EVIDENCE REVIEW OF SCALLOP CONSULTATION 2016 RESPONSES

Welsh Government
Fisheries Science
Department
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SCALLOP CONSULTATION – SCIENTIFIC INPUT INTO CONSULTATION REPONSES

Background

Welsh Government Fisheries Science Department was asked to provide scientific input to any questions relating to data and evidence that were raised in the public Scallop Consultation 2016.

Approach

Consultation responses that were of a technical nature were reviewed by WG Senior Fisheries Science Leader. Questions and concerns surrounding data and evidence were reviewed and collated into main areas of concern for review.

The main areas of concern were as follows:

- Misinterpretation that Scallop Dredging does not already occur in Cardigan Bay, together with a view of the lack of detailed evidence and Habitats Regulations Assessments surrounding the current fishing regime.

- Scallop Dredging will have a significant effect on the Bottlenose Dolphin (*Tursiops truncates*) population.

- Effects of dredging on the full Marine Protected Area (MPA) of Cardigan Bay, with specific relation to benthic communities and seafloor habitats.

- Lack of wider consideration to Habitats Regulation Assessments for the full Special Area of Conservation (SAC).

- Effect of dredging on sediment disturbance and pollutants in marine mammals.

- Reliability of main evidence utilised in consultation.

These main concerns will be addressed together with supporting evidence. This paper does not represent a full audit of all applicable data, evidence and decision processes, its aim is to provide an overview of main data and evidence sources which if necessary can be elaborated on.

1.1 *Scallop Dredging Cardigan Bay – Overview and Current Habitats Regulation Assessments*

Scallop dredging has occurred in Cardigan Bay for over 30 years, with the main activity occurring outside 6nm (Vanstean and Silva, 2010.) The fishery was regulated prior to 2005 by restrictions to gear and a minimum landing size on scallops. The 2005 Scallop Fishing (Wales) Order added further protection by imposing a closed season to scallop dredging.

Following a complaint to the European Commission by the Whale and Dolphin Conservation Society with regard to the levels of fishing activity in the Cardigan Bay Special Area of Conservation (SAC), the scallop fishery was closed mid season in 2009. The closure was pending potential infraction proceedings from the EU COMM with relation to Welsh Ministers' duties under the Council Directive 92/43/EEC of 21 May 1992 (Birds and Habitats Directive). The complaint addressed the questions that (1.) Scallop dredging would have an adverse effect on features of the SAC, namely Bottlenose Dolphins and Cobble Reef, and that (2.) scallop dredging would have a negative impact on the benthic organisms that provide prey for fish on which dolphins feed.

Due to the limited available data Welsh Government were unable to conduct a Test of Likely Significant Effect (TLSE) in accordance with Article 6 (2) assessment to satisfy statutory duties under the Habitats and Birds Directive.

Welsh Government therefore extended the closed season for all scallop dredging until the end of February 2010 (Prohibition of Fishing for Scallops (Wales) Order 2009 No. 2721 while a programme of research and data collection was undertaken to provide information in relation to the features of the SAC that were of concern. This evidence would enable WG to undertake an Appropriate Assessment (AA) to assess any risk of damage to these site features by scallop dredging.

The Scallop Association on behalf of Welsh Government commissioned a review assessing the Risk of Scallop Dredging on Dolphin Prey Interactions in Cardigan Bay SAC (Woolmer, 2009). The report utilised the best available evidence (to date) and used established information on the ecology and life history of prey species, known habitat preferences and the sensitivity of those habitats to disturbance (Woolmer, 2009) (This work was updated by Woolmer, 2010 when additional data became available).

The report undertook a structured risk assessment using established information on the ecology and life history of prey species, known habitat preferences and the sensitivity of those habitats to disturbance. It also considered additional species present within the area and the potential for those species to be prey sources. If a prey source was associated with a particular habitat type the HABMAP GIS (desk top mapping system) (Robinson *et al*., 2008; cited in Woolmer (2009)) was examined for likely biotopes in the SAC, these were then translated into Sensitivity Habitat Type and assessed for sensitivity using the Countryside Council for Wales (CCW, now Natural Resources Wales (NRW)) Fishing Sensitivity Matrices. Woolmer (2009) concluded that the likelihood of interactions between dolphin prey items and scallop dredges is low risk due to the highly mobile and pelagic life history of the main prey species.

