

What could be the bycatch of the recreational fishing in France in comparison of the commercial fishing in the English Channel area?

Y. Morizur ^(a), S. Hassani ^(b), O Van canneyt ^(c)

(a) IFREMER, centre de Bretagne, 29280 Plouzané

(b) Laboratoire des mammifères marins, Oceanopolis, 20200 Brest

(c) CRMM, Université de La Rochelle – CNRS, 17000 La Rochelle

Introduction

Does the recreational fishing in France have some bycatch of marine mammals? The answer is yes as harbour porpoise bycatch is reported sometimes by recreational fishermen in France. However the amount of bycatch is not easy to assess for that fishing activity. There is no licensing in the recreational fishing at sea in France. In this opened access system, there is however a regulation limiting the quantity and size of nets and no more than one net of 50 meters length with 2 meter height per boat is allowed for North sea, English Channel and Atlantic sea ¹; fishing can also occur on beaches under some conditions but a special authorization is required.

In this context, there is no exhaustive inventory of recreational fishermen in France. And the only known population that can be used for construction of representative samples is the total population in France-(metropole) which is regularly assessed by INSEE.

In 2006, Ifremer has managed an ad-hoc study on recreational fishing by using interviews in the French population (Ifremer, 2009)². This paper intends to re-use the data base to estimate what could be the total length of nets used in the recreational fishing in order to be compared to the professional fishing.

Material and methods

English Channel and North Sea limits

For this study the ICES limit were used. The western English Channel is the area VIIe and the eastern English Channel is the ICES area VIId. The North Sea area in this study is mainly the area IVc which is the fishing area of some commercial netters.

Recreational fishing

Structure of sampling

¹ Décret n°90-618 du 11 juillet 1990 relatif à l'exercice de la pêche maritime de loisir

² Ifremer, 2009. Synthèse des résultats finaux de l'enquête Ifremer sur la pêche de loisir. Rapport DPMA-Ifremer, avril 2009. <http://agriculture.gouv.fr/littoral-la-peche-de-loisir-a-la> ; [Synthèse des résultats finaux de l'enquête Ifremer sur la pêche de loisir en mer - avril 2009 \(PDF - 687.1 ko\)](#)

As there is no licensing in recreational fishing in France, the population of recreational fishermen is unknown.

The known population of households in France (metropole) is used for sampling while considering household as a statistical unit. This population is equal to 25 600 000 according to INSEE. Inside each sampled household, a random sampling of fishermen was done. This ad-hoc study does not use the OMNIBUS method traditionally used to sample with interviews inside the population.

Interviews

Enquiries were about fishing during the period of year 2006 and/or during the full year 2005. The structure of interview is presented in the Appendix 1.

A total of 15 085 interviews of households was achieved in 5 waves during the complete year 2006. The ratio between population and sample gives the raising factor which can be used for any extrapolation.

The choice of oversampling and corrections needed

To improve the quality of data, an oversampling on coastal areas was voluntarily done; such sampling method implies that the raw results have to be corrected as we need a representative sample of the population of reference. So four types of corrections were used: a geographical correction (to give to the seaside its true weight of 22.4 %), a socio-demographical correction (to be the exact socio-demographic image of the French households), a random sampling correction (to take into account the number of fishermen in side households), and a last fishing day correction (to be the image of the whole year through seasons, sea sides and types of fishing). To get the best correction, an iterative proportional fitting was used by using the generalized raking procedure (Macro CALMAR). This method permits to reduce the sampling variation and also the bias due to some non answers.

Cost of the survey

All this work was done with the BVA French society which is specialized in opinion poll and surveys by interviews. The cost of the survey was around 90 k€ for 15 000 interviews with including the data exploitation. The methodology was presented at the ICES annual Working Group WGRFS (ICES, 2012)³.

Length of nets

In this study, we have considered that the length of the nets used was the length allowed by the regulation: one net of 50 meters length per boat for North Sea & English Channel .

Commercial fishing

The estimate of quantity of nets is achieved by using the number of vessels multiplied by the length set at sea by one vessel. Two types of vessels were considered: the full time netters and the part

³ ICES, 2012. Report of the Working Group on Recreational Fisheries Surveys (WGRFS), 7-11 may 2012. ICES CM 2012 / ACOM:23

time netters. As the length may varied in each fishery an average length by vessel was used for each fishery and for each fleet.

