

Federal Ministry of Agriculture, Regions and Tourism

Regulation (EU) 2017/1004 of 17 May 2017 of the European Parliament and the Council

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

Commission Implementing Decision (EU) 2019/909 of 18 February
2019 establishing the list of mandatory research surveys and thresholds for the purposes of
the multiannual Union programme for the collection and management of data in the fisheries
and aquaculture sectors

Commission Delegated Decision (EU) 2019/910 of 13 March 2019
establishing the multiannual Union programme for the collection and management of
biological, environmental, technical and socioeconomic data in the fisheries and aquaculture
sectors

Commission Implementing Decision (EU) 2016/1701 of 19 August
2016 laying down rules on the format for the submission of work plans for data collection in
the fisheries and aquaculture sectors.

Commission Implementing Decision (EU) 2018/1283 of 24 August
2018 laying down rules on the format and timetables for the submission of annual data
collection reports in the fisheries and aquaculture sectors.

Austrian Annual Report for data collection in the fisheries and aquaculture sectors

2020

Vienna, 31 May 2021

CONTENTS

- SECTION 1: BIOLOGICAL DATA 3
 - Text Box 1C: Sampling intensity for biological variables 3
- SECTION 1: BIOLOGICAL DATA 3
 - Text Box 1D - Recreational fisheries 3
- SECTION 1: BIOLOGICAL DATA 3
 - Pilot Study 1: Relative share of catches of recreational fisheries compared to commercial fisheries..... 3
 - Pilot Study 1a: Data collection of whitefish and arctic char stocks in Alpine lakes of Austria (Work programme 2017-2019, final report delivered in 2020).....4
 - Pilot Study 1b: Fish stock evaluation in the southern part of Lake Neusiedl 6
- SECTION 1: BIOLOGICAL DATA 8
 - Text Box 1E: Anadromous and catadromous species data collection in fresh water..... 8
- SECTION 1: BIOLOGICAL DATA 9
 - Text box 1F: Incidental by-catch of birds, mammals, reptiles and fish 9
 - Section 1: Biological Data..... 9
 - Pilot Study 2: Level of fishing and impact of fisheries on biological resources and marine ecosystem 9
- SECTION 1: BIOLOGICAL DATA 10
 - Text Box 1G: List of research surveys at sea 10
- SECTION 2: FISHING ACTIVITY DATA 11
 - Text Box 2A: Fishing activity variables data collection strategy 11
- SECTION 3: ECONOMIC AND SOCIAL DATA 12
 - Text Box 3A: Population segments for collection of economic and social data for fisheries 12
- SECTION 3: ECONOMIC AND SOCIAL DATA 12
 - Pilot Study 3: Data on employment by education level and nationality 12
 - Pilot Study 3a: Socio-economic data in the fisheries and aquaculture sectors in Austria 13
- SECTION 3: ECONOMIC AND SOCIAL DATA 17
 - Text Box 3B: Population segments for collection of economic and social data for aquaculture 17
- SECTION 3: ECONOMIC AND SOCIAL DATA 18
 - Pilot Study 4: Environmental data on aquaculture 18
- SECTION 3: ECONOMIC AND SOCIAL DATA 20
 - Text Box 3C: Population segments for collection of economic and social data for the processing industry 20
- SECTION 4: SAMPLING STRATEGY FOR BIOLOGICAL DATA FROM COMMERCIAL FISHERIES..... 21
 - Text Box 4A: Sampling plan description for biological data..... 21
- SECTION 5: DATA QUALITY 21
 - Text Box 5A: Quality assurance framework for biological data21
- SECTION 5: DATA QUALITY 21
 - Text Box 5B: Quality assurance framework for socioeconomic data 21

SECTION 1: BIOLOGICAL DATA

Text Box 1C: Sampling intensity for biological variables

General comment: This box fulfils paragraph 2 point (a)(i)(ii)(iii) of Chapter III, of the Annex of the Delegated Decision (EU) 2019/910 and Chapter I of the Implementing Decision (EU) 2019/909 on the multiannual Union programme; and Article 2, Article 4 paragraph 1 and Article 8 of the Implementing Decision (EU) 2016/1701 on the format of the WP. This box is applicable to the Annual Report.