The main prey species are documented as pelagic, spending most of their time in the water column and are not linked to a specific habitat type (Woolmer, 2009), with other species being demersal with a wide habitat preference. The risk of interaction with demersal species is more likely,

however experimental studies have shown that by catch in experimental dredge operations is very low (Kaiser *et al*., 1996; Jenkins *et al*., 2001).
In addition to Woolmer (2009) Welsh Government commissioned a detailed assessment of the habitats in Cardigan Bay SAC to establish the extent of the protected features of the SAC and the wider benthic substrate (Hinz *et al*., 2010 a and b). This would form part of the evidence base that was utilised to inform the appropriate assessment relating to WG duties under Article 6 of the habitats directive.

The two studies undertook extensive sampling of the habitats of Cardigan Bay SAC in June 2009 and December 2010. In total 53% (504 km^2) of the SAC were surveyed, with habitat and benthic communities described in detail. The site features that were of particular concern with relevance to impacts of scallop dredging were cobble reefs. These were classified utilising The Joint Nature Conservation Committee (JNCC) definitions of 'stoney reef' (See Irving 2009 for a detailed review). A combination of standardised methodologies were used and found that cobble and boulder habitats were relatively rare and restricted to the southern parts of the survey area (Hinz, 2010b). The percentage of cobbles was found to be higher in the December survey (West of the SAC) than in the June 2009 survey to the East (see Hinz *et al*., 2010a), with the average percentage of cobbles at sites where cobbles occurred being 22%. Highest numbers of species were recorded in cobble and boulder habitats which occurred at stations located nearest the coast. In contrast, stations with a high percentage of sand habitats generally had low numbers of species (Hinz, 2010b).

Hinz (2010 b) also analysed the areas of the SAC for evidence of dredge marks. Most of the marks occurred within the areas that were opened to scallop dredging between March and June 2010, there was some evidence of dredge marks within the closed area (Hinz *et al*., 2010b). Dredge marks are almost certainly short lived and are thought to last only a few weeks due to the dynamic character of the area (Hinz *et al*., 2010b) (This is discussed in more detail below 1.2). Further sampling was conducted to ascertain whether there were differences between abundance, species richness and community

composition between the open and closed areas between Dec 2009 and June 2010. Statistical analysis revealed that there was no significant effect caused by protection of the area i.e. there was no significant difference in the abundance of fauna at sites that were open to fishing compared to sites that were closed. However season did have a significant effect, with abundances of fauna observed in the camera tows being significantly higher in June 2010 compared with Dec 2009 (Hinz *et al*., 2009 a and b). This may be associated with seasonal new growth and recruitment, which generally occur in spring as a result of greater food availability associated with plankton blooms. Due to the dynamic nature of the area (discussed below) the study concluded that natural processes within the area may outweigh the negative effects associated with scallop dredging (Hinz *et al.*, 2010b).

Further to the work of Hinz *et al*., (2010a) and Woolmer (2009) The Welsh Scallop fishery pursuant to the Scallop Fishing (Wales) (No.2) Order 2010 came into effect, which added additional restrictions associated with scallop dredging in Welsh Waters. While additional data was collected Welsh Ministers allowed an area of the Cardigan Bay SAC (The Kaiser Box) to be opened to scallop dredging under this legislation. This was in line with WG adopting “the precautionary approach” under the Habitats regulation which heavily restricts the activity until such a time that any adverse effect to the site features could be ruled out.

The Kaiser Box is part of the fine scale survey area assessed by (Hinz et *al*., 2010a) and is approximately 9 x 4 nautical miles. The area is characterized by fields of mobile sand which showed distinct bedforms (sand waves), orientated perpendicular to the prevailing current (Hinz *et al*., 2010a). Overall the number of species present in the area was low, with an average of 7 species and a maximum of 15 species per tow. The overall conclusion of this study was that the area is a highly dynamic environment, with low species numbers and abundance of opportunistic benthic biota. Benthic organisms typical of established reef communities such as hydroids, soft corals and anemones were rare even within the boulder and cobble habitats within the site (Hinz *et al*., 2010a).

