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Pilot study of feasibility of concurrent fish length sampling in Basque Country markets

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Abstract

A pilot study of feasibility of concurrent market sampling was performed from November 2007 to January 2008, in the port of Ondarroa. The aim was to identify potential problems that will need to be faced with the implementation of concurrent sampling for length, in the frame of the European new data Collection Regulation. Concurrent sampling was applied to the landings of the bottom otter trawlers operating in the ICES area VIIIabd. This is a mixed fishery which present the most complex and variable catch composition among the fisheries of the Basque Country, in terms of number of species and number of commercial categories landed by trip. The number of samplers involved varied from 1 to 5. Only 9 vessels, from a total of 80 target vessels landing in Ondarroa, were sampled. Difficulties in the physical access to the fish, due to the lack of cooperation of the fishowners, were the main reason of no sampling. Three groups of species were defined on the basis of their type of regulation and the species targeted by the fishery. In the time window available for sampling, it was estimated that a minimum of three samplers were neccessary to cover all species landed by bottom other trawlers. Comparing with the current scheme, the shift to concurrent sampling involves a significant increase of sampling effort (and costs) that should be considered by the new Data Collection Regulation.

Introduction

The new Data Collection Regulation (DCR; in elaboration), which is expected to come into force in 2009, is considering a shift from a stock-based approach towards a fishery based approach. The revised DCR, should consequently be able to match the data demands of the existing stock-based assessements, as well as to cover the needs of future fishery based management and the ecosystem approach.

One of the methods to answer these data requirements is to organize the sampling in such a way that species are sampled concurrently by metier. Concurrent sampling means that all samplings for length composition data are done simultaneosuly on all species in a vessel's landings (STECF-SGRN, 2007). Metier is the fishing activity defined by a particular season and area of practice, a gear and a set of target species (ICES, 2003).

The Planning Group on Commercial Catch, Discards and Biological Sampling (ICES, 2007) stated that the requirements on concurrent length sampling are likely to cause significant problems for the samplers involved. In order to ease the shift, ICES (2007) suggested that the national labs perform an implementation test of concurrent sampling in an number of fishing activities in which dificulties are forseen. The aim of these studies was to reveal potential problems in relation to concurrent length sampling, that can be used to design best sampling practice schemes that fulfil the demands of the new DCR. The EU Commission followed up on this recommendation and EU Member States were requested to include this pilot study in the 2007 DCR programme. This work is the result of the study of feasibilty of concurrent sampling performed in the Basque Country during 2007.

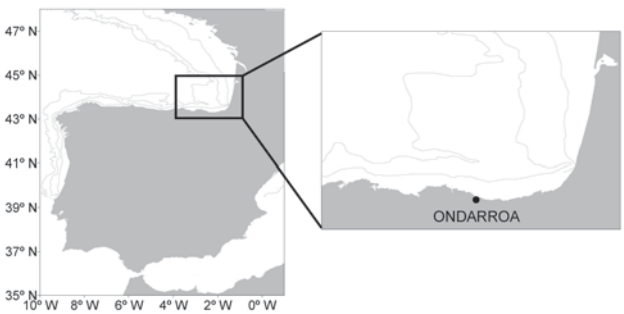

Figure 1. Situation of the port of Ondarroa

Material and Methods

In the Basque Country, the more complex metier in terms of number of species and commercial categories landed, belong to the trawler fleets (bottom otter and pair bottom). For this study, the otter bottom trawlers ("Bakas") operating in ICES Divisions VIIIabd, were selected. This mixed fishery is characterized by a complex and variable catch composition, as it exploits a high variety of species, and presents important

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Table 1. Summary table of the results. At dates marked with * two different vessels were sampled. Note that at these dates the number of vessels and commercial categories available for sampling are the same, as they refer to the same sampling day

