

Sampling scheme for scientific observers in Northwest Atlantic Fisheries Organisation (NAFO) and North East Atlantic Fisheries Commission (NEAFC) areas.

1. Objective

To collect biological data on catches, by-catches and discards from commercial fisheries and to record, independently of the crew, relevant information on the technical characteristics of the fishing vessel, fishing gear and direct fishing activities. The activities of observers must comply with the Regulation of the Minister of Environment No 39 (2017) "Necessity of taking an observer on board, appointment of the observer, observer requirements, observer tasks and the procedure and format for submitting the data collected". Observer trips in the NAFO Area shall be guided by the Conservation and Enforcement Measures (CEM) in force in NAFO.

2. Primary sampling unit (PSU)

The primary sampling unit is the fishing trip of the fishing vessel.

3. Sampling frame description

The sampling frame consists of all Estonian vessels fishing in the NAFO and NEAFC areas.

4. Selecting the primary sampling unit for a fishing trip

In the NAFO Area, the presence of an observer on board is mandatory in accordance with the NAFO Conservation and Enforcement Measures (CEM), unless the fishing vessel has requested to be exempted and has fulfilled the required preconditions.

In the NEAFC (ICES I, II and XIV) area, samples must be collected from at least one fishing trip per quarter (four trips per year in total). Fishing trip observations during the year should be carried out by different vessels. Sending an observer to the selected vessel will only be possible with the agreement of the owner of the fishing vessel and subject to the availability of a cabin on board. If it is not possible to send an observer to the selected vessel, an alternative choice will be negotiated with the fishing vessel company.

5. Sampling frequency and spatial coverage

In NAFO and NEAFC fisheries, observers shall collect samples throughout the fishing voyage while on board the fishing vessel in accordance with the collection plan established for the fishing voyage. The collection plan shall be drawn up taking into account the expected number of fishing trips per year and the overall annual collection plan shall be broken down by fishing trip and by fishing area. The collection plan for a fishing trip shall be based on the planned number of samples by species, area and biological parameters. After the first fishing trips have been made, the annual collection plan shall be calculated and the remainder shall be distributed among the fishing trips not yet made. In the NAFO area, fishing activities and sampling by fishing vessels shall take place in Sub-areas 3KLMNO and in ICES Sub-areas I, II and XIV respectively in the NEAFC area. If an observer is unable to follow the collection plan for a fishing trip due to the absence of species to be collected from the catch of the fishing vessel or if the number of samples planned for a given sub-area is full, observers on board shall collect samples from the available catch on a random basis.

6. Sample size and composition

Observers on board the fishing vessel shall sample a single haul and the recommended sample size shall be at 25 to 50 specimens in the case of a fish sample and at least 1- 1,5 kg (200 specimens) in the case of a shrimp sample. A container shall be used as an aid to sample, so that specimens are randomly selected. If

the use of a container for sampling is not possible, e.g. due to too large fish, the observer shall collect the fish sample directly from the line at the fish container. In this case, the fish sample shall consist of individuals collected consecutively from the line over a period of time. After the fish have been analysed, the process is repeated to ensure that different parts of the catch are sampled. The collected sample is species-identified and the proportion of by-catch species is estimated. Biological analyses shall be performed on the target and by-catch species represented in the collection plan.

When collecting the discard sample, the observer collects fish and invertebrates discarded by the crew members within a fixed time. Species from the collection plan that are present in the discard sample are analysed and the remaining species are estimated in proportion to the time taken to process the total catch.

The assessment of by-catches of sharks, marine mammals, birds and reptiles shall be carried out, if possible, on the trawl deck of the fishing vessel at the moment of the discharge of the trawl net head. The Greenland shark and any other larger specimens shall be released from the trawl deck. In the presence of large by-catch, the observer shall identify the species and estimate the size of the specimen. The data collected shall be entered in the observer reporting table (NAFOs Annex II.M).

From the species found during sampling and monitoring of processing, the observer will record potential indicator species of marine areas at risk by taking pictures of the specimens and recording relevant information on the trawl catch. If it is not possible for the observer to identify the species while at sea, this shall be done after the end of the trip on the basis of the image and description.

7. Data to be collected from the sample and accuracy of measurement

The observer records the following parameters during the biological analysis of the fish:

- date
- fishing area
- trawl haul number
- fish species
- full length – TL (0,5 cm)
- mass of the specimen (10g)
- sex and degree of maturity according to the species guide.
- Otolith number

Species and full length are determined for all specimens, but the remaining parameters are sampled from at least 20 specimens of one species per sample where possible, according to the trip sampling plan.

In addition, observers shall collect detailed information on the vessel, fishing activities and catches in accordance with the requirements of the NAFO CEM form Annex II.M. The same background information shall be collected by observers during an observation trip in the NEAFC fishery. In addition to the technical data of the vessel, observers shall measure the mesh sizes in the different parts of the trawl nets used for fishing and record the fishing activity by haul. Catches and discards are recorded by species in kilograms.

The observer records the following parameters during the biological analysis of the shrimps:

- date
- fishing area
- trawl Drawing Number
- total sample weight

- number of specimens in sample
- the total weight of specimens suitable for measurement
- sex and sexual maturity of shrimp (*male, transitional, primiparous female, multiparous female, and female carrying external eggs*)
- shrimp carapace length to the nearest 0,5 mm, with rounding the length group 13,5 is 13,25 to 13,74 mm and the length group 14,0 is 13,75 to 14,24 mm.

8. Retention of basic data

Observer-collected baseline data will be stored in an agreed MS Excel format on the responsible staff member's computer and back-up copies on an external hard drive. The primary data collected in the NAFO Area shall be transmitted to the European Commission, the NAFO Secretariat and the Ministry of the Environment.