The study could not rule out that previous scallop dredging within the area had not caused the fauna to become impoverished. Hinz (*et al*., 2010a) therefore compared other similar habitats that are subject to scallop dredging (Lyme Bay) with a similar period of closure and recovery. The abundance and diversity of reef fauna was much higher at these sites, this led to the authors concluding that Cardigan Bay SAC experiences high levels of natural disturbance and that the benthic community in the area samples is impoverished through natural processes to a greater extent than fishing activities. These studies informed the Test of Likely Significant Effect (TLSE) to enable opening of the "Kaiser Box" under the Scallop Fishing (Wales) (No. 2) Order 2010, with the test concluding no significant effect on the site features of the SAC. The TLSE concluded that opening the "Kaiser Box" would not have a significant effect on the site features of Cardigan Bay SAC. Scallop dredging was therefore permitted under the Order from March – May 2010 in this area of the SAC.

The initial reports (Woolmer, 2009 and Hinz et al., 2010a) were updated with more detailed information and data and survey information surrounding the species and habitats of the SAC by Woolmer (2010) and Hinz (2010b). These studies informed subsequent years (to 2015) TLSE to enable opening of the "Kaiser Box" under the Scallop Fishing (Wales) (No. 2) Order 2010.

Following an additional complaint by the Whale and Dolphin Society, questioning the findings of the surveys and the evidence used in WG TLSE, these studies were peer reviewed by Dave Palmer from The Centre for Environment Fisheries and Aquaculture Science (CEFAS) (Palmer, 2011). The peer review was conducted prior to the commencement of the scallop fishery in Welsh waters November 2010-April 2011 in the open area (Kaiser Box). Palmer (2011) concluded that the evidence considered by the TLSE is sufficient to conclude that scallop dredging, controlled by the technical conservation measures in the Fishery Order, would not have a significant detrimental effect on the features for which the SAC was designated. With respect to the conclusions drawn by the complainants, Palmer (2011) found that the findings from both reports were sound, but did agree that some errors

were made and that the TLSE should have been more detailed, critically with respect to the levels of natural disturbance in Cardigan Bay. This was verified by Palmer (2011) who checked Aberporth Met Office MAWS (Met office Marine Automatic Weather Station) buoy data for wave heights in Cardigan Bay. Using a model that was under development by CEFAS which assessed seabed disturbance based on modeled wave and tide data, John Aldridge (stated in Palmer, 2011) states that "Cardigan Bay is subject to high levels of natural disturbance because it is "exposed to wave action and that the sediment is relatively coarse leading to relatively large wave generated bedforms that disturb the sediment down to at least 5cm (on sand)". Palmer (2011) notes that this adds further support to the findings of Hinz (2010 b), as mobile sediment, subject to high levels of natural disturbance, is inhabited by small-bodied organisms that are physically resilient to disturbance. Palmer (2011) also concluded that scallop dredging would not have an impact on potential prey sources of bottle nose dolphins. Bottle nose dolphins are opportunistic hunters and "thus they do not rely to any extent on one or two key prey species and are robust to changes in species composition" (Palmer, 2011). This conclusion was also the same with respect to prey species and grey seals.

1.2 Effects of Scallop Dredging on Seafloor Habitats

There were many references within the consultation responses that quoted from Kaiser *et al*., (2006) with respect to the negative impacts of towed bottom fishing gears and with this practice constituting one of the largest global anthropogenic sources of disturbance to the seabed and its biota (Kaiser *et al*., 2006). WG recognise this fact and are fully aware of the impacts that this type of gear can have. However, Kaiser *et al*., (2006) also conclude that the severity of the impact on the seabed varies greatly with habitat type and is also strongly habitat –specific. This was supported by the work of Howarth and Stewart (2014) whose report also states that the impacts of scallop dredging vary greatly between different seabed types and between different groups of organisms. Howarth and Stewart (2014) state that "although scallop fisheries are known to have negative impacts in almost all habitat types, some

are highly sensitive to disturbance while others are more resilient". Kaiser *et al*., (2006) conducted an analysis of 101 fishing impact manipulations, and found that scallop dredging had the most severe impact on biogenic habitats, such as Maerl (a filamentous algae composed of calcium carbonate) and Modiolus (horse mussel) reefs, both of which form distinctive biogenic habitats. This was also concluded by Howarth and Stewart (2014). With respect to species, slow growing large biomass biota such as sponges and soft corals took much longer to recover than biota with short life spans such as polychaetes. These larger biota are generally associated with habitats that are naturally more stable such as biogenic reefs. "It is therefore commonly thought that the effects of dredging will be relatively short-lived for ecological communities adapted to frequent natural disturbance by currents, tides, storms and re-suspension of sediments, such as those inhabiting soft mud/sand sediments" (Howarth and Stewart 2014).

In 2012 The Department of Food and Rural Affairs (DEFRA) took a revised approach to the way that England manages fishing activities within European Marine Sites (EMS). DEFRA, working with the Marine Management Organisation (MMO) developed a matrix that determined the impacts of different fishing gear on different habitats. The purpose of the matrix is to guide fisheries management in European Marine Sites. The matrix identified scallop dredging to be damaging to seagrass beds, maerl beds, chalk reefs, boulder reefs and *Sabellaria* (Honeycomb worms). The matrix may lead to scallop dredging being banned from these habitats. Welsh Government utilised this approach in the "Assessing Welsh Fishing Activities" project. Welsh Government commissioned an independent marine consultancy, ABPMer, to undertake the work and to build upon the work carried out by other administrations on fishing gear–feature interactions, tailoring the information to the Welsh context and incorporating new evidence sources.

The outputs of the project were to produce:

- A generic 'Welsh Matrix' which identifies the risk of each gear–feature interaction, and prioritises the interactions for further assessment, whilst maintaining a clear audit trail;

- An Evidence Database that compiles relevant evidence on the impacts of each gear–feature interaction; and
- Principles and Priorities document (Walmsley *et al*., 2016).

The matrix utilised a risk prioritisation process which allowed identification of fishery habitat/species interaction that are the most damaging and therefore allows the identification of which assessments should be carried out first, in a transparent and auditable manner (Walmsley *et al*., 2016). The matrix builds on the fisheries management measures that are already in place and prioritises assessments where fisheries interactions have not been addressed through existing legislation. Fishing has been ongoing for a number of years and a number of the activities that are likely to be most damaging on vulnerable features have already been assessed and are already managed, for example, through the Scallop Order 2010 and Mobile Gear Order 2013 (Walmsley *et al*., 2016). This adds further strength to the evidence and legislation surrounding scallop dredging within Cardigan Bay SAC and Welsh Ministers' approach to assessing the activity in line with Article 6 of the Habitats Regulations.

1.3 Evidence underpinning the Scallop Consultation

There were questions raised in consultation responses with respect to the evidence base underpinning the proposed new management measures for scallop dredging in Cardigan Bay SAC. The study undertaken by Bangor University (Lambert *et al*., 2015 a, b and c) built upon the previous work which assessed the offshore habitats of Cardigan Bay SAC (Hinz *et al*., 2010a and b).

The study was designed to investigate the geology of the seabed and the response of animal communities within the seabed to a range of scallop fishing intensities and was undertaken spring 2014 in an area of Cardigan Bay SAC that is closed to scallop dredging. The immediate effects were quantified, and subsequently monitored in the autumn and spring. 17 experimental boxes were set up, with 4 acting as controls where no fishing occurred, and the

remaining dredged at different sweep intensities, to a maximum intensity of 6.2 sweeps of a scallop dredge. A pre-experimental survey demonstrated that animal communities within each experimental box differed in relation to the sediment. The initial pre-fishing low density of infaunal (animals that live in the sediment) and epifaunal (animals that live on the sediment) species suggested that the seabed was an unstable, mobile substratum subject to period natural disturbance events (Lambert *et al*., 2015a). The main conclusions of the study were that there is a high level of change in species composition between areas and seasons, and the infaunal animals were different in sand than in gravel. Epifanual animals were equal in both substrates. The substrate in the experimental area of Cardigan Bay was highly variable and patchy. Scallop dredging left troughs in most of the fished areas on a range of sediments, however most dredging marks were no longer visible 10 months after fishing (Lambert *et al*., 2015a). There were some changes to species composition due to fishing, these changes increased with fishing intensity between March and May, and to a lesser extent between March and September. These changes were studied in more detail (see Lambert *et al*., 2015a, b and c) but any changes observed along the fishing gradient had disappeared by September. In sand habitats there was a continuous increase in epifaunal animals compared to control sites by September. However in gravel epifaunal abundance and biomass this had decreased in areas that had been fished over 3.5 - 4 times. This could partly be explained by some specific groups of species. The study found that "natural variation was of similar magnitude to fishing impact. Overall, by September, despite some remaining evidence of changes in abundance, the differences in species composition between control and fished plots were no longer detectable" (Lambert *et al*., 2015a).

This study supported the conclusions of Hinz *et al*., (2010 a and b) with respect to habitat variation within Cardigan Bay and additionally that the dynamic nature of Cardigan Bay show levels of disturbance similar to level generated by certain intensities of fishing activity. Among concerns raised by the consultation responses were the fact that the area where experimental fishing took place had already been subject to high historic fishing levels.

Claims that this would have altered the physical structure of the area years ago were also noted, and that the results of the study only relate to impact and recovery of the already damaged ecosystem. This is essentially the case; however scallop dredging has occurred within the area for many years and prior to the designation of the SAC. It therefore seems unreasonable for consultation responders to criticise the validity of the study with respect to this. This was the approach taken by Bradshaw *et al*., (1994), who began a programme of experimental dredging in an area in the Irish Sea that has been closed to scallop dredging for 5 years. Bradshaw *et al*., (1994) states that "A common problem with studying fishing disturbance is the lack of good control sites" that may have been altered in the past. Areas that are unfished may be very different to fished areas.

In response to questions concerning the scientific merit and approach of the (Lambert *et al*., 2015 a) study WG sought peer review of the full methodology, results and conclusions of the study by leading international specialists. These were Dr Ian Tuck from the University of Auckland New Zealand and Professor Kevin D.E Stokesbury, from the Department of Fisheries Oceanography, University of Massachusetts. Dr Tuck has a background in various shellfish fisheries, including within the ICES system, and leading scampi research, survey and assessment activities, as well as research experience investigating the effects of fishing on the seabed, and ecosystem indicators. Dr Tuck also leads the Fisheries Environmental Impacts Programme. Professor Stokesbury is responsible for developing fisheries programmes including work on ground fish, lobsters and scallops, with his principle interest including scallop stock assessment, rotational fisheries management strategies , gear development and environmental impacts.

Dr Tuck stated that given the localised nature and lack of high resolution fishing data, the scientific approach in the Lambert *et al*., (2015) study appears the most appropriate. Dr Tuck recognised that the study area had only been closed to fishing since 2009 and that this may not have been long enough for recovery of particularly slow growing species and may underestimate abundance, however Dr Tuck commented that "given the

locality (exposed coast) and that cobble reefs in the area were specifically excluded this is probably not an issue". The review discussed how the sampling and statistical approach used to assess the data was also appropriate, and that the results were presented in a clear and standardised way. The overall conclusion of the peer review by Dr Tuck was that "the overall quality of the evidence provided is high and the conclusions drawn are appropriate. The results are also consistent with studies elsewhere is similar habitats, giving further confidence that they can be used to inform policy".

The review by Professor Stokesbury stated that the Cardigan Bay Fishing Intensity Study is "of the Highest Scientific Merit", and agreed that the experiment is one of the most substantial scallop dredging experiments conducted in the UK and worldwide. Professor Stokesbury refers to Sullivan *et al*., (2006) and states that the project meets the criteria for "Best Available Science" for fisheries and environmental science policy and management. The review continues by evaluating the scientific approach and methodologies as being scientifically sound and well considered, and that the experimental design for the work was carefully laid out with sufficient samples for both infauna and epifauna. In the concluding remarks Professor Stokebury states that "the overall quality of the evidence from the experiment is excellent". The conclusions are carefully presented and discussed in context of the wider literature. The concluding remarks also state "I have not seen a better executed BACI (Before - After - Controlled – Impact) study. It meets the standards of "Best Available Science" and should be used to guide management and policy".

1.4 Interactions with Dolphins

There was concern raised within consultation responses as to the effects that Scallop Dredging is/will have on the semi-resident population of Bottlenose Dolphins, *Tursiops truncates*, in Cardigan Bay. Reference was given to Feingold and Evans (2014) which summarises the field research conducted by the Sea Watch Foundation in 2011-13 on behalf of Natural Resources Wales. The aims of the research were to provide information on the condition

of bottlenose dolphins and harbour porpoises in Cardigan Bay including both the Cardigan Bay and Pen Llyn a'r Sarnau Special Areas of Conservation (SACs) and offshore areas; to use photographic ID techniques to evaluate dolphin movements, distribution and abundance; to assess population structure; to gather evidence of anthropogenic activities within the site; and to assess supporting habitats (Feingold and Evans, 2014).