		21/11/2007	22/11/2007	26/11/2007	27/11/2007	28/11/2007	30/11/2007	03/12/2007	04/12/2007	* 10/12/2007	* 10/12/2007	11/12/2007	14/12/2007	* 17/12/2007	* 17/12/2007	18/12/2007	19/12/2007	20/12/2007	26/12/2007	04/01/2008	07/01/2008
By sampled vessel	**Nº of target vessels**	4	1	7	4	2	1	10	2	12		1	2	7		3	2	3	7	5	7
	Nº of vessels sampled	1	0	1	0	1	0	1	0	2		0	0	2		0	0	1	0	0	0
	Nº samplers involved	4		4		5		5		1	2			2	1			3			
	Nº of species landed	26		22		21		17		22	10			29	14			15			
	Nº of species sampled	26		20		20		18		21	11			2	13			2			
	Nº categories landed	61		52		39		34		47	28			62	27			32			
	Nº categories sampled	66		46		40		35		41	31			4	30			6			
	Nº of measurements	1034		832		757		752		637	674			101	671			160			
	Sampling completed (Y/N)	Y		N		Y		Y		Y	Y			N	Y			N			
	Duration of sampling (min.)	135		80		60		75		190	138			20	100			13			

seasonal differences in terms of target species and major by-catch species. Different metiers have been defined for this fishery depending on the season (Prellezo et al., 2005). In the present study, the metier corresponding to the 4th quarter of year 2007 has been sampled.

The port of Ondarroa was chosen for the experiment (Figure 1), as it represents currently more than 90% of the landings of otter bottom trawlers in the whole Basque Country.

The period of study lasted for 47 days, from 21st of November of 2007 to 7th of January of 2008. Five samplers were involved in the experiment. They worked in groups from 1 to 5 persons in order to estimate the effort needed to complete the sampling.

Selection of vessels

In order to select the vessel to be sampled, a list of the vessels arriving to the port was wrote down every particular day, sorted by arrival time. The name, fishing gear and fishing area of each vessel were recorded in the list. In this way, the target vessels of the experiment were identified.

The sampling started with the first target vessel in the list. When it was not possible to sample the landings of the first vessel, the reasons of no sampling were recorded, and the next vessel in the list was sampled. This scheme was repeated with the rest of the vessels.

Sampling strategy

Species were allocated to groups 1, 2, 3, following the grouping made by ICES (2007):

Group 1 (target species and recovery plan):

Hake (*Merluccius merluccius*), Anglerfish (*Lophius piscatorius*), Blackbellied angler (*Lophius budegassa*), Squids (*Loligo spp.*), Cuttlefish (*Sepiidae*), Red mullets (*Mullus spp.*), Megrims (*Lepidorhombus spp.*), Lobster *(Nephrops norvegicus*).

Group 2 (TAC and major by-catch species):

Pouting (*Trisopterus luscus*), Poor cod (*Trisopterus minutus*), Whiting (*Merlangius merlangus*), Turbot (*Psetta maxima*), Mackerel (*Scomber scombrus*), Pollac (*Pollachius pollachius*), Horse mackerel (*Trachurus trachurus*), Blue whiting (*Micromesistius poutassou*).

Group 3 (all other by-catch species):

Rays (*Raja spp.*), Atlantic John dory (*Zeus faber*), Triglidae (*Triglidae*), Argentines (*Argentina spp.*), Conger (*Conger conger*), etc.

Sampling scheme 1A, as defined in ICES (2007), was utilised. This strategy consists in sampling all the species and categories landed by the target fishing activity, irrespective of the group they are included in. From each category, a number of individuals high enough to obtain a normal distribution were sampled.

Time window available for sampling

In the port of Ondarroa, there are two possible time windows to perform the length sampling. The first one is the time just after the catch is landed, before the fish sale. It starts approximately at 24h. The duration of this time window depends on the number of vessels that the ship owner has discharging at the same time and can last for more than 3h.

The second time window available takes place during the sale. This is the period of time from the moment when the fish sellers inspect the fish in the stores (just before the auction), until the moment they take it away (after the auction). The duration varies from 1h30 to 2h30 depending on the order of sale, which is set by drawing and is unknown at the beginning

Table 2. Number of samplers, number of samplings, time spent in sampling each selling category, total time and time spent to sample each group of species. Total time and time spent to sample each group of species (in minutes), were estimated using the mean number of species landed by the 68 target vessels registered during the study (Total= 46.2 species; Group 1= 18.7 species; Group 2=5 species; Group 3=22.5 species).

Nº Samplers	Nº Samplings	Time /Category	Time (Total)	Time (Group1)	Time (Group2)	Time (Group3)
1	2	4	184.8	74.8	20	90
2	2	4.7	217.14	87.89	23.5	105.75
3	2	2.2	101.64	41.14	11	49.5
4	2	1.9	87.78	35.53	9.5	42.75
5	1	1.8	83.16	33.66	9	40.5

of the sampling.

