Data Quality document for eel sampling & analysis within the German DCF programme

DCF Eel Germany, Eel_Comm_inland

Background:

The sampling of commercial eel fisheries is carried out in all German EMUs, with sampling design and implementation as well as data capture, storage and processing being largely identical. Therefore, a single sampling scheme is reported referring to biological data from all relevant EMUs (namely DE_Ems, De_Eider, DE_Elbe, DE_Wese, DE_Rhe and DE_Schl). DE_Maas has no commercial fishery, for DE_Warnow data is reported from a scientific monitoring and DE_Oder is reported as whole EMU Oder by Poland based on a bilateral agreement.

Deviations from this sampling scheme will be reported as separate series.

Sampling Scheme:

From 2009-2018, sampling aimed at the collection of 100 yellow and silver eels per EMU, which were bought from commercial fisheries and used for biological sampling. Sampling was aimed at

  i)   the collection of eels from the main (usually name giving) water body in the respective EMU
  ii)   buying unsorted catches that were
  iii)   derived from gears that are non-selective above the minimum landing size

collecting information on age, sex, mass, length and maturity (silvering index, SI).

The primary objectives of the biological sampling, besides creating a time series of biometric data, was the calculation of EMU specific growth functions, which was achieved by 2018.

Starting in 2018 until today, given that there was no longer a distinct end-user need for age data, eels were no longer killed but biological data was collected on-site and eels were retained by fishers, thus drastically reducing the number of sacrificed fishes. Since sufficient spatial coverage to derive meaningful information from silver eel catches is hardly achievable, sampling was focused on silver eels in downstream locations since this life stage accumulates in time and space and is therefore considered to provide a better profile of the overall population in an EMU. However, availability of catches still is a limiting factor, and due to the potentially insufficient temporal coverage, samples often reflect periods of peak migration. This issue is further addressed in Eel_Ems_cont.

The primary objective of the current data collection is to provide biometric time series and further provide data towards the application and validation of the currently used stock assessment model.

In some cases, non-representative data are collected, e.g. because a specific size class is required for a growth function, which is indicated in the data. Also, often additional data relevant to the stock assessment, e.g. on eel spawner quality (fat content, contamination) is collected, which is stored alongside the base data.

Data capture / Quality checks:

Since there is currently no internationally established standard for the collection and storage of eel data (except for the ICES/ EIFAAC WGEEL database, which is not (yet) part of the RDBES), there is little use in the creation of a standalone national database for the European eel at this point. Due to the relatively simple nature of the collected data and the fact that it is not stored in a database, no automated quality checks are performed on biological data on eel.

The data are captured on-site in a written protocol and double-checked when digitalized in an Excel table. Checks are performed by data visualization, e.g. length-mass relationship or length-age relationship and testing whether single data points are within a reasonable range (e.g. size of males <50cm). In case of discrepancies, data are reviewed and discarded if they cannot be evaluated.

Additional quality checks are applied for age reading, which is conducted according to the guidelines provided by ICES WKAREA2 (ICES, 2011). Otoliths are prepared using the cut-and-burn method and blind age readings (i.e. without knowledge of other biological data) are performed by two independent readers to ensure precision of readings. In case of discrepancies, age readings are being reviewed. The accuracy of age readings cannot be confirmed without dedicated studies, but readers were trained and did comparative readings during WKAREA2.

Documentation on editing:

When edited, a separate version of the Excel file is stored and archived and information on editing is stored alongside the data.

DCF Eel Germany, Eel_Ems_cont

Sampling Scheme:

Starting in September 2020, biological data are collected from all catches of a continuously fishing single stow-net in the river Ems and will be continued until spring 2022. Data collected include length, mass, maturity (silvering index, SI) and based on the index an estimate of the sex. Age readings will be performed on a subsample of eels representing the length distribution found.

The objective of this study is to derive high resolution temporal migration patterns and compare biometric features of migrating silver eels at different points in time. These data will allow for an evaluation of potential future sampling schemes with reduced effort, while maintaining robust statistical results.

Data capture / Quality checks:

As a one-off study, data are not stored in a database and validation and quality checks are carried out analogue to Eel_Comm_inland: Data are captured in a written protocol and double-checked when digitalized in an Excel table. Checks are performed by data visualization, e.g. length-mass relationship or length-age relationship and testing whether single data points are within a reasonable range (e.g. size of males <50cm). In case of discrepancies, data are reviewed and discarded if they cannot be evaluated.

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Documentation on editing and imputation:

When edited, a separate version of the Excel file is stored and archived. Data on imputation are stored alongside each set of data points in the file.

References:

ICES (2011). Report of the Workshop on Age Reading of European and American Eel (WKAREA2), 22-24 March 2011, Bordeaux, France. ICES CM 2011/ACOM:43. 35 pp. + Annex 5: Manual for the Ageing of Atlantic eel: Otolith preparation methodologies, age interpretation and image storage, produced by the participants of the ICES Workshop on Age Reading for European and American Eel, version 2, April 2011.