FACTSHEET: Research surveys shellfish Dutch coast (ENSIS)

Version: [v1, 30/03/2023]

Sampling protocol: ENSIS	
Sampling objective(s): stock size estimates and time series for commercial bivalve species	
Start of sampling: 1994	
Sampling ongoing: yes	

Data use

Primary: Annual stock assessments of commercially exploited bivalve species are used by the Dutch ministry of agriculture, nature and food quality (LNV) to manage permits for fishery on razor clams (*Ensis* sp.) and cut-trough shells *(Spisula subtruncata)*.

Secondary: Annual stock assessments and time-series are used to assess whether other species might become sufficiently abundant for exploitation (users: LNV and the fishery industry). Time series are to be used for evaluations of changes in fishery policy (LNV), changes in nature policy and management (LNV, the Dutch ministry of infrastructure and water management - through their executive agency Rijkswaterstaat), and are also used for various environmental impact studies (Rijkswaterstaat, fishery industry and other industries e.g. the harbour of Rotterdam) and fundamental scientific research (universities and research institutes e.g. Royal NIOZ).

Sampling design and method

The research area is the Dutch North Sea coastal zone, ranging from the Belgian to the German border. The outer boundary is located 12 miles offshore, except in the southern part (Voordelta) where the 20 m depth contour is followed. Approximately 880 stations are sampled annually in spring (April-June) in a stratified setup where the density of stations is increased (and the distance between stations reduced) in areas with an elevated encounter chance. Six different strata are distinguished. All sampling is done within the Dutch national boundaries.

Sampling protocol and data capture

In the field: bottom samples are taken using two devices: a suction dredge and a towed bottom dredge. Both devices sample the upper (resp.) 7 or 10 cm of the seafloor over a surface area that is determined by the length of the haul. With the suction dredge a typical haul length is 150 m resulting in a surface area sampled of 30 square meters. With the towed dredge the figures are 150 m and 15 square meters. Samples are sieved over a mesh of 5 mm. With the suction dredge, typically a subsample of 1/7th is taken. In the lab on board, samples are processed further. Further subsampling may be necessary based on the amount of material. Target species (commercially exploitable bivalves, all other molluscs, starfish and crabs) are sorted by species, some in age/size classes, and counted and weighed per species/class. *Ensis* sp. are sorted into commercial size (tip width 16 mm or larger) and smaller individuals. *S. subtruncata* are sorted into 1-year and older individuals based on a shell length of 19 mm. Only intact specimens are weighed. The wet weight including shell is registered. Of deep-living animals such as razor clams, only the shell tips or siphons are caught. The widths of razor clam tips are measured to the nearest 0.1 mm. Data are entered in an Access database. Backups are made daily. All practical work is completed on board.

At the office, the data are used to calculate stock sizes for the primary target species *(Ensis* sp. And *S. subtruncata*) and other some other species potentially interesting for exploitation *(Donax vittatus*, *Chamelea striatula* and *Lutraria lutraria).* Stock sizes are calculated as the total number of individuals and for the total biomassa (fresh weight including the shell), by multiplying the number or biomass per square meter per station with the total surface area represented by that station and summing up the

values of all stations. For deep-living animals that are not caught intact, total biomass is not calculated except for *Ensis* sp. For *Ensis* sp. individual weights are derived from the measured shell tip widths using a regression that was compiled over the years.

Data quality

Quality checks are conducted upon processing at the institute, and before entry into the database. Standardized checks include checks for outliers in numerical data (e.g., sampled surface area, subsampling factor, number of individuals, biomass and/or length measurements) This is done either by plotting or by providing minimum, mean, and maximum values. Text variables are checked for consistency (e.g., station coding, crew members, gear type, grid information). Checks for missing values are performed. In addition, coordinates are checked on a map and compared to planned locations plus planned sampling-grid information.

Data storage

National database: CSO shellfish database

International database: -

Data availability

Institutional availability: data is available for reporting about a month after the survey ends.
Internal availability is described in Proc_databases

Public availability: data is made available once a year in the first quarter
https://www.wur.nl/nl/artikel/Schelpdiermonitor.htm
https://viewer.openearth.nl/ihm-viewer/?layers=85222914&layerNames=Benthos&folders=85223020

Reference to full documentation:

Troost, K., M. van Asch, E. Brummelhuis, D. van den Ende, J. Perdon, C. van Zweeden, J. van Zwol, J. van der Pool & Y. van Es, 2023. Handboek bestandsopnames schelpdieren WOT Versie 4, januari 2023. Internal CVO report: 22.017 (CVO_h002).

Review frequency full documentation: annually or biennially

Factsheet author(s): Troost, K.

Factsheet latest update: 30/03/2023

Factsheet latest review: 30/03/2023