Ordinary length samplings are currently done during the sale. However, for this study the time window available just after the landing of catch was used, as it was the longest time window and the maximum time possible was needed to sample all species landed.

Results

The period of the study lasted for 46 days (from November the 21st to December the 27th of 2007), from which 18 days presented landings of the target metier. Length samplings could be carried out only during 7 days (Table 1).

From 205 vessels landing in the port, 80 (39%) were otter bottom trawlers operating in Divisions VIIIabd. Form these target vessels, 9 (11.3%) were sampled (Table 1); and from them 6 samplings were completed. The remainder three were left unfinished due to the closing of the fish store (Table 1). In the 6 samplings completed, a maximum of 26 species and 66 categories were sampled in a single vessel. The mean number of sampled categories was 40 (Table 1).

Of the 71 vessels that were not sampled, 54 (76.1%) times the ship owner did not let the samplers access to the fish; 10 (14.1%) times landings were very late; 6 (8.5%) times the fish was sold directly from the vessel; and 1 (1.4%) time the vessel arrival was not registered

During the experiment, target vessels landed a mean of 46 commercial categories of different species, per vessel. From these, 19 corresponded to Group 1, 5 to Group 2; and 22 to Group 3.

Time needed for sampling

The time needed for sampling varied depending on the number of commercial categories of all species landed, and the number of samplers involved. The longest sampling lasted 190 minutes, in which 41 different categories were sampled by only one person.

The time per category ranged from 1.8 minutes when the sampling is carried out by 5 samplers, to 4.7 minutes when there are only 2 samplers involved (Table 2). Group 3 of species was the group presenting a higher mean number of commercial categories. Therefore it was the group which needed a larger time to be sampled (106 minutes with 2 samplers involved, and 40 minutes with 5).

Discussion

The main problems found during this implementation study were related to the physical access to the landings, which depends entirely on the cooperation of ship owners. These, in the majority of sampling oportunities did not let the samplers enter to the fish stores. Difficulties in the access to the landings have been highlighted as a main common problem in the Workshp on Implementation Studies on Concurrent Length Sampling (ICES, 2008). During the course of our experiment, two were the main reasons for this behaviour:

- Ship owners do not like that the fish is handled before the sale, becasue it could be damaged with handling and its market price decreased. This is especially relevant for very delicate fishes which reach high prices in the market, as red mullets, small squids or argentines. Additionally, the problem is aggravated before and during Christmas (when the study was carried out), because the fish reach maximum prices at this time of the year.
- This was a one month- intensive sampling, and the same fish stores were sampled one day after another. In the port of Ondarroa, the totality of target vessels (14) is controlled by only 8 ship owners. During the study, ship owners felt that their own vessels were being sampled too often and they become less and less cooperative.

In addition to these difficulties, other methodological problems were found:

- In a mixed fishery like bottom otter trawlers, Group 3 includes a very large number of by-catch species (and commercial categories). This is a problem in case of a limited time window.
- In practice, the number of commercial categories sampled in the stores, in a completed sampling, is often higer than the number of categories registered in the sale notes. This may be due to the direct sale of some of the fish before the auction (Table 1).

The difficulties to access to the fish before the fish sale (only 11.3% of the vessels could be sampled), reveal the second time window (after the fish sale) as the only alternative. The duration of the second time window varies from 1h30 to 2h30 depending

on the order of sale, which is set by drawing and is unknown when the sampling starts. Supposing a reasonable duration of 2h, and considering the mean number of categories landed for each group (Table 2), there would be needed 3 samplers to complete a sampling. In the current sampling scheme (in which one single sampler perform the sampling, being supported occasionally by a second sampler), it would be possible to sample only the categories of Group 1 and Group 2 (Table 1).

It may seem striking that the time needed for category was higher for two samplers than for one sampler (Table 2). In our opinion, this two times would tend to be similar if a higher number of samplings are performed. However, it must be noted that, although the sampling time at the port is similar, the work time needed to complete the sampling is higher when there is only one sampler involved. In this situation, the measurements are recorded in a digital recorder during the sampling, and they have to be transcribed afterwards.

One way to complete concurrent sampling can be to increase the number of samplers. However, this will have an important economic cost. Additionally, increasing the sampling team has a shocking effect for shipowners. They feel that their vessels are being "over sampled" and become less cooperative.