Member State should provide by Region/RFMO/RFO/IO:

Not applicable as Austria is a land-locked country and no work was foreseen in the WP 2020-2021.

SECTION 1: BIOLOGICAL DATA

Text Box 1D - Recreational fisheries

General comment: This box fulfils paragraph 2 point (a) (iv) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2, Article 3 and Article 4 paragraph 1 of the Implementing Decision (EU) 2016/1701 on the format of the WP. This box is applicable to the Annual Report. This box is intended to provide information on the design, implementation and analysis of all components of sampling schemes/ surveys that are listed in Table 1D.

Not applicable as Austria is a land-locked country and no work was foreseen in the WP 2020-2021.

SECTION 1: BIOLOGICAL DATA

Pilot Study 1: Relative share of catches of recreational fisheries compared to commercial fisheries

General comment: This box fulfils paragraph 4 of Chapter II of the Annex of the Implementing Decision (EU) 2019/909 on the multiannual Union programme and Article 2 and Article 4 paragraph (3) point (a) of the Implementing Decision (EU) 2016/1701 on the format of the WP.

General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study.

Quote from the 2020-2021 Work Programme: Not applicable as Austria is a land-locked country.

No work was foreseen in the WP 2020-2021.

Pilot Study 1a: Data collection of whitefish and arctic char stocks in Alpine lakes of Austria (Work programme 2017-2019, final report delivered in 2020)

General comment: This box fulfils paragraph 4 of Chapter V of the multiannual Union programme and Article 2 and Article 4 paragraph (3) point (a) of the Decision (EU) 2016/1701.

General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study.

1. Aim of pilot study

For a long-term and effective management of commercially used fish stocks (whitefish) it is of the utmost importance to not only keep catch statistics, but also to regularly collect data on population structure and stock size. With such regularly collected data, it is possible to suitably analyse changes in fish stocks and to timely respond to changes. Age and length structures, growth, condition factor and age at maturity constitute important and essential fish biological basic data in this context. To estimate the amount of fish that can be taken sustainably, a hydroacoustic assessment of fish biomass is essential. It is the aim of the proposed pilot study to create a suitable starting point for ensuring optimum response in the event of landlocked countries being subject to a mandatory collection of socio-economic data in the future.

2. Duration of pilot study

The main fish species exploited commercially in the Austrian lakes is whitefish, and, accordingly, whitefish stocks are subject to high fishing pressure. Thus, for the period 2017-2019, the examination of whitefish stocks in lakes in northern and southern parts of the Alps, at least in ten Austrian lakes is planned. The collection takes place annually in late September/early October respectively.

3. Methodology and expected outcomes of pilot study

The fish (appr. 150 animals per examination year) are caught using a fleet of gill nets with 9 different mesh sizes (15, 20, 25, 30, 35, 45, 55 and 70 mm) or with standardised Nordic multi-mesh nets. The aim in this context is to catch, to the extent possible, all age groups equally well. In order to be able to compare the samples of the different lakes, the catches are performed as CPUE (catch per unit effort). The caught fish are measured, weighed and tested for abnormalities (damage caused by hooks, injuries, parasites, etc.). Moreover, scale samples (whitefish) are taken for determination of age, sex and maturity stage age.

From a scientific point of view it is necessary that the method development and data collection in the Austrian lakes with a study on 10 to 11 lakes is the minimum requirement to make a relevant statistical statement. Due to the different naturerelated conditions, there are influences on the results of the survey, which can not be determined in advance. Only with a statistically sufficiently secured data situation can these factors be determined and correspondingly taken into account in the interpretation of the data. Data sets from less than 10 lakes produce higher statistical uncertainties and may lead to a misinterpretation of the data and results obtained.

Age determination will be made by counting annually from projected slide images of dried and cleaned scales. Two independent readers, to whom information such as length or weight will not be available, have to age each fish three times. The most frequent age-value will be used for further calculations.

The results are represented in histograms or plots in the form of growth curves, age and length structures as well as plots representing maturity stage.

