

## A REVIEW OF INCIDENTAL CETACEAN BYCATCH REPORTING IN EU WATERS

Alex R. Hanke<sup>1</sup>, Laurence T. Kell<sup>2</sup>, and Caterina M. Fortuna<sup>3</sup>

### SUMMARY

*This review determines the state of cetacean bycatch reporting in EU waters as reflected in a 2019 European Union report. The objective was to determine the extent to which cetacean bycatch data and methods could inform the development of an indicator of ICCAT fisheries impacts on cetaceans. The report suggests the need for ICCAT to work with other RFMOs to jointly develop a sampling framework that will provide the data required to identify status indicators and thresholds that will allow risks to be managed. The experiences conveyed in the report also show the importance of coordination of efforts between scientists, managers and fishing entities.*

### RÉSUMÉ

*Cet examen détermine l'état de la déclaration des prises accessoires de cétacés dans les eaux de l'UE, comme indiqué dans un rapport de 2019 de l'Union européenne. L'objectif était de déterminer dans quelle mesure les données sur les prises accessoires de cétacés et les méthodes pourraient éclairer l'élaboration d'un indicateur des impacts des pêcheries de l'ICCAT sur les cétacés. Le rapport suggère la nécessité que l'ICCAT travaille avec d'autres ORGP pour développer conjointement un cadre d'échantillonnage qui fournira les données nécessaires pour identifier les indicateurs de l'état et les seuils qui permettront de gérer les risques. Les expériences présentées dans le rapport montrent également l'importance de la coordination des efforts entre scientifiques, gestionnaires et entités de pêche.*

### RESUMEN

*Esta revisión determina el estado de la captura fortuita de cetáceos declarada en aguas de la UE, tal y como aparece reflejada en un informe de la Unión Europea de 2019. El objetivo era determinar la medida en que los datos y métodos sobre captura fortuita de cetáceos podrían aportar información para el desarrollo de un indicador del impacto de las pesquerías de ICCAT sobre los cetáceos. El informe sugiere la necesidad de que ICCAT trabaje con otros OROP para desarrollar conjuntamente un marco de muestreo que aportará los datos requeridos para identificar los indicadores del estado y los límites que permitirán gestionar los riesgos. Las experiencias expresadas en el informe muestran también la importancia de la coordinación de esfuerzos entre científicos, gestores y entidades pesqueras.*

### KEYWORDS

*Ecosystem Report Card, Cetacean, bycatch, EBFM*

<sup>1</sup> St. Andrews Biological Station/ Biological Station, Fisheries and Oceans Canada, 531 Brandy Cove Road, St. Andrews New Brunswick E5B 2L9 Tel: +1 506 529 5912, Fax: +1 506 529 5862, Email: alex.hanke@dfo-mpo.gc.ca.

<sup>2</sup> Centre for Environmental Policy, Imperial College London, London, United Kingdom. Laurie@seaplusplus.co.uk

<sup>3</sup> National Institute for Environmental Protection and Research, Via Vitaliano Brancati 60, I-00144 Rome, Italy, caterina.fortuna@isprambiente.it

## 1. Introduction

The objective of this study is to evaluate the *Review of the implementation of the EU regulation on the incidental catches of cetaceans (STECF 2019)*, which contains the *Review of the implementation of the EU regulation on the incidental catches of cetaceans (EWG 19-07)*, and determine its usefulness in supporting the Subcommittee on Bycatch and Ecosystems' work on developing an ecosystem report card and implementing EBFM. The emphasis is on identifying data and methods to support the development of an indicator of ICCAT fisheries impacts on cetacean species.

The report (STECF 2019) pertains to the implementation and assessment of the effectiveness of a EU fishery regulation on cetacean bycatches and the report of the EWG 19-07, highlighted within, represents a review and commentary on issues associated with current legislation and the work undertaken to provide cetacean population estimates. It also considers incidental bycatch estimates, data and methods to provide such estimates, as well as bycatch mitigation methods. It draws on the work of the ICES WGBYC (ICES 2019), the ICES WKPETSAMP (ICES, 2018b) and the results of the FishPi project (<https://www.masts.ac.uk/research/fishpi-projects/>) and on an extensive list of published papers and reports. The EWG report focuses on cetaceans, but other Protected, Endangered and Threatened (PET) like seabirds or turtles are also mentioned.