Number of vessels

The information concerning the description of fleets from the ports of the English Channel are taken from an Ifremer study⁴ concerning the year 2008. The target fish are mainly sole +gadoids in eastern Channel, and monkfish in western Channel. As the vessels coming from ports of the external part of the Channel are not numerous, the vessels which were fishing in the Channel can be considered corresponding to the fleets located in the ports of the Channel. A total of 174 full time vessels was registered as netters in the ports of North sea–English Channel in the year 2010. Most of the vessels are in the length class of 8-12m. According to the same Ifremer study there were also a fleet of 187 vessels working part-time as netters “polyvalents dormants“ by working 7 months per year with nets. The main target species are sole and rays for this vessel fleet of 7-9 m length.

Length of nets

The lengths of nets used by fishery are taken from Morizur & Carn (2000). The average size of length of nets at sea in the fisheries is 15 km for sole, 10 km for gadoids, 45 km for monkfish & rays⁵. The difference between the fisheries is mainly due to the soak times.

Available estimates of bycatch

Some annual estimates exist on bycatch of commercial nets exist for the English channel and North sea through the previous study of FilManCet followed with the study of Obsmer which objective is to continue the observation on all sizes of fishing vessels using set nets in order to complement the 812/2004 regulation and to bring requested information for the ASCOBANS Conservation Plan for Harbour porpoises (*Phocoena phocoena* L.) in the North Sea. The annual bycatch estimate issued from the French project FilManCet was 180 [1;521]animals for ICES area IV (North sea) and 80 [4;242] for area VIIe (western Channel); no bycatch was observed in the fishing days sampled for area VIId between November 2008 and October 2010.

Harbour porpoise abundance versus depth and season

In the North Sea-Eastern Channel, the study Filmancet provided some information on the distribution of harbour porpoises during the year 2011 (ASCOBANS/AC17doc4-16.). For the Western Channel, the Pingloise study (Stephan & Hassani, 2009)⁶ and the Filmancet study provided also observations on the distribution of cetaceans in French coastal areas for the year 2009-2010. More recently, the project SAMM was achieved in order to study the abundance of cetacean species in all the English Channel and south of North Sea in the year 2012. Two reports (Pettex et al., 2002; Pattex et al.,

⁴ Leblond E. et al. (2010). *Synthèse des flottilles de pêche 2008 - Flotte Mer du Nord - Manche - Atlantique - Méditerranée*. <http://archimer.ifremer.fr/doc/00003/11456/> /

⁵ Morizur Y. & Carn N. Contribution à l'évaluation des puissances de pêche des fileyeurs français. Etude DGXIV-c-1/97/033 ; rapport final, nov 2000, 84 p. <http://archimer.ifremer.fr/doc/00000/1243/>

⁶ Stephan E. & Hassani S, 2009. Etude pilote « PINGIROISE » ; Volet n° 3 : Distribution et abondance des petits cétacés en mer d'Iroise ; Rapport final, Juillet 2009, Laboratoire d'Etude des Mammifères Marins, OCEANOPOLIS, Brest, France.

2013)⁷ are issued from the aerial survey and they deal respectively with the winter season (year 2011-2012) and the 2012 summer season.

Results

The number of recreational fishermen using nets in the sample

Fishing during the year 2005

A total of 23 individuals was identified as having fished with nets (Atlantic = 10; Channel = 9; Mediterranean sea = 2). Only 9 individuals have used a boat to fish during the year 2005.

The last fishing day during the period of the year 2006

Some questions concerned the period of the last period of the year of enquiries (year 2006). 27 individuals have answered that they have fished with net during the last fishing day. This number represents 6% of the fishermen. They can be separated by areas (44% Atlantic; 41 % Channel; 15 % Mediterranean). Nine individuals were fishing with boats during the year 2006.

The number of fishermen using nets in the French population

The ratio between our sample and the households population in "France métropolitaine" indicates a raising factor of 1706.

A sample of 9 individuals gives a population of 15350 fishermen in France using nets with boats.

Around 40 % in the English Channel gives 6150 fishermen with net & boat in the Channel.