The overall fish biomass of the lakes is estimated with a scientific echo sounder (SIMRAD EK 60 with a 7°x7° composite split beam transducer). Surveys are conducted exclusively during night hours along zigzag transects three times (autumn to winter) per lake. The acoustic data is analysed with Sonar 5 Pro post-processing software. Based on these data overall fish biomass as well as mean size distribution in 2 cm classes will be calculated.

Owners of fishing rights will be involved in the monitoring programme and provided with yearly data on stocking and harvest. At the end of this monitoring programme profound ecological data sets on the development of age and length structure, maturity and growth of whitefish will be available. Age and length structure can be used to draw conclusions about fishing pressure and reproduction success. Data on age and length at maturity allow verification of the used mesh size and/or of the existing minimum size limit. Based on the data of growth and condition factor changes in food supply and problems with dense populations can be derived.

Moreover, after the study has been completed, data on the overall fish biomass will be available for each lake as a basis to size up sustainable yield. A short annual report will be prepared after finishing the yearly surveys and a final report at the end of the study. The final report will contain recommendations how to optimise the fisheries management of the investigated lakes. A short annual report will be prepared after finishing the yearly surveys and a final report at the end of the study. The final report will contain recommendations how to optimise the fisheries management of the investigated lakes.

4. Achievements of Pilot Study 1a – 2017 – 2019 Work Programme

The surveys were done from 2017-2019. The final report was due end of June 2020 and was delivered with only a slight delay due to the COVID-pandemia on 30 September 2020. By mistake, this was omitted in the work programme 2020-2021. Therefore, the achievements are reported here and now.

Eleven fishing surveys in 10 Austrian lakes were carried out. To catch a representative sample of whitefish and lake char, pelagic and bottom nets with different mesh sizes were used. 1347 whitefish, 870 lake chars and 380 „Riedlinge“ were caught using gillnets. „Riedlinge“ are a dwarf form of *Coregonus* sp. which only exists in Traunsee. The envisaged sample size of 100 -200 individuals for whitefish could not be achieved in the following lakes: Attersee, Traunsee and Millstättersee in 2018. Therefore, the survey was repeated in 2019 in Millstättersee. For lake char the number fell below in Traunsee.

The measurement program for the 100 to 150 caught whitefish and lake char included total length, weight, sex, maturity and age of the fish. In some cases, the eggs of maturing females were also extracted to determine fecundity. The fish were measured and weighed immediately after capture. By dissection, sex and maturity were determined using a five-point scale. A logistic regression was used to represent the proportion of sexually mature fish per fish length. This calculation also allowed the determination the fish length at which the majority of fish (75%) were sexually mature.

To determine age, scale samples were taken from the whitefish and otoliths from the lake char. Age determination was performed in the laboratory. Six cleaned and dried scales per whitefish were projected in a double-glass slide frame using a slide projector. The otoliths of the lake char were grinded, fixed in epoxide resin and then transferred to a screen using a stereo magnifier and an eyepiece camera. Using the projected images of the scales or the prepared otoliths, the annual rings could be counted. To avoid misidentification, an independent multiple age reading was always performed by at least two people who did not know the dimensions of the fish.

In total, 169 samples of gonads of mother fish of whitefish and lake char were analysed to examine fecundity. There was a clear link for absolute fecundity between the total length of the mother fish

and the total amount of eggs. Large fish produce disproportionately more eggs than smaller fish. For relative fecundity, this link is roughly reversed: for 100 g biomass smaller fish produce more eggs than larger ones. Huge differences in absolute and relative fecundity were found for both species.

The collected age data and fish lengths were then used to calculate Von Bertalanffy (1938) growth curves for whitefish and lake char in the respective lake. To optimize fishing methodology gillnet fishing effort was determined - The net areas used, the temporal net exposure and the catch success (CPUE - "catch per unit effort"), as well as the selectivity of the mesh sizes were calculated.

