Devon and Severn IFCA response to NRW and MMO consultation for aggregate dredging, sampling from Area 531, North Bristol Deep, Severn Estuary, *MLA/2019/00457*.

Introduction and Scope of Response

Devon and Severn Inshore Fisheries and Conservation Authority (D&S IFCA) is the statutory manager of sea fisheries from baselines out to six nautical miles in English waters as shown in Figure 1. The powers and duties of the D&S IFCA are provided by the Marine and Coastal Access Act (2009). The ten regional IFCAs have a shared vision:

"Inshore Fisheries and Conservation Authorities will lead, champion and manage a sustainable marine environment and inshore fisheries, by successfully securing the right balance between social, environmental and economic benefits to ensure healthy seas, sustainable fisheries and a viable industry."

The D&S IFCA response, below, focuses on seafish rather than migratory fish (salmon, sea trout, river and sea lamprey, twaite and allis shad and European eel). The Environment Agency is responsible for the management of migratory fish and fisheries relating to these species. The Devon and Severn IFCA fisheries expertise relates to the English waters of the Severn Estuary, although comments on fish and habitats are more generic to the Severn as a whole.

Adequacy of the Environment Statement

Devon and Severn IFCA has some concerns relating to the adequacy of the Environmental Statement. Concerns relate to the interpretation of existing evidence, including the lack of critical review of the biases of existing data and how these data apply to the proposed site.

The low level of sampling is a particular cause for concern, especially given the potentially inappropriate methodology for characterising the fish community, and the potentially outdated nature of much of the benthic sampling data (some of which is 48 years old). Again, a more critical review of the fish sampling work undertaken and an open discussion of the implications of this for the interpretation of results and resulting risks is urgently needed, alongside additional sampling that is more representative of the area and seasonality of the biological community.

Species presence - interpretation of existing data

The fact that the ES provides very limited critical review of the primary data sources, despite the implicit sampling biases is of concern.

Power station data have biases in how well they sample different species and/or life-history stages or size classes of fish depending on: The position of the intake in the estuary; the depth and position in the water column of the water intake; the surrounding habitat; the water velocity of the intake and relative swimming ability of fish (i.e. larger fish can often swim away from the intake, so generally there is a bias towards smaller individuals/ species although very small fish <25mm are often not retained efficiently); the tidal state of sampling (at Hinkley this is always mid-way between neaps and springs – Henderson and Holmes, 1991); and diurnal phase of sampling.

The review by Ellis *et al.* (2012) highlights a number of issues relating to data quality which should be borne in mind when interpreting the data and in the introduction states that: "*This report describes the sources, spatial and temporal coverage and limitations of the data, including where there are data gaps. Using the maps in isolation may result in misrepresentations of the data, so in all cases the supporting rationale should be considered.*" Data from national groundfish surveys were the basis for the mapping of the occurrence of juvenile fish and nursery grounds in the Ellis *et al*. (2012) paper, and the methods and locations sampled will affect how well we know a particular location. Because the research vessels used in the surveys rarely fish in water <20m deep, estuarine sites are not fully represented by the Ellis *et al.* (2012) report. The report also shows that the sampling stations do not enter into the Severn Estuary as far as the Area 531 site. Other biases are introduced when the gear types used are considered. The trawl surveys which underpin the Ellis *et al.* (2012) description of the Bristol Channel were originally designed to sample juvenile plaice and sole, therefore larger bodied species may be able to outswim the trawls and in particular adult rays and skate are likely to be underestimated. The surveys which underpin the Ellis *et al.* (2012) work were generally undertaken on an annual or sometimes biannual (spring and autumn) so do not capture seasonality, which is likely to be of critical importance in the Severn Estuary and inner Bristol Channel where many marine species move in and out of the estuary on a seasonal basis.

