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DCF 2020 -2021

Sampling design description

Region: Baltic Sea
Data source: Commercial fishery

In 2017 Poland has implemented a new sampling design plan, moving gradually from metier based and purely opportunistic sampling towards the plan based on statistics. After a 3 year implementation, it has been updated in 2019 to improve the design, eliminating the identified shortcomings.

The following approach was applied to a new sampling plan:

Scheme – determination of the sampling scheme was based on the fishing areas. For the Baltic Sea sampling, the combination of ‘at-sea and on-shore’ scheme was used, whereas in regions outside Baltic Sea only ‘at-sea’ scheme was chosen as the only one practically possible. The defined sampling schemes are: „Baltic at sea and on shore”, „North Sea and Eastern Arctic at sea”, „Other fishing regions at sea”. A separate scheme was set for at-sea sampling of biological data, catch per unit effort and catch composition from recreational fishery for Baltic cod, defined as „At sea cod recreational fishery”.

Stratifications – there were some modifications introduced in comparison to the previous sampling design for Baltic fishery, where the stratification was formerly based on the type of vessels’ fishing technique exploiting given fish stock. This approach had some meaningful defects, where the main one was the fact that one vessel could use multiple fishing techniques so could be assigned to more than one strata, what is statistically wrong. The previous sampling design resulted in high refusal rate, caused among others by the fact that being selected, a vessel was not sampled because it changed gear or target species so was no longer compliant with the PSU group it was initially assigned to. To avoid such a situation in the future, a change was introduced in the way of defining strata, which are now based on the vessels’ length category.

Sampling frame – all vessels that were active (at least one fishing trip) in 2018 make a list that is a proxy for selecting the PSUs. According to WKPICS 2013:

“At-sea sampling with trips as primary sampling units. When trips can be selected randomly from a fleet of vessels, at least approximately, it is often reasonable to treat vessel-trips as the primary sampling units. In such cases, the list of all trips (obtained at the end of the year) makes up the sampling frame. This is a virtual frame that cannot be used in stage 1 to select the trips. The actual selection is typically based on a frame with a vessel list crossed with time.”.

Coverage – assuming the target population consists of all vessels that were active in 2018, the coverage of target population equals 100%.

Primary Sampling Unit (PSU) is „vessel trip”

Sampling intensity – in order to maintain the continuity of the sampling intensity compared to the previous years, the annual number of samples to be collected during 2020-2021 period is at the same level as during the previous multiannual programs (2014-2019). Both at sea and on shore sampling will be continued. In order to obtain independent, scientific data on discards, at sea sampling will be conducted as the first choice, if not possible then on-shore sampling will be conducted.

Sampling of the Baltic Sea fisheries is based on a quarterly basis. To define the sampling intensity per each stratum per quarter, the half of the total annual number of samples was distributed proportionally to the quarterly distribution of landings and the second half of the total number of samples was distributed proportionally to the total number of trips. It was decided to include both parameters in order to distribute the sampling effort reflecting the different segments of the fishing fleet. So to take into consideration vessels that have the bigger share in total catches (*i.e.* larger vessels) as well as vessels that have much more fishing trips but small catches (*i.e.* smaller vessels, active mainly in a coastal fishery).

In case of sampling fisheries outside the Baltic Sea, fishing trips to sample are not selected randomly but depend on practical or regional considerations (see comments in Table 4A of the WP).

Reference years – in case of the Baltic Sea fisheries only 2018 data were used as the reference year, treating it as a most reliable period. Basing on this, we get the sampling frame that is more up to date than it would be if the last 3 years were used. With this approach, it will be possible to reduce the refusal rate eliminating the refusals like ‘vessel withdrawn’, ‘vessel under renovation’ etc. For fisheries outside the Baltic Sea, the three years period of 2016-2018 was applied as a reference years.

Sample selection – in case of the Baltic Sea fisheries sampling, for each quarter and for each stratum a list of vessels will be randomly selected with replacement from a sampling frame. The number of vessels selected will be overrated, to take into account potential refusals and to avoid additional draws. The number of extra vessels to be drawn, has been estimated based on refusal rate from the period 2017-2019. In case, the selected number of vessels will not be enough (more refusals than expected, *e.g.* lack of contact with the vessel, refusal to take observer on board or provide landed fish for sampling on shore), the supplementary drawing will be performed to maintain the desired number of vessels trips to sample. The concrete vessel trip will be chosen depending on the observer availability. List of vessels selected for sampling will be recorded in a register. This register will contain information on date of selection, date the vessel was contacted to arrange sampling, information if contact with the vessel was successful or not, vessel’s owner acceptance or refusal to be sampled (as well as reasons in case of refusal).

Data archiving and quality checks – Data entered to the national database are verified in the two-stage validation process supported by a number of completeness, data type and range checks. Export procedures which prepare data sets for external databases (like RDB FishFrame or InterCatch) also perform basic checks. Additionally, a number of quality reports were developed to improve the completeness and reliability of the data.

Coverage of fish stocks – as the stratification is based on vessel length and does not put any restrictions on stock sampling, simulations were carried out in order to investigate the potential

coverage of stocks fished and metiers used. Using the official 2018 data, the test drawing for all strata was carried out. The average number of samples per fishing stock and metier was calculated after 100 iterations made to check the coverage. The result of these simulations showed that planned sampling design described above provides good coverage of fish stocks.

Until 2016, sampling programme was based on an opportunistic approach. Due to the confidentiality of personal data, the Institute executing the DCF had no full register of the fishing vessels' owners with contact details. Sampling was based on the cooperation with the owners of over 100 vessels (c.a. 12% of all Polish vessels), built over the years on the basis of trust. During last three years efforts were being made to gain access to the full register of vessels' owners. The list of contact details to vessels' owners systematically expands but the process is extended in time. Therefore, the main expected difficulties in execution of the sampling programme is potentially high level of non-response and/or refusals.

References

Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC (OJ L 354, 28.12.2013, p. 22).

Regulation (EU) 2017/1004 of the European Parliament and of the Council of 17 May 2017 on the establishment of a Union framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy and repealing Council Regulation (EC) No 199/2008 (OJ L 157, 20.6.2017, p. 1)

Commission Delegated Decision (EU) 2019/910 of 13 March 2019 establishing the multiannual Union programme for the collection and management of biological, environmental, technical and socioeconomic data in the fisheries and aquaculture sectors (OJ L 145, 4.6.2019, p. 27.)

Commission Implementing Decision C(2019) 9492 of 19.12.2019 approving the work plan of Poland for data collection in the fisheries and aquaculture sector for the period 2020-2021

ICES. 2014. Report of the third Workshop on Practical Implementation of Statistical Sound Catch Sampling Programmes, 19-22 November 2013, ICES HQ, Copenhagen, Denmark. ICES CM2013/ACOM:54. 109 pp.