The estimation of the fish biomass was carried out with scientific hydroacoustics. Two different devices were used SIMRAD EK 60 and Simrad EK 80. In order to test the comparability between the old and the new instrument, some images were taken with both instruments. While EK 60 worked fine during the recording and analysis, EK 80 caused problems. In close cooperation with the software and device suppliers, it was finally possible to perform recordings and analysis. However, EK 80 overestimated the abundance and thus the total fish biomass above fish lengths of 50 cm. In the meantime, it is known that other research groups also encountered these difficulties which resulted in software updates which still have to be tested on the ground.

In total 613 km were navigated, registered and analysed using EK60 and EK80 during the winter months of 2018/2019 and 2019/2020. The results show a total fish biomass of 1328 tonnes in the ten lakes. The comparison between the lakes shows considerable variability – between 39,5 kg/ha and 180,0 kg/ha. The comparison between EK 60 and EK 80 shows similar length distributions but differences in the fish-biomass distribution. The EK 80 overestimated the number of fish larger than 50 cm resulting in relatively high overall fish biomasses, especially in lakes with a high abundance of larger fish. In lakes with few fish larger than 50 cm there is probably negligible overestimation. There is at least one reference value for the total biomass due to research in the context of implementing the water framework directive within the last twenty years. However, comparisons about the development of fish biomass with these limited data are difficult as the sonar data were collected within a time interval of 15 years.

The study showed that there were overfished and underfished stocks, inefficient minimum catch sizes and lacking catch statistics. The fisheries managers for each lake received a report containing the results and recommendations for future management. The recommendations referred to recommended catches, minimum catch sizes, catch data, restocking measures and surveys. The fisheries managers were not always aware about the status of their stocks. The study provided important groundwork to fill these gaps.

The study and the ten individual reports for the ten lakes investigated can be fully read in [German](#) and a more extensive summary was provided to the European Commission due to their request for pilot studies' summaries on 15 March 2021.

5. Incorporation of results from pilot study into regular sampling by the Member State.

Not applicable – till now there is no regular sampling in the lakes of landlocked countries.

Pilot Study 1b: Fish stock evaluation in the southern part of Lake Neusiedl

General comment: This box fulfils paragraph 4 of Chapter V of the multiannual Union programme and Article 2 and Article 4 paragraph (3) point (a) of the Decision (EU) 2016/1701.

General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study.

1. Aim of pilot study

The southern part of Lake Neusiedl is an important part of the national park Neusiedler See – Seewinkel in Burgenland. Research projects and monitoring during the last years have mainly used net fishing and electro-fishing methods to evaluate the fish community of the lake. While these methods provided good data on species composition and spatial-temporal distribution of fish in Lake Neusiedl, the biomass of the open lake zone is largely unknown. Irregular attempts to get biomass data by using echo-sounding revealed rather the methodological difficulties associated with this method rather than provide reliable quantitative stock estimates.

The aim of the project is to accompany local fishermen on a unique and exceptional fishing campaign in the southern part of the lake to gain information on total biomass of fish and relative proportions of dominant fish species. The campaign has to be embedded in the monitoring and research concept of the national park. The data shall contribute to the fish-ecological monitoring and deepen our understanding of the aquatic communities in the national park.

2. Duration of pilot study

The fishing campaign shall take place in late autumn at low water temperatures. Depending on logistic and technical issues, this can be in autumn 2019 or autumn 2020. Therefore the duration is set as October 2019–February 2021 (including time for data analysis and reporting).

3. Methodology and expected outcomes of pilot study

The fishing campaign itself is fully organised by local fishermen who will use fish trawling to catch the fish. The fish-ecological part covered by this project concentrates on monitoring and supervision of the fishermen in the field, evaluation of the methodology, documentation of the spatial distribution (GPS) of the fish trawls, identification of fish, and measurement of length and biomass. Depending on the catch, age determination will be carried out by counting annual traces on polished opercula. The data analysis and reporting will consider comparable investigations and scientific papers from other large shallow lakes.

4. Achievements of Pilot Study 1b – 2020 – 2021

The originally expected results have not yet been achieved due to the postponement. Basically, it must be stated that trawling net fishing can only be carried out within a very short time window in late autumn or early winter. If the temperatures are too warm, the fish are too mobile in the shallow water and can escape relatively easily. If the freezing point is reached, work becomes almost impossible due to the formation of ice and the cold. In 2019, the late approval of the funding application led to the fishing campaign being postponed. According to the professional fishermen, fishing in winter 2019 could not be carried out due to the cold and weather conditions. The unexpected developments of the corona pandemic led to several meetings in the run-up to the planned fishing campaign in autumn 2020. On October 25th there was a meeting with the leading professional fishermen in Eisenstadt. Possible options for carrying out the fishing campaign were discussed. Due to the lockdown in November, the professional fishermen decided against the implementation of the 2020 campaign. The decisive factor for the decision was the old age of the people involved. Due to the work on the fishing boats, it is not possible to maintain a minimum distance. Overall, the risk of fishing was considered too high.

5. Incorporation of results from pilot study into regular sampling by the Member State.

Due to the postponed fishing campaign, there are currently no results that could be taken into account in the regular sampling. The recording of the fish community and their fish biomass in the open water of the lake by means of traction nets (with scientific supervision) represents a new and so far untested approach. Conventional and standardized fish-ecological survey methods reach their limits when surveying large fish species, such as the European catfish underestimate the total stock.

In addition, this is not applicable as till now there is no regular sampling the lakes of landlocked countries.

SECTION 1: BIOLOGICAL DATA

Text Box 1E: Anadromous and catadromous species data collection in fresh water

General comment: This box fulfills paragraph 2 points (b) and (c) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2 of the Implementing Decision (EU) 2016/1701 on the format of the WP.

General comment: This box is applicable to the Annual Report.

Quote from the 2020-2021 Work Programme: “Austria has no relevant stocks for Anadromous and Catadromous species in Austrian fresh water. For details see Austrian DCF Report 2018”.

According to a decision by the Commission (2008/292/EC) the Black Sea and the river systems connected to it which include the Danube basin do not constitute a natural habitat for European eel for the purposes of Regulation (EC) No 1100/2007. Thus, Austria is not obliged to develop and implement eel management plans and collect data on eels.

SECTION 1: BIOLOGICAL DATA

Text box 1F: Incidental by-catch of birds, mammals, reptiles and fish

General Comment: This box fulfils paragraph 3 point (a) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910, on the multiannual Union programme; and Article 2 of the Implementing Decision (EU) 2016/1701 on the format of the WP. This box is applicable to the Annual Report. This box is applicable only for those sections where Member States have reported that they have been carrying out regular sampling. Results and deviations for Pilot studies should be reported under Pilot Study 2.

Not applicable as Austria is a land-locked country.

SECTION 1: BIOLOGICAL DATA

Pilot Study 2: Level of fishing and impact of fisheries on biological resources and marine ecosystem

General comment: This Box fulfils paragraph 3 point (c) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2 and Article 4 paragraph (3) point (b) of the Implementing Decision (EU) 2016/1701 on the format of the WP.

General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study.

Quote from the 2020-2021 work programme: No sampling for biological data at sea - Austria is a landlocked country.

Not applicable as Austria is land-locked-country.

SECTION 1: BIOLOGICAL DATA

Text Box 1G: List of research surveys at sea

General comment: This box fulfills Chapter I of the Annex of the Implementing Decision (EU) 2019/909, on the list of mandatory surveys and thresholds, of the multiannual Union programme; and Article 2 and Article 7 paragraph (3) of the Decision (EU) 2016/1701 on the format of the WP. It is intended to specify which research surveys at sea set out in the multiannual Union programme will be carried out. Member States shall specify whether the research survey is included in Chapter I of the Annex of the implementing decision of the multiannual Union programme or whether it is an additional survey.

General comment: This box is applicable to the Annual Report. This box should provide complementary information on the performance of the surveys, the results and their main use.

Quote from the 2020-2021 Work Programme: no research surveys at sea - Austria is a landlocked country.

Not applicable as Austria is a land-locked country.

SECTION 2: FISHING ACTIVITY DATA

Text Box 2A: Fishing activity variables data collection strategy

General comment: This box fulfills paragraph 4 of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2, Article 4 paragraph (2) point (b) and Article 5 paragraph (2) of the Implementing Decision (EU) 2016/1701 on the format of the WP. It is intended to describe the method used to derive estimates on representative samples where data are not to be recorded under Regulation (EU) No 1224/2009 or where data collected under Regulation (EU) No 1224/2009 are not at the right aggregation level for the intended scientific use.

General comment: This box is applicable to the Annual Report. This box should provide information on the implementation of the data collection of fishing activity variables of Member States.

Quote from the 2020-2021 Work Programme:: Not applicable - no fishing activity above threshold

Not applicable as Austria is a land-locked country.

SECTION 3: ECONOMIC AND SOCIAL DATA

Text Box 3A: Population segments for collection of economic and social data for fisheries

General comment: This box fulfils paragraph 5 points (a) and (b) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2, Article 4 paragraphs (1), (2) and (5) and Article 5 paragraph (2) of the Implementing Decision (EU) 2016/1701 on the format of the WP. It is intended to specify data to be collected under Tables 5(A) and 6 of the delegated decision on the multiannual Union programme.
General comment: This box is applicable to the Annual Report. This box should provide information on the implementation of the fleet socio-economic data collection of Member States.
Quote from the 2020-2021 Work Programme : Not applicable - no fishing activity above treshold
Not applicable as Austria is a land-locked country.

SECTION 3: ECONOMIC AND SOCIAL DATA

Pilot Study 3: Data on employment by education level and nationality

General comment: This box fulfils paragraph 5 point (b) and paragraph 6 point (b) of Chapter III of the Annex Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2 and Article 4 paragraph (3) point (c) of the Implementing Decision (EU) 2016/1701 on the format of the WP. It is intended to specify data to be collected under Table 6 of the delegated decision on the multiannual Union programme.
General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study (including deviations from planned and justifications as to why if this was not the case).
Quote from the Work Programme 2020-2021: Not applicable
Austria is under the 1%-threshold for aquaculture production both for volume and value. We used data from Eurostat for volume. Austria's aquaculture production in 2018 was 4084 tonnes which represents 0,31% of the amount for the EU. As Eurostat does not provide complete date for value, we used EUMOFA's „EU Fish Market Report 2020“ which contains data for 2018. The value of Austria's aquaculture production was 25,57 million € which represents 0,53% of the amount for the EU. However, for the results of Pilot Study 3a “Socio-economic data in the fisheries and aquaculture sectors in Austria” please see pages 13-16.

Pilot Study 3a: Socio-economic data in the fisheries and aquaculture sectors in Austria

General comment: This Box fulfills paragraph 5 points (a) and (b) of Chapter III of the Delegated Decision on the multi-annual Union programme. It is intended to specify data to be collected under Tables 5(A) and 6 of the Delegated Decision on the multi-annual Union programme..

Proposal for a second pilot study on collecting and/or possibilities for collecting socio-economic data in the Austrian fisheries and aquaculture sectors

1. Aim of pilot study

Due to low data availability, little is known about the Austrian aquaculture sector from a socio-economic point of view. The first Austrian pilot study (pilot study 3a 2017-19) on the collection of socio-economic data in domestic fisheries and aquaculture was a step towards a better understanding of the sector's socio-economic situation and towards improved data. This knowledge and database should now be used efficiently.

Based on the results of pilot study 3a (2017-19), the method of a possible branch-tailored data collection, should be further developed. The heterogeneity of the sector and the low availability of data on operating characteristics lead to high variances in the statistical extrapolations. Therefore, data collection using the statistical method introduced in the first pilot study would require very large samples (depending on the variable) to achieve the required accuracy. The achievement of these sample sizes in combination with comprehensive standardized surveys is considered to be highly unlikely, since especially the large number of small businesses would face a disproportionate effort. As a result, low response rates and limited data quality could be expected.

Virtual data sets on so-called representative farms in the sector could remedy this situation and directly tie in with the work of the first socio-economic pilot study. This approach serves to reduce the bureaucratic workload for fish farms resulting from broad surveys and at the same time serves to increase the quality of the data through the detailed mapping of fewer but more representative farms.

The objectives of the new Pilot Study 3a are therefore

- the modeling of socio-economic variables of representative trout and carp farms,
- the statistical projection of the representative farms on the corresponding segment level and
- the further methodological development as a basis for a possible branch-tailored data collection

2. Duration of pilot study

The pilot study is planned for 12 month.

3. Methodology and expected outcomes of pilot study

Based on the results of pilot study 3a 2017-19, the next step is the development of a simplified data generation approach. For this purpose, representative model companies are generated on a microeconomic level: Based on existing empirical data and in collaboration with sector's and statistics' experts, virtual data sets are created for representative companies. Socio-economic variables are assessed or calculated based on empirical relationships (typical amount of feed used per ton produced, etc.) and validated. Then, the variables are statistically projected (extrapolated) onto the part of the sector represented by the farm, using empirical indicators (e.g., production volume). The results of the first pilot study provide an ideal starting point for developing and testing this approach for Austria.

The approach is based on three pillars:

Existing data:

- Objective: Identification of relevant regions, relevant fish species, relevant production techniques, relevant farm sizes, etc.
- Sources: collected data or administrative data such as aquaculture statistics, business registers, employment statistics, etc.

Focus groups:

- Objective: Definition of representative farms, definition of the variables' values, interpretation of the business context
- Sources: industry representatives and individual companies, scientific experts; based on achieved knowledge from pilot study 3a

surveys:

- Objective: To test and validate the variables and the calculated data on site at individual farms
- Sources: Partially carried out in pilot study 3a, this preparatory work can be used efficiently

In Germany, a pilot study on model farms for aquaculture is currently being carried out. Therefrom, important synergy effects can be expected.

The required data are the variables of Tables 6 and 7, with segmentation acc. Table 9 of the Annex to the Union program for the collection, management and use of data in the fisheries and aquaculture sector 2017-19. The possibility of including the environmental variables (Table 8) should be examined.

Data that are difficult to gather at individual farm level could be determined on the basis of this approach. The results will then be linked to the statistical models of pilot study 3a. This is expected to provide more explanatory variables that can be used for the linear model, resulting in less variance and thus being a significant improvement for the extrapolation of the socio-economic data on farm-level to the overall sector.

In addition to information on the current economic performance, socio-economic data also serve to analyze the long-term economic development of the aquaculture sector, as well as the impact of policies and the impact of operational measures such as investment or changes in production processes. The results of pilot study 3a could be used to support policy makers to derive sound policy recommendations for the sector. Socio-economic knowledge of a sector is an essential foundation for knowledge of measures' impact and targeting.

4. Achievements of Pilot Study 3a

The Pilot Study is still under elaboration. Therefore, no outcomes nor recommendations can be reported yet.

After screening the literature, a data check was carried out to determine which variables in Table 6 and Table 7 of the Annex to the Commission's Implementing Decision are contained in the used typical farm approach survey tool of the agri benchmark Fish network. Overall, the survey tool offers a comprehensive opportunity to cover the socio-economic variables (see tables). As already shown in the first Pilot Study (2017-2019), there are also administrative data sources which cover some of the variables.

Social variables

Variable	Availability in the typical farm approach survey tool or alternative option
Employment by gender	Included in survey tool
FTE by gender	Can be determined using survey tool
Unpaid labour by gender	Can be determined using survey tool
Employment by age	Survey tool can be expanded to include variable

Employment by education level	Survey tool can be expanded to include variable	
Employment by nationality	Survey tool can be expanded to include variable	
Employment by employment status	Can be determined using survey tool	
FTE National	Survey tool can be expanded to include variable	
<i>Economic variables</i>		
Variable group	Variable	Availability in the typical farm approach survey tool or alternative option
Income	Gross sales per species	Included in survey tool
	Other income	Included in survey tool
Personnel costs	Personnel costs	Included in survey tool, except for position “in-kind benefits” (survey tool can be expanded)
	Value of unpaid labour	Basis is included in survey tool; calculation can be carried out using average hourly rate for the industry and annual work units from the Agricultural and Forestry Register
Energy costs	Energy costs	Included in survey tool
Raw material costs	Livestock costs	Included in survