Sampling of herring and sprat from the commercial trawl fishery

1. **Purpose of sampling**

The general aim of the sampling is obtaining biological information on the structure of the commercial catches: which length/age groups prevail in the catches and how the fishery affects on the stock structure.

2. **PSU (primary sampling unit).** PSU is the fishing trip.

3. **Sampling frame.** All Estonian fishing vessels using pelagic trawls.

4. **Sampling frequency and spatial coverage.**

   Sampling takes place on monthly basis: every month 3-4 samples of herring and sprat are collected from the commercial catches in sub-divisions (28-1, 28-2, 29, 32).

5. **Selecting the fishing vessel and trip.**

   Samples are collected once a week if possible. The vessel is selected from the pool of active vessels according to VMS info. The vessels not sampled recently are preferred. The vessels length class (18-24 m and 24-42m) is also considered. The skipper is contacted to agree the sampling harbour and time. Sampling is not performed during the night-time. The sampling takes place at the spot of first sale would be preferable if possible. Refusal of sampling by the crew and the cases when it is impossible to sample due to remote location of the harbour is recorded.

6. **Sample size.**
   A sample of app 10 kg (1 bucket) is collected per trip in order to estimate the species composition of the catch (specimens by species are counted and weighed). The sample is taken from the different parts of the catch e.g. from different containers. If the catch is strongly dominated by the one species (99%), app 200 specimens are randomly collected in case of sprat and 120 specimens in case of herring. In case of mixed catch, the dominant species is sampled as described above and from the bycatch species up to 120 specimens of herring and up to 200 specimens (not less than 30 fish), are sampled in case of sprat as a by-catch.
   In case of sprat a total length of all specimens is measured and the fishes are weighed by the length groups. Additionally, the total length (TL), individual weight, sex and maturity stage are estimated and the otoliths (*sagittae*) are collected for age determination. For herring all fish are measured (total length), individual weight, sex and maturity stage are estimated and otoliths (*sagittae*) are collected for age determination.

7. **Information obtained from sampling and precision**

   Info to be obtained from skipper:
   - Length of the trip

- Mesh size
- Number of hauls during the trip
- Coordinates and timing of hauls (start and end)
- Average depth of trawl haul
- Average depth of the sea on the trawl track
- Catch weight by species (kg)

Data to be recorded in lab:

- Total length (TL (0.1 cm))
- Individual weight (0.1 g)
- Sex and maturity stage (according to 6-stages scale described in the BITS manual)
- Collection of otoliths (*sagitta*) for age determination
- Age determination is performed from the otoliths rinsed in the alcohol with microscope using the upper lighting.

8. Data storage

Primary data are storage indefinitely both on paper and digitally. The primary data are recorded as the Excel files with agreed format and stored in the PC of the responsible scientist and in the database of MEI. All otoliths are deposited in the archived of the EMI. Technical parameters of the sampled vessels are obtained from the Estonian Fishing Vessel Registry.