## 2. Does the report provide a source of whale bycatch data?

The report provides a non-exhaustive list of evidence of known cetacean bycatch in EU waters (after SEC(2002)1134) provided in Table 6. Bycatch is identified to gear type, nation, location and bycatch species however the actual data is contained within the references identified. Table 13 summarizes interactions between cetacean and fisheries within the ACCOBAMS area. The areas (Geographical Statistic Area, GSA) are those adopted by GFCM (<http://www.fao.org/gfcm/data/maps/gsas/en>). Interactions include bycatch and depredation by species, gear type and country but counts are not annualized. Additionally, the document *Review of Bycatch Rates of Cetaceans in the Mediterranean and the Black Sea (ACCOBAMS, 2019)* contains tables which provide references and the reported catch per unit effort (CPUE), mortality rate and estimated annual number of cetaceans caught by GSA, period, species and gear .

Additionally, it is also noted that in 2019 the ICES WGBYC summarised the species bycaught per year in the observed métiers and ICES ecoregions along with the observed days at sea and total fishing effort. The available data provides an indication of the range of bycatch rates for various taxa by gear and ecoregion. Bycatches of marine mammals are observed in all ecoregions in set nets, purse seines, rod-and-pole, and trawl gears.

Interestingly, ICCAT was suggested as a source of cetacean bycatch data: ICCAT, 2011. Recommendation by ICCAT on information collection and harmonization of data on bycatch and discards in ICCAT fisheries (Rec. 2010-11:1-2). It was noted that ICCAT cetacean bycatch data collected through mandatory observer programs are currently not included in the Data Collection Framework but are supposed to be and that the ICCAT Regional Observer program, directly managed by ICCAT for compliance purposes and fully covering some Bluefin tuna activities, do not include any provision for reporting cetacean bycatch. It was apparently not clear to the authors of the ICES report that the ICCAT reports of cetacean bycatch are unlikely to fill any of the existing gaps.

The report recognizes that current monitoring and reporting of cetacean bycatch is inadequate and that full implementation of monitoring of incidental catches will take time. Also there is a lack of monitoring of fisheries that pose the greatest risk. Given a paucity of cetacean bycatch data it is important to consider what measures are in place or contemplated to rectify the problem. It was noted that only a limited number of countries have implemented dedicated monitoring programmes for protected species. Most countries fulfil their requirements under Regulation (EU) 812/2004 through combined monitoring within the Data Collection Framework (DCF)., However, despite the DCF observed days exceeding dedicated observed days in all fishing grounds, this did not lead to improved recording of the bycatch of cetaceans. DCF monitoring programme coverage is extremely low, and for cetacean species with very low bycatch rates, monitoring efforts would need 50-100% coverage to obtain precise estimates (CV<30%). Consequently proposals to use video monitoring to increase coverage and reporting are being considered.

While articles 4 and 5 under Regulation (EU) 812/2004 require Member States to ‘*design and implement monitoring schemes for incidental catches of cetaceans using observers on board the vessels flying their flag [...]*’ under certain conditions, compliance issues have arisen. The overall aim of this monitoring scheme was to provide representative data of the fisheries concerned. However, the quality and scope of the information provided by the reports has been variable, with some Member States simply repeating the information provided in previous years. Many Member States do not use the reporting template and summarise data at their own discretion, which makes using the information difficult.

A specific requirement of the Regulation is for general monitoring schemes to be based on a sampling strategy designed to allow the estimation of bycatch rates of those cetacean species, most frequently bycaught (per unit effort by a given fleet) to achieve a Coefficient of Variation (CV) not exceeding 0.30. It was noted that this directive is not easy to achieve for species with low bycatch rates.

Regulation (EU) 812/2004 has been repealed and replaced with similar measures embedded into a wider framework targeting fishery target species catch rates (i.e. Regulation (EU) 2019/1241 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures). This new Regulation has the same issues identified for Regulation (EU) 812/2004.

### **3. How comprehensive is the reporting (flags, gears, years, areas, species)?**

Bycatch is identified to gear type, nation, location and bycatch species however, as indicated above, the actual data is contained within the references identified.

The report identifies a number of gaps such as for the majority of vessels with an overall length of 10 meters or less there is no information available on fishing effort, such as days at sea or soak time. It is therefore challenging to assess the impact of bycatch on cetaceans, along with designing where to monitor incidental catches, if area specific fishing effort data are lacking. Similarly, it was noted that regulations put emphasis on vessels over 15m which, because of the relationship between gear type and vessel size, resulted in inadequate monitoring of gear types that pose the greatest risk to cetacean species (e.g. set nets by vessels <15 m in the Baltic Sea). A final consideration with respect to effort data is that though there are common standards of recording fishing effort across Member States and in central databases (e.g. the ICES Regional Database [RDB]) these do not have a unit of effort that is compatible with the bycatch monitoring data. Fishing effort for small vessels (<12 m) is particularly challenging to obtain accurate estimates of and Member States have different ways of generating the effort data which creates challenges in using it collectively.

Additionally, sampling of the gear types has been problematic. Generally, bottom trawling is oversampled with respect to monitoring of protected species bycatch, while in most fishing areas, set nets, longlines, and purse seines are under-sampled. In the Mediterranean, Regulation 812/2004 provisions were only to monitor pelagic trawlers (and gillnets), which are known to be the least impacting gear. Contrary to scientific advice, gillnets were excluded from the regulation for this region. As a result, very little is known about gillnet fishing effort or cetacean bycatch in the Mediterranean even though there is evidence of impacts by these other gears. For example, it was observed that although no bycatch of mammals was reported by the Greek Data Collection Programme in 2018, there was evidence of mortality due to cetacean bycatch related strandings of 10-20 % from 2016-2019.

Spatially there are enormous gaps in monitoring of fisheries causing potential bycatch of cetacean species in the Mediterranean Sea, the Black Sea and the European Macaronesia. The report noted that the scarce availability of data does not allow for a reliable risk assessment of the various gear types concerned, therefore preventing any potential mitigation action in these Regional Seas. Also, it identified two major difficulties to implementing optimal sampling designs: (1) generating suitable samples (this is constrained by factors such as unwilling skippers or owners, no legal obligation to carry observers, insufficient space for observers, health and safety issues with vessels), and; (2) a lack of funding for sufficient sampling to allow detection and extrapolation to suitable spatial scales.

#### 4. Are BPUE estimates provided?

It is evident that BPUE estimates are rarely available for cetaceans irrespective of gear, spatial and temporal considerations. The report emphasizes that in order to estimate current bycatch rates, a proven, efficient and well-designed monitoring scheme must be implemented, which is designed to either estimate incidental mortality within an acceptable confidence interval, or alternatively to detect any transgression of a specified target level with an acceptable statistical power. It further states that where reliable bycatch estimates or biological parameters are not available to robustly calculate the level of bycatch and assess against a threshold, high-risk situations can still be identified, for example through the Bycatch Risk Assessments (BRA) approach, where there is an overlap of: a) fishing effort with a population with unknown status or that is clearly at a historical low level (e.g., Iberian harbour porpoise); b) a species distribution with a fishery which is known to cause 'significant' incidental mortalities (e.g. gillnets and Baltic harbour porpoise).

The report mentions BRAs conducted using the ICES WGBYC database, which holds data on fishing effort and bycatch information submitted by Member States that are subject to Regulation (EU) 812/2004. An input to a BRA is BPUE. In recent years, there has been a BRA analysis conducted for harbour porpoise in the Kattegat and Belt Sea in static nets in 2015; in the Celtic Sea in static nets in 2016, in the Celtic Sea in static nets and bottom trawls in 2017 and in static nets in the North Sea and for common dolphins in the Celtic Sea (CS) and Bay of Biscay in midwater trawl and static nets in 2017. However, as the ICES WGBYC stressed, the bycatch estimates are likely biased due to limitations in both the bycatch data as well as reliability of the fishing effort data.

#### 5. Is a state indicator identified along with thresholds?

The report recognizes that there are no reliable cetacean population estimates for many species and no reliable estimates of incidental catches because of inadequate monitoring in EU waters. Consequently there is no objective scientific basis with which to propose reliable estimates for maximum potential bycatch thresholds for all the cetacean species most typically bycaught (i.e. harbour porpoises, common, striped and bottlenose dolphins and humpback whales). Guidance on setting thresholds in the absence of stock status was provided by the Scientific Committee of the International Whaling Commission (IWC) which agreed that, in the absence of any detailed information on stock status, an estimated annual bycatch of 1% of the estimated population size would indicate that further research should be undertaken immediately to clarify the status of the stocks (Anon, 1996). Furthermore, it was agreed that an estimated annual bycatch of 2% of the estimated population size may cause the population to decline and requires immediate action to reduce bycatch. In addition to the rule of thumb approach for estimating maximum bycatch thresholds, the suggested methods were: 1) a rule of thumb 1.0% of best population estimate, 2) potential biological removal, 3) ASCOBANS 1.7% of best population estimate<sup>4</sup>, 4) Catch Limit Algorithm (CLA), 5) Removal Limit Algorithm (RLA) and 6) population viability analysis. Further guidance for developing thresholds recommends that they are:

1. Consistent with Union legislations;
2. At appropriate geographic scales of assessment to reflect the different biotic and abiotic characteristics of the regions, subregions and subdivisions;
3. Set on the basis of the precautionary principle, reflecting the potential risks to the marine environment;
4. Make use of the best available science;
5. Based on long time-series data, where available, to help determine the most appropriate value.

It is properly noted that any existing tool for estimating "maximum bycatch thresholds" requires the definition and quantification of conservation or management objectives that have been agreed upon by both scientists and managers. These objectives will influence the final output of a threshold-setting process in a quantitative manner and, therefore, need to be fully defined at the outset. A summary of candidate maximum bycatch thresholds for most commonly caught species is provided in Table 5 of the EWG 19-07 report along with methods for estimating them. It appears that there is no universal method and that the threshold estimates depend on the method, objectives and temporal window selected. Section 4.3 of EWG 19-07 provides information on available data and gaps for estimating bycatch thresholds.

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<sup>4</sup> This was generated by a modeling exercise based on population dynamics of harbor porpoises made by the IWC and has subsequently been applied to all cetaceans. The CLA would give much smaller percentages.

Another approach that was recommended by the ICES WGBYC is a Bycatch Risk Assessment (BRA). It was considered to be a straightforward approach that can be used to obtain provisional indications of potential risks in “data poor” cases [4-6]. The concept is that given a species abundance estimate and/or bycatch rates, as well as an estimate of total fishing effort, ‘one can ask what overall bycatch rate would be needed to exceed the bycatch reference limit’ and then evaluate the likelihood that such limit is exceeded or if the assumed population can sustain such levels of bycatch. It is further noted that if all uncertainty is well described and understood, then the BRA constitutes a very useful exploratory tool that can flag potentially unsustainable cases and help prioritise research and management actions. In addition, the report recognized that BRAs could be employed to identify high-risk fisheries but also noted that, due to limitations of both bycatch monitoring data and fisheries effort data (described above), the bycatch estimates on which they rely are biased. Reference was made to the FishPi project (<https://www.masts.ac.uk/research/fishpi-projects/>) which provides risk classifications of different species by sea area. A proposed schedule for Bycatch Risk Assessments was every 2-3 years.

## **6. Are management actions identified?**

Acoustic Deterrent Devices (ADDs) are the only prescribed mitigation measure in the EU Regulation. Other suggested measures could include temporal closures of an area for a fishery with a known high bycatch rate and/or gear modification. Article 12 of the Regulation (EU) 1380/2013 states that a fishery can be closed provided there is scientific evidence available to show that there is excessive bycatch in an area.

The report also reviewed measures implemented in the U.S. to reduce the impact of fisheries on cetaceans. The U.S. framework to tackle the fishery bycatch issue includes the use of PBR (see also Sections §2 and 3) as a component of its Marine Mammal Take Reduction Plans (TRP) which are developed and implemented through Take Reduction Teams. The TRP also includes the need for annual or 3-yearly Stock Assessment Reports and associated monitoring. Take reduction teams develop take reduction plans to help recover and prevent the depletion of strategic marine mammal stocks that interact with identified fisheries by putting in place measures to reduce take below identified PBR thresholds. The immediate goal of take reduction plans is to reduce, within six months of their implementation, the incidental mortality or serious injury of marine mammals from commercial fishing to less than the PBR level. The long-term goal is to reduce, within five years of their implementation, the incidental mortality and serious injury mortality of marine mammals from commercial fishing operations to insignificant levels, approaching a zero mortality and serious injury rate, taking into account the economics of the fishery, the availability of existing technology, and existing state or regional fishery management plans.

## **7. Indicator validation**

There was no reporting on the topic of indicator validation.

## **8. Are mortality estimates provided?**

No mortality estimates are provided through the references contained in the non-exhaustive list of evidence of known cetacean bycatch in EU waters (after SEC (2002)1134) provided in Table 6 may contain this information.

## **9. Mitigation measures**

The report provides technical specs for acoustic deterrents, mitigation measures, maximum bycatch limits and an overview of where maximum thresholds have been applied. As indicated above, ADDs are the only prescribed mitigation measure in the EU Regulation. A review of the effectiveness of the measure indicates that it is only effective on harbor porpoise and in general implementation is low. Unfortunately it is described as also being used in areas where bycatch is low and has the unanticipated side effect of increasing depredation by and bycatch of seals which are attracted by the devices. The pingers also negatively impact porpoise by excluding them from their habitat.

The report observes that the implementation of ADDs when prescribed was not consistent and that a lack of compliance affects the ability to review the effectiveness of this particular measure. Other notable issues were that ADDs, when installed and used, were not maintained and that the measure applied to only a relatively small proportion of the European fleet comprised of vessels with an overall length of 12 metres or above. Consequently, only a very small proportion of all set gillnets need comply with the Regulation and are equipped with pingers. Thus, protection for porpoise, which are at high risk to set gillnets, is minimal.

An additional issue recognized in the report is the ability of harvesters to circumvent the Regulation. For example, Annex I of Regulation (EU) 812/2004 indicates that the use of acoustic deterrent devices is mandatory for ICES subarea 4 and Division 3a, however, pingers are not required for gillnets >400 m in length or on gillnets deployed in these locations from 1 November through to 31 July. Consequently, fishers circumvent the regulation by extending the total length of the nets (e.g. by linking two or more together). Interestingly, this particular regulation relaxes the requirement that pingers be used throughout the whole year even though harbour porpoise are present in the areas year-round. In the Baltic Sea, an area listed as requiring pingers, the regulation completely misses the summer distribution range of the critically endangered Baltic Sea harbour porpoise population.

## 10. Discussion

The *Review of the implementation of the EU regulation on the incidental catches of cetaceans* (Regulation 812/2004, repealed in 2019 and absorbed by Regulation 2019/1241) summarizes the current state of cetacean bycatch assessments within the EU. Specifically it reports on a regulation to reduce cetacean bycatch and the effectiveness of current regulations and mitigation measures. As such, the report provides information of relevance to the Subcommittee on Bycatch and Ecosystems' efforts to characterize the impact of ICCAT fisheries on cetaceans and other bycatch species. In particular the report:

- 1) Provides a non exhaustive list of evidence of cetacean bycatch in EU waters and ACCOBAMS areas and recognizes that ICES summarizes its information on cetacean bycatch within its ecoregions.
- 2) Indicates that the degree of disaggregation available in the data is by gear type, nation, location and bycatch species. It also notes the gaps in monitoring and reporting that result from how the regulations relate to vessel size (no monitoring for vessels under 12 meters). There also needs to be a common standard for reporting fishing effort across nations and more sampling of gears representing the greatest risk.
- 3) Notes that BPUE estimates are rarely available for cetacean species let alone by gear, spatial and temporal units. In the absence of a BPUE indicator time series, assessments are based on Bycatch Risk Assessments but the BPUE estimates and effort data on which they are based are considered biased.
- 4) Observes that, at present, there is no objective scientific basis with which to propose reliable estimates for maximum potential bycatch thresholds for all the cetacean species most typically bycaught (i.e. harbour porpoises, common, striped and bottlenose dolphins and humpback whales). However, alternative data poor methods for setting thresholds on bycatch in the absence of stock status are provided. Among them is the ICES recommended Bycatch risk Assessment, which constitutes a very useful exploratory tool that can flag potentially unsustainable cases and help prioritise research and management actions.
- 5) Identifies the use of acoustic deterrents as a mitigation measure and increased monitoring as management actions but also mentions that time area closure and gear modifications could be implemented provided there was sufficient scientific evidence on which to take action.
- 6) Demonstrates the failure of recommendations to implement mitigation measures for species requiring them because of exceptions due to vessel size, gear details or area and season. It also demonstrates the negative impacts that can result when proper consideration is not given to potential side effects.

The difficulty in obtaining bycatch data with which to monitor cetacean species or conduct risk assessments described in the report mirrors the experience in ICCAT. Consequently, collaborations with other RFMOs appears unlikely to yield the data that is required, rather it is through collaborations that it may be possible to design a comprehensive cetacean bycatch monitoring and sampling framework will provide the required data. It is also evident that these collaborations need to involve a dialogue of scientists and managers in order that measures and recommendation contemplated support the sampling, monitoring and mitigation efforts. Lastly, complete support and compliance of fishing entities is required in order that the recommendations are implemented by design and yield good data

## References

- ACCOBAMS, 2019. Review of Bycatch Rates of Cetaceans in the Mediterranean and the Black Sea. 5 - 8 November 2019, Istanbul, Republic of Turkey. ACCOBAMS-MOP7/2019/Doc 29, 22 pp.
- ICES, 2018a. Report from the Working Group on Bycatch of Protected Species (WGBYC 2018), 1–4 May 2018, Reykjavik, Iceland. ICES CM 2018/ACOM:25, 128 pp.
- ICES, 2018b. Joint WGBYC-WGCATCH Workshop on sampling of bycatch and PET species (WKPETSAMP) 24–26 April 2018 SLU Aqua, Lysekil, Sweden
- ICES, 2019. Report from the Working Group on Bycatch of Protected Species (WGBYC). International Council for the Exploration of the Sea (ICES). ICES Scientific Report, No. 51, Vol. 1 <https://doi.org/10.17895/ices.pub.5563>
- Scientific, Technical and Economic Committee for Fisheries (STECF) – Review of the implementation of the EU regulation on the incidental catches of cetaceans (STECF-19-07). Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-11228-0, doi:10.2760/64091 JRC117515.
- Selected References Related to Cetacean Bycatch in the ICCAT Convention Area**
- Barbosa-Filho, M. L. V., Barreto, R. M. F., Siciliano, S., Seminara, C. I., Costa-Neto, E. M. 2018. Use of Cetaceans as Bait in Southern Bahia, Brazil, by expert fishermen that market shark fins: a lucrative trade and two threatened zoological groups. *Ethnobiol. Lett.* 9, 12–18. doi: 10.14237/ebl.9.2.2018.953
- Barbosa-Filho, M., Costa-Neto, E., Danilewicz, D. 2016. Dolphin harpooning off the coast of Bahia, Brazil. *Mar. Biodivers. Rec.* 9:42. doi: 10.1186/s41200-016-0046-1
- Birkun, A., Northridge, S.P., Willstead, E.A., James, F.A., Kilgour, C., Lander, M., Fitzgerald, G.D., 2014. Studies for Carrying Out the Common Fisheries Policy: Adverse Fisheries Impacts on Cetacean Populations in the Black Sea. Final report to the European Commission, Brussels, 347 pp.
- Cucknell, A.C., Frantzis, A., Boisseau, O., Romagosa, M., Ryan, C., Tonay, A.M., Alexiadou, P., Öztürk, A.A., Moscrop, A., 2016. Harbour porpoises in the Aegean Sea, Eastern Mediterranean: the species' presence confirmed. *Mar Biodivers Rec*, 9: 72.
- CODA, 2009. Cetacean Offshore Distribution and Abundance (CODA) report. Available online at: [https://www.npws.ie/sites/default/files/publications/pdf/Anon\\_2009\\_CODA\\_Final\\_Report.pdf](https://www.npws.ie/sites/default/files/publications/pdf/Anon_2009_CODA_Final_Report.pdf), 43 pp.
- Flores, P. A. C., Trujillo, F., Rocha-Campos, C. C., Marini-Filho, O. J., Da Silva, V. M. F., Martin, A. R., Bolaños, J. 2008. The Status of “Piracatinga” Fishery using Amazon *Botos* As Bait in South America. *IWC SC/60/SM17*, 2pp.
- ICES, 2015. Report of the Working Group on Bycatch of Protected Species (WGBYC 2015), 2-6 February 2015, ICES Headquarters, Copenhagen, Denmark. ICES CM 2015\ACOM:26, 82pp.
- ICES, 2016. Working Group on Bycatch of Protected Species (WGBYC 2016), 1–5 February 2016, ICES HQ, Copenhagen, Denmark. ICES CM 2016/ACOM:27, 82 pp.
- Meirelles, A.C.O., Monteiro-Neto, C., Martins, A.M.A., Costa, A. F., Barros, H., Alves, M.D.O. 2009. Cetacean strandings on the coast of Ceará, north-eastern Brazil (1992-2005). *J. Mar. Biol. Assoc.* 89:1083–1090. doi: 10.1017/S0025315409002215.
- NAMMCO, IMR, 2019. North Atlantic Marine Mammal Commission and the Norwegian Institute of Marine Research. Report of Joint IMR/NAMMCO International Workshop on the Status of Harbour Porpoises in the North Atlantic. Tromsø, Norway.
- Northridge, S., Cargill, A., Coram, A., Mandleberg, L., Calderan, S., Reid, B., 2010. Entanglement of minke whales in Scottish waters; an investigation into occurrence, causes and mitigation. Contract report for the Scottish Government. Available at: <http://www.smru.st-and.ac.uk/documents/347.pdf>

- Ofori-Danson, P. K., Self-Sullivan, C., Mombu, V. M., Yelibora, M. A. 2008. Enhancing Conservation of the West African Manatee in Ghana (20pp). Annual Report 2007. Nature Conservation Research Centre, Accra, 45.
- Ofori-Danson, P., Debrah, J., Van Waerebeek, K. 2019. The status and trends of small cetacean landings at Dixcove artisanal fishing port, western Ghana. PeerJ Preprints, <https://doi.org/10.7287/peerj.preprints.27749v1>, CC BY 4.0 Open Access.
- Revuelta, O., Domènech, N., Fraija-Fernández, N., Gozalbes, P., Novillo, O., Penadés-Suay, J., Tomás, J., 2018. Interaction between bottlenose dolphins (*Tursiops truncatus*) and artisanal fisheries in the Valencia region (Spanish Mediterranean Sea). *Ocean Cost Manage* 165, 117-125 doi:10.1016/j.ocecoaman.2018.08.001.
- Ryan, C., Leaper, R., Evans, P.G.H., Dyke, K., Robinson, K.P., Haskins, G.N., Calderan, S., Van Geel, N., Harries, O., Froud, K., Brownlow, A., Jack, A., 2016. Entanglement: an emerging threat to humpback whales in Scottish waters. Paper SC/66b/HIM/01 submitted to the International Whaling Commission Scientific Committee.
- SCANS-II, 2006. Small cetaceans in the European Atlantic and North Sea (SCANS-II). LIFE04NAT/GB/000245 Final report, 54 pp.
- Snape, R.T.E., Broderick, A.C., Çiçek, B.A., Fuller, W.J., Tregenza, N., Witt, M.J., Godley, B.J., 2018. Conflict between dolphins and a data-scarce fishery of the European Union. *Human Ecol* doi:10.1007%2Fs10745-018-9989-7.
- Van Bresse, M.F., Burville, B., Sharpe, M., Berggren, P., 2018. Visual health assessment of white-beaked dolphins off the coast of Northumberland, North Sea, using underwater photography. *Marine Mammal Science* DOI: 10.1111/mms.12501.
- Van der Hoop, J.M., Moore, M.J., Barco, S.G., Cole, T.V., Daoust, P.Y., Henry, A.G., McAlpine, D.F., McLellan, W.A., Wimmer, T., Solow, A.R., 2013. Assessment of management to mitigate anthropogenic effects on large whales. *Conserv Biol*, 27(1), 121-133.
- Van Waerebeek, K., Debrah, J., Ofori-Danson, P. K. 2014. Cetacean landings at the fisheries port of Dixcove, Ghana in 2013-14: a preliminary appraisal. IWC Scientific Committee Annual Meeting, SC65B, Slovenia, May 2014. SC/65b/SM17. 4pp.
- Van Waerebeek, K., Ofori-Danson, P. K., Debrah, J., Collins, T., Djiba, A., Samba Ould Bilal, A. 2016. On the status of the common bottlenose dolphin *Tursiops truncatus* in western Africa, with emphasis on fisheries interactions, 1947-2015. Document SC/66b/SM19 Presented to the International Whaling Commission, Bled, 19pp.
- Van Waerebeek, K., Uwagbae, M., Segniagbeto, G., Bamy, I.L., Ayissi, I. 2015. New records of Atlantic humpback dolphin in Guinea, Nigeria, Cameroon and Togo underscore fisheries pressure and generalised marine bushmeat demand. 17pp. bioRxiv preprint first posted online Dec. 27, 2015; doi: <http://dx.doi.org/10.1101/035337>.