The assessment of quantity of nets used by the recreational fishing

One net of 50 meters length each gives 307 km of nets used with boats in the Channel when considering the whole population of fishermen. This amount is a maximal quantity of nets used in the English Channel by assuming that all the nets were immersed at the same time.

Comparison with professional fishing

For the full time fleet, the quantity of nets gives roughly 2600 km which can be at sea at the same time by using the average individual length individual corresponding to the fisheries. For the part-time netters "polyvalents dormants", the amount of nets is $5 \text{ km} * 187 \text{ nav} = 935 \text{ km}$ at sea during a part of the year. The total amount of commercial vessels in the English Channel and North Sea has a maximum value which is obtained when all the nets are considered as immersed at the same time. This maximum is around 3600 km and it corresponds to an instantaneous value.

⁷ Pettex C., Stephan E., David L., Falchetto H., Levesque E., Dorémus G., Van Canneyt O., Sterckeman O., Bretagnolle V., Ridoux V., 2012. Suivi aérien de la Mégafaune marine dans la ZEE et la ZPE de France métropolitaine, SAMM hiver 2011-2012 rapport de campagne ; Agence des Aires Marines Protégées.

Pettex C., Stephan E., David L., Falchetto H., Dorémus G., Van Canneyt O., Sterckeman O., Bretagnolle V., Ridoux V., 2013. Suivi aérien de la Mégafaune marine dans la ZEE et la ZPE de France métropolitaine, SAMM été 2012, rapport de campagne ; Agence des Aires Marines Protégées.

The ratio between the lengths of nets of recreational fishing and commercial fishing is 8 %. This ratio is obtained for the situation when all the nets are in the sea. It is an instantaneous coefficient corresponding more to the summer season when the recreational fishing is active.

What could be the bycatch impact?

Harbour porpoise is the cetacean species that is the most concerned with bycatch in the set nets of the English Channel. According to recent observations on board of commercial nets set in the English Channel (Filmancet⁸, National report for year 2011) the margin of error of the estimate of harbour porpoise bycatch in the commercial fisheries is greater than the estimate for a CV value of around 60 %. The statistical uncertainty obtained with a probability of 95 % was 200 % of the value of the estimator in the Filmancet study and at least 109 % of the value of the estimator in the annual report of France for the year 2011.

Observations and sightings in the French coasts of English Channel indicate that the areas of high abundance are concerned with commercial and/or recreational fishing activities even if the porpoise population moves seasonally. So the comparison of fishing efforts between recreational and commercial fishing can be the reflection of what happens in the harbour porpoise bycatch.

Our study suggests that for France the bycatch of porpoise in the recreational fishing of the English Channel is probably low if compared to the commercial fishing. The quantities of nets are around 8 % of the nets immersed by the commercial fishing and this indicates that the bycatch estimate is lower than the margin of error in the bycatch estimate of the commercial fishing.

Discussion

Some bycatch found in recreational fisheries of the English Channel have been declared to CRMM of la Rochelle. The data are limited and concerns only 1 or 2 porpoises per year caught in set nets mainly in March around the Cotentin peninsula.

In the winter season, the recreational fishing is not so active contrary to of the professional fishing. The seasonality of the recreational fishing activity is taken into account in our estimates as the sampling scheme for interviews is based on 5 seasonal waves and some questions were concerning the last period in year 2006.

In the North sea- Eastern Channel area, the study Filmancet has shown that the porpoise was more abundant during march-April in offshore areas and during summer in coastal areas during the year 2011 In (ASCOBANS/AC17doc4-16). According to the available information on the seasonal and geographical distribution of harbour porpoise, we can conclude that there is no evidence of biais in our comparison between recreational fishing and commercial fishing. In Western Channel, the Pingloise study and the Filmancet studies indicate that the harbour porpoises are present in spring and summer in the coastal areas. Commercial and recreational fishing are in activity during those seasons in the coastal areas.

⁸ Morizur Y., Gaudou O, Miossec D., Toulhoat L., Gamblin C., 2011. Captures accidentelles françaises de mammifères marins sur les filets calés en Manche-mer du Nord et en zones Ciem VII : observations réalisées durant les deux années du projet Filmancet ainsi que dans le cadre d’Obsmer. Ifremer, rapport technique, mars 2011. <http://archimer.ifremer.fr/doc/00035/14666/>

The SAMM result covers the entire Channel (Pettex et al., 2012) and suggests that densities of porpoise are lower in Western Channel than in Eastern Channel and south of North Sea. The densities are higher in the narrower part of the Channel. In summer, the distribution of cetacean appears dispersed in the western Channel resulting in a risk of bycatch per km of nets which is the same for recreational and commercial fisheries. In Eastern Channel the bycatch risk per km of nets is higher during winter than during summer and appears mainly linked to commercial fishing.

