass	PhD	Plymouth University, D&S IFCA, Bridgwater College	Yes	Jan-16	Jan-19
All	All	Co-ordination of research and management effort across IFCA and other management districts to ensure effective joined-up working and avoid duplication of effort.	Formation of South West Advisory Group for bass	Likely to be lead by D&S IFCA and Plymouth University PhD student with input from; IFM Bridgwater College, University of West of England, Cornwall IFCA, Southern IFCA, EA, MMO, Cefas, commercial and recreational sectors	N/A	Jan-16	?

Annex 1: Advertisement for PhD researcher

Advertised via www.jobs.ac.uk on the 06th November 2015.

http://www.jobs.ac.uk/job/AMI823/phd-research-studentship-ecology-and-distribution-of-european-sea-bass-in-inshore-and-coastal-waters-in-south-west-england/

CAREERS WITH PLYMOUTH UNIVERSITY

PhD Research Studentship - Ecology and distribution of European Sea Bass in inshore and coastal waters in South West England

Plymouth University - School of Marine Science and Engineering

Location:	Plymouth	**Placed on:**	5th November 2015
Funding amount:	£14,057 Per annum	**Closes:**	22nd November 2015
Hours:	Full Time		

Faculty of science and engineering, Marine Institute

Funded PhD Research Studentship beginning 1st January 2016

Supervisors

Dr Emma Sheehan[1], Prof Martin Attrill[1], Dr Elizabeth Ross[2], Tim Robbins[2] and Dr Shaun Plenty[3]

[1]Plymouth University Marine Institute, Plymouth

[2]Devon and Severn Inshore Fisheries and Conservation Authority, Brixham

[3]Bridgwater College, Somerset

Project Description The European sea bass (*Dicentrarchus labrax*) fishery is valuable for the commercial and recreational sectors. As a result of increasing fishing pressure and changing environmental conditions for a fishery at its most northerly range, bass populations in UK waters are experiencing notable fluctuations. In the early 1990s bass nursery areas were designated to protect juvenile bass in estuaries and in 2015 new restrictions on commercial and recreational fisheries were introduced in response to a call from ICES (International Council for the Exploration of the Sea) for an 80% cut in the fishing mortality of bass.

This study aims to provide policy-relevant information on the distribution and ecology of bass within the Devon and Severn Inshore Fisheries and Conservation Authorities' district (DS IFCA). Additionally, by working with commercial and recreational fishing sectors to map fishing pressure in the district, the effectiveness of existing and future management strategies will be identified. Based at Plymouth University, this PhD will provide a unique opportunity to work with statutory fisheries managers and collect data that will allow DS IFCA to make evidence based decisions to help manage a sustainable bass fishery.

Eligibility Applicants should have a minimum of a first class or upper second class bachelor degree. Applications from candidates with a relevant Masters qualification will be welcomed. The candidate will gain experience in boat and shore based field work; estuarine and marine fish identification and morphometrics, fish tagging, remote video and laboratory skills.

Funding The studentship is supported for 3.5 years and includes full Home/EU tuition fees plus a stipend of £14,057 per annum. The studentship will only fully fund applicants who are eligible for Home/EU fees with relevant qualifications. Applicants normally required to cover overseas fees will have to cover the difference between the Home/EU and overseas tuition fee rates (approximately £10,800 per annum).

If you wish to discuss this project further, please contact Dr Emma Sheehan. Applications must be made according to the details below.