(ver. 1.0; October 2024)

Maciej Adamowicz,
Katarzyna Krakówka,
Ireneusz Wójcik
Department of Logistics & Monitoring
National Marine Fisheries Research Institute
Gdynia, Poland

DCF 2025-2027
Sampling design description

Region: Baltic Sea
Data source: Commercial fishery
Schemes: Baltic at sea, Baltic on shore

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. Afterwards in 2021, based on the recommendations received and experience gained, the further changes have been implemented. The 2025-2027 sampling plan will continue to implement similar principles to those used in 2022-2024.

The following approach was applied to the sampling plan:

Scheme – determination of the sampling scheme is based on regions. For the sampling in the Baltic Sea, following the recommendation from STECF EWG 21-09, two separate sampling schemes were created: '**Baltic at sea'** and **Baltic on shore**'. However, given the national specificities, sampling in both schemes is carried out in a combined manner. Sampling at sea is assumed to have a higher priority over sampling on shore, which is only conducted when there is no possibility to have a scientific observer on board.

Stratifications – Population is stratified based on the **vessels' length category**.

The following strata were defined:

- BAL VL0010 – Baltic vessels under 10 meters in length
- BAL VL1012 – Baltic vessels between 10 and 12 meters in length
- BAL VL1218 – Baltic vessels between 12 and 18 meters in length
- BAL VL1824 – Baltic vessels between 18 and 24 meters in length
- BAL VL2440 – Baltic vessels between 24 and 40 meters in length

The main advantage of stratifying the population by vessel length categories is that every vessel belongs exactly to one group only. Additionally, such approach was found to be very flexible in case of sudden changes in the fisheries caused by e.g. change in a legislation, natural causes. Moreover, the sampling scheme is also stratified by quarters, with various sampling intensities assigned to each quarter calculated based on the historical data. The list of primary sampling units is drawn separately for each quarter.

Sampling frame – all vessels that were active (at least one fishing trip), in the latest available catch data of three years, 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 2021-2023, 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 2025-2027 period is at a similar level as during the previous multiannual programs (2014-2024). Both at sea and on shore sampling will be continued. The planned number of samples was equally divided between 'Baltic at sea' and 'Baltic on shore' schemes.

Sampling of commercial fisheries in the Baltic Sea is conducted on a quarterly basis. To define a plan of sampling intensity, the total planned number of sampled trips was distributed to groups of PSUs and quarters based on official catch weight and number of trips of the entire fleet. Groups related to small scale fisheries have relatively high number of trips and low catch weight, unlike larger vessels. Several allocation factors were tested and ultimately a factor based in 60% on number of fleet trips was chosen. The remaining 40% of the allocation was based on fleet catches. This approach is expected to sufficiently cover small and large-scale fleet.

Reference years –2021-2023 data were used as the reference year

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 from a sampling frame. The method of PSU selection is based on unequal probability sampling with replacement. The sampling probabilities assigned to vessels will be calculated as their average annual landings over the last available three years. The result of PSU selection will form a list of trips to sample in a given quarter and group of vessels.

The execution of the sampling plan will be monitored on a regular basis throughout the year, taking into account the achieved coverage of stocks, areas, quarters, gears and vessel length categories. If the number of sampled trips is not sufficient (due to e.g. high refusal rate, lack of contact to vessel owners, etc.), a decision can be made to organise ad-hoc expert trips to improve the coverage. The complementary trips will be chosen depending on the observer availability.

A maximum of five attempts are made to contact a vessel owner. If a contact was successfully made, a vessel owner is first asked if it is possible to take observer on board. If at-sea sampling is not possible, then a vessel owner is asked if an observer can take a sample from the landings. List of vessels selected for sampling will be recorded in a register. This register will contain information on a date of selection, date the vessel was contacted to arrange sampling, full history of contact, 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 a 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 RDBES 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. Based on the designed sampling plan, a simulated selection of vessels and trips was conducted using the data from 2023. The list of PSUs used for simulation consisted of all vessels active in 2023. Unequal probability sampling with replacement was applied to draw vessels from the list. The probability of a vessel being selected is determined by an average annual catches from the period 2021-2023. In the second step, trips were selected using simple random sampling without replacement. The result of these simulations showed that the planned sampling design described above provides good coverage of fishery types and major stocks, which are not currently subject to any fisheries closures.

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) 2021/1167 of 27 April 2021 establishing the multiannual Union programme for the collection and management of biological, environmental, technical and socioeconomic data in the fisheries and aquaculture sectors from 2022 (OJ L 253, 16.7.2021, p. 51–90)

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.