In terms of the benthic fauna, the data used in the ES are very limited. The ES relies in part on a survey that is now 20 years old for site-specific data on the benthic fauna, and on benthic sampling from 1972-1973 – these data are now almost 50 years old, and the intervening years have seen substantial shifts in the distributions and abundances of many marine species, particularly in response to climate change. The ES does not adequately consider that the microbenthic community may have altered since the surveys. In addition, other surveys (e.g. WFD TRaC surveys) demonstrate substantial interannual variation in the fish species observed in samples taken from the Severn. High interannual variation in such data raises additional concerns about the legitimacy of using limited samples taken from just one or two years of sampling between 20 – 50 years ago. Additional sampling using cores (for the 2012 Severn Estuary SPA and SAC condition assessment) took place near to Area 531, but in intertidal, rather than subtidal areas (Area 531 is subtidal).

Species presence – regional trawl surveys

The ES refers to trawl surveys undertaken in Area 470 in 2000. The surveys are described as being undertaken to provide data on epibenthos and fish species and describes the use of a 2m beam trawl in two locations. D&S IFCA would suggest that this an insufficient survey to be able to describe the Area 531 fish community adequately.

Firstly, a 2m beam trawl is not generally suitable for targeting small- and medium-bodied demersal fish (Cefas 2005), which are better sampled using a 4m-beam trawl (Cefas 2005). Whilst 2m beam trawls are used in Young Fish Surveys, these are specifically aimed at sampling very small juvenile fish, not describing a community. The methods cannot be deemed suitable for medium or large bodied fish which are likely to use the area such as turbot, brill, sole, plaice, flounder, small-eyed, blonde and thornback ray. A justification of the use of a 2m beam trawl and a critical review of its likely effectiveness should be provided in order to make any interpretation of the results meaningful. Additionally, this amount of sampling cannot account for seasonal variations in catch. This is critical in the Severn Estuary/ inner Bristol Channel where many fish move in and out of the area on a seasonal basis. In order to adequately describe the fish use of the area, seasonality must be taken into account, and more frequent surveys undertaken to describe the current (rather than

historic) community composition. Similarly, different states of the tide should be considered within the sampling methods. Any survey which aims to characterise the fish use of the site should include seasonal sampling, or at least a critical review of the time of year of sampling and likely capture efficiency for certain species. These comments on the efficacy and relevance of 2m beam trawls also hold for the use of 1.5m Aggasiz trawls used in the 1999/2000 surveys of the North Middle Ground area, which are discussed in more detail below.

Nursery and spawning areas

Again, there is an over-reliance on Ellis *et al.* (2012) to define nursery and spawning areas, when this source does not adequately cover the area in question. Juvenile bass are found throughout the Severn Estuary, and it is an important nursery area for this species. Specifically, both the Parrett and Inner Severn have been proposed to Defra as future bass nursery areas, but it is likely that much of the Severn Estuary is used by different size classes of bass. Juvenile cod (known locally as codling) are abundant in the estuary in the winter months and are thought to belong to a Bristol Channel/ Eastern Celtic Sea stock (Cefas 2011). This is not captured in the Ellis *et al.* (2012) report, probably because the underlying sampling does not take place in winter months when cod are abundant in the Severn Estuary. Anglers have also reported catching juvenile tope close to Minehead and Watchet so a nursery area may be found here. As previously reported, it seems increasingly likely that herring may be spawning in the vicinity of the Somerset coast. Again, the ES does not critically review the data provided in Ellis *et al.* (2012).

The ES compares surveys of the North Middle Ground area (5 km north east of the site) with Cefas regional spawning/ nursery area information to indicate the significance of the North Middle Ground as a nursery/ spawning ground. However, the North Middle Ground surveys used different methods to the Cefas surveys, which were also carried out in very different regions and different depths. This raises further concerns about the relevance of the comparison, and the robustness of the conclusions drawn. Furthermore, the North Middle Ground surveys were conducted in 1999–2000 which, as highlighted above for other surveys, is problematic in terms of (a) the sampling frequency, (b) the age and contemporary relevance of the data, and (c) the lack of consideration of the potential effects of climate change on species' distributions and abundances. Furthermore, the ES provides no information on the critical differences between Area 531 and North Middle Ground, despite the latter being at least partially intertidal, whereas Area 531 is subtidal and may therefore differ substantially in ecological terms.

Significance of these works: protection of the environment, protection of the local biodiversity

The importance of different habitats to fish in the Severn Estuary is largely unknown, though in other locations subtidal *Sabellaria spinulosa* has been found to be an important habitat for fish (Pearce at el., 2013). The discovery of *Sabellaria* in Area 531 and the Secondary Impact Zone (e.g. in 2016 grab samples) raises concerns about the impact of dredging on possible *Sabellaria* in the region. D&S IFCA therefore welcomes the commitment, expressed in the ES, to a review of full-coverage side-scan data prior to any dredging activity (if this activity were to be allowed), and the establishment of non-dredging exclusion zones (if this activity were to be allowed, notwithstanding D&S IFCA's other concerns expressed in this response). The presence of *Sabellaria* should trigger a review of the assessments provided in support of this project. Sandy sediments are important to a range of species; in particular this area may be important for turbot, brill, sole, plaice, dab, blonde, small-eyed and thornback rays. It is not thought that the underlying data used (Power Station Sampling, Ellis

et al., 2012 and very limited sampling) are sufficient to fully characterise the fish assemblage and therefore undertake an assessment.

D&S IFCA is also concerned about the lack of consideration apparently given to the Annex I habitats (particularly H1110). The objectives for feature H1110 include the maintenance of the variety and distribution of sediment types across the feature, and the maintenance of the gross morphology of the feature (including its depth and profile). By the nature of the aggregate extraction process, these objectives will be directly impacted. When site integrity and functionality are considered, alongside the protection of the overarching 'estuary' feature it is also clear that this site should be given the same protection as the rest of the EMS. Additionally, because many of the fish species will move in and out of the estuary, seasonally, in relation to food supply and according to tides, many more fish may transition through the Area 531 site than use it habitually or for a specific function.

Significance of these works: prevention of the interference with other legitimate uses of the sea

Local commercial fisheries operate out of Minehead, and significant commercial fisheries operate out of North Devon ports, particularly targeting whelk, crab and lobster. The region also has significant recreational sea angling interests. Because of the unsatisfactory coverage of potential impacts on fish in the ES and the potential for changes in estuaries to impact the health of sea fisheries (Elliot 2012), D&S IFCA is not wholly satisfied that the proposed dredging will not interfere with existing fishing activities.

References

Cefas (2005) Standard Operating Procedure 1385 (1): Processing 2-metre beam trawl samples. Accessed online February 2017: http://www.marbef.org/qa/documents/CEFASSOP1385_1.02mBeamTrawling.pdf

Cefas (2011) BEEMS Technical Report TR148: Reassessment of juvenilecod impingement predictions at Hinkley Point C. Accessed online February 2017: Cefas 2011 BEEMS https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010001/EN010001-005163-HPC-NNBPEA-XX-000-RET-000150%201.pdf

Ellis, J.R., Milligan, S.P., Readdy, L., Taylor, N., and Brown, M.J. (2012) Spawning and Nursery Grounds of Selected Fish Species in UK Waters. Sci. Ser. Tech. Rep., Cefas Lowestoft, 147: 56p.

Henderson, P.A., Holmes, R.H.A., 1991. On the population-dynamics of dab, sole and flounder within Bridgwater Bay in the Lower Severn Estuary, England. Netherlands Journal of Sea Research 27, 337–344.

Pearce, B., Hill, J.M., Wilson, C., Griffin, R., Earnshaw, S. and Pitts, J. 2011. Sabellaria spinulosa Reef Ecology and Ecosystem Services. The Crown Estate 120 pages ISBN 978-1-906410-27-8. First Published 2013. This report is available on The Crown Estate website at www.thecrownestate.co.uk