The risks and the quantities of nets deployed at sea suggest that the harbour porpoise bycatch in the French recreational set net fishery is probably lower than 8% of the bycatch in the commercial fishing.

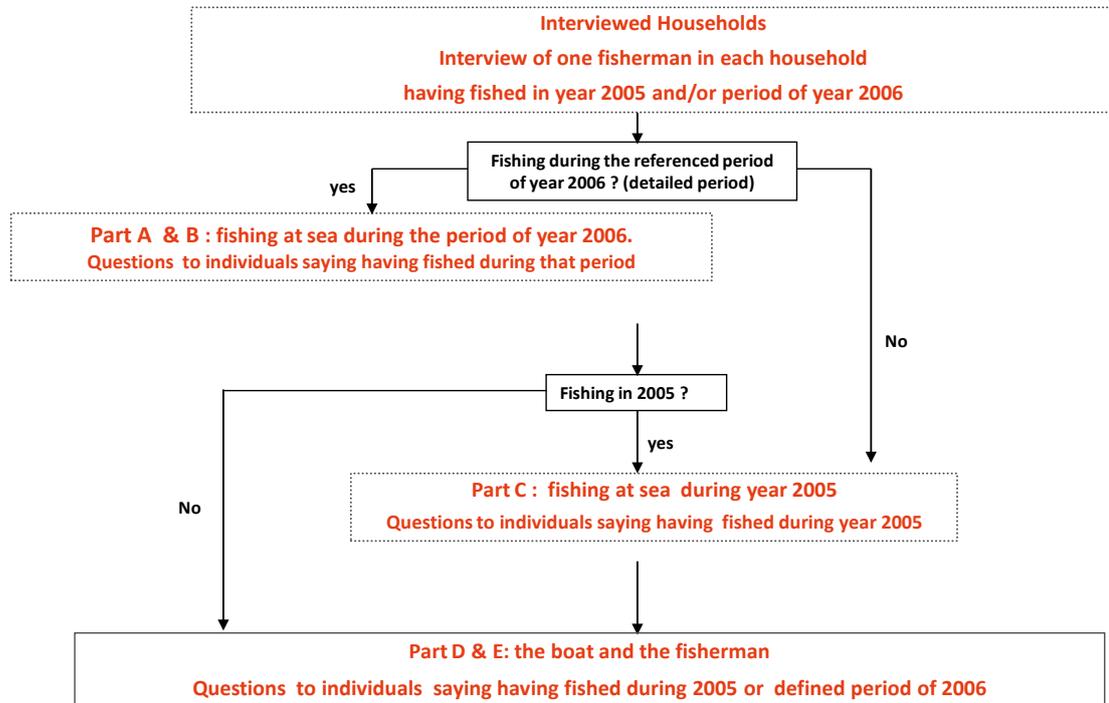
Other fishing activities in the Channel come from UK and from the Channel Islands. The figure obtained from France may change while taking into account all countries.

Conclusion

The estimate of the French recreational fishermen population and the individual quantities of nets allowed by the regulation provide an estimate of quantities of nets used in the English Channel and south of North Sea. For recreational fishing the quantity of nets is around 8 % of the professional fishing. This result corresponds to the summer season case. In the winter season the recreational fishing is not so active. The bycatch risk deduced from spatial and seasonal abundances suggests that in France the relative impact of recreational fisheries compared to the commercial fisheries is probably lower than the ratio obtained in the quantities of nets. The bycatch estimate in the French recreational fishing in the English Channel is lower than the margin of error in the bycatch estimate of the French commercial fishing in that area.

Appendix : Structure of the interview covering 5 periods of year 2006.

Methodology: structure of the interview



Rappel : A partir de la vague 2, à la différence de la vague 1, la question C1 relative à la pratique de la pêche récréative en mer en 2005 a été posée en début de questionnaire et non plus à l'issue des parties A et B.