It was quoted within consultation responses that a high level of scallop dredging may have been responsible for low numbers of calves being sighted within the area following 2007 scallop fishing. There is no evidence to substantiate this and the study by Feingold and Evans (2014) itself states that peaks are seen in 2002, 2005 and 2011, and "very low numbers in 2008-09 may correspond to years of low survey effort". Official Marine Management Organisation (Patrick Wintz; MMO, *pers. comm*) Landing Statistics do show that effort in 2008 was highest within the 8 year period (2008-2015) (82 vessels) however peaks of calf rates in 2011 also occur during high levels of vessels activity (68) and there was also a high number of new born in 2010 (Feingold and Evans, 2014) when vessels numbers were also 68. The peak calving season in Cardigan Bay occurs between July and September when 76% of births occur, with the scallop fishery in contrast occurring throughout the winter months between November and April. There is no supporting evidence to suggest that scalloping would be detrimental to calving females, and Feingold and Evans (2014) state that it is not possible to say with any confidence whether scallop dredging is having an effect on the dolphin populations. There was no additional evidence provided in consultation responses to support that scallop dredging is having a direct detrimental effect on the dolphins within Cardigan Bay.

Sea Watch Foundation conduced a review of Scallop Dredging in Cardigan Bay on Bottlenose Dolphins in December 2015 (Website 1 Accessed 27/09/2016). The review states that dredging could have an impact if it causes more than temporary damage to the seabed and animal communities. There is no evidence cited in the review to support this. The website discuses the distribution of the dolphins and states that they are much higher in certain

areas particularly in the coastal zone around headlands and reefs, and within 3nm. However, they do occur offshore at least in 6nm. The population size of the bottlenose dolphins has changed over the last 15 years and since 2008 it has been generally declining across the whole of the bay. However numbers within the SAC itself appear to fluctuate. The review discusses that the changes did coincide with increased scallop dredging but cannot say if this is directly related. Additional factors such as natural changes in food availability or to the increasing evidence of disturbance related to the rise in recreational activities in the area (Evans, 2015) may cause related disturbance. Evans (2015) concludes by acknowledging that scallop dredging and dolphins can co–exist even within an SAC if potential negative impacts are investigated and minimised.

The third UK report under article 17 of the Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (January 2007 – December 2012) Conservation status assessment for Bottlenose Dolphin, concluded that UK populations were in favourable conservation status (Website 2). The report collates data over a large spatial scale using distributional data and expert judgement and gives reference to populations in Cardigan Bay, stating an overall increase in abundance since 2001. Paxton *et al*., (in press; cited in Website 2) states that there were no significant population changes in either the short or long term with animals being essentially coastal, with particular consistent regions of high density in Cardigan Bay (Please see website 2 for a detailed review).

1.5 Sediment Disturbance Associated with Pollution Levels

Reference was given within a consultation response to the effects that scallop dredging would have on the re-suspension of sediments contaminated with polychlorinated biphenyls (PCB's). PCB's are widely recognised as bio-accumulates and have a range of species-specific and dose–dependent toxic effects such as immunosuppression and reproductive impairment in all mammalian species (Jepson *et al*., 2016).

A recent study by Jepson (*et al*., 2016) investigated this continued issue on European Data from 1, 081 cetacean species, from meta data sets, stranded and dead and free-living biopsied marine mammals including bottle nosed dolphins. The results found that there were some locations where there were PCB hotspots, namely the western Mediterranean Sea and south-west Iberian Peninsula. There were quotations made from this study in consultation responses with respect to the levels of PCB exposure in bottle nose dolphins from Wales (91.81 mg/kg lipid). When consulting the tables within the document, these levels were lower in context to the amounts in bottle nose dolphins from other areas, with only samples from Ireland and Portugal being lower (46.87 and 85.73 respectively). The highest levels were found in bottle nose dolphins from the Strait of Gibraltar at 324.01 (mg/kg lipid). Jenson (2016, *pers comm*.) added a caveat to the UK data because the samples from the UK were from stranded animals only and the exact population and location that the animals came from could not be determined. The fully assesses PCB risk could therefore not be attributed to a specific Cardigan Bay population, and could only be fully assessed if the Cardigan Bay population were live biopsied.

Conclusion

The evidence reviewed within this document was an overview of best available data and evidence at time of preparation (September, 2016) that has been utilised by WG.

There has been no additional data and evidence submitted within consultation responses that may strengthen or alleviate concerns with regard to the proposals that were being consulted on.

Welsh Government is committed to utilising the best available evidence to underpin policy and management decisions, and all references contained within this document can be elaborated on if required.

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