Another possible solution could be to sample at sea the categories that cannot be sampled at the market. Indeed, in the Workshp on Implementation Studies on Concurrent Length Sampling (ICES, 2008), it was forseen that concurrent sampling should be a mixture of concurent sampling at sea and at markets, adapted to deal most effectvely with local sampling difficulties. In our case, samplings at sea may be performed taking advantage of the discards sampling programme. The results of a preliminary test show that it is possible to sample at sea all the species retained in a trip basis. This would be enough to cover minor by catch species (Group 3), and probably, also major by.catch and TAC regulated species (Group 2). However, some problems need to be solved. Firstly, an increase of on-board samplings would be needed to fulfil DCR requirements (thus, increasing the financial cost). Secondly, discard sampling is performed by species, whereas current length sampling at markets is done by commercial category.

Implications for other fishing activities

Otter bottom trawlers operating in Division VIa and Subarea VII, as well as Pair bottom trawlers operating in Subarea VII and Division VIIIabd, present also a complex catch composition (Table 3). These fishing activities are likely to have similar problems than Otter bottom trawlers operating in Divisions VIIIabd (target of the present study). Additionaly if only spanish otter bottom trawlers were considered, the variability of commercial categories to be sampled would be higher (Table 3). This is because some vessels (mainly french ones) sell part of their catches in french ports, as Lorient and La Rochelle, before landing in Ondarroa.

The rest of metiers present smaller variability in their landings, and they should not present major problems for completing concurrent length sampling by metier. Anyway, the sampling effort will need to be increased also for these metiers, as a higher number of species needs to be sampled.

Table 3. Mean number of categories landed by each fishing gear, in the port of Ondarroa, during 2007. In brackets, it is represented the mean number of categories landed by otter bottom trawlers, if French vessels are excluded.

Fishing gear	Area	Mean nº of categories
Otter bottom trawlers	VIa	33.1 (33.1)
	VII	30.0 (45.9)
	VIIIc	10.6 (10.6)
	VIIIabd	43.4 (46.6)
Pair bottom trawlers	VII	26.4
	VIIIc	18.2
	VIIIabd	36.5
Bottom longlines (British)	all	11.3
Bottom longlines	all	8.6
Bottom longlines (French)	all	7.1
Longlines	all	3.8
Purse seine	all	3.7
Baitboat	all	3.0
Troll	all	3.0
Gillnet	all	1.9
Surface longlines	all	1.8
Handlines	all	1.0

Finally, it must noted that although Table 3 was elaborated with the landings registered in the port of Ondarroa, no major differences are expected when all ports are considered.

Conclusions

The results of the preset study reveal that sampling for length before the fish sale entails a number of difficuties related with the access to the fish. This is because shipowners fear of a potential degradation of the quality and the value of the fish landed, specially for highly valued and fragile species (red mullet, small squids, etc). Sampling after the sale is limited by the duration of the time window, which is not enough to complete the concurrent length sampling of all species landed by very mixed fisheries, as bottom otter trawlers (Scheme 1; ICES, 2008). An increase of the number of samplers, or an increase of on-board sampling to complete the length-sampling of all species, will require an increment of budget that should be considered by the new DCR.

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References

ICES, 2003. Report of the Study Group for the Development of Fishery-based Forecasts. ICES Document CM 2003/ACFM: 08. Ref. D. 37 pp.

ICES, 2007. Report of the Planning Group on Commercial Catch, Discards and Biological Sampling (PGCCDBS). ICES CM 2007 / ACFM:09. 5-9 March 2007, Valetta, Malta

ICES, 2008. Report of The Workshop on Implementation Studies on Concurrent Length Sampling (WKISCON). ICES CM 2008/ ACOM:31. 29-31 January 2008, Copenhagen, Denmark

Prellezo R., Lazkano I., Castro J., Punzón A., Santurtún M., Lucio P. Iriondo A. 2005. The use of catch profiles for defining the Spanish North Eastern Atlantic trawl fisheries. Working Document presented in the Working Group for the assessment of Hake, Megrim and Monkfish, Lisbon, 2005.

STECF-SGRN, 2007. Preliminary Report of STECF Sub-Group on research needs (SGRN): Revision of the Biological data requirements under the data collection regulation (SGRN-06-03), Brussels, 27 Nov-1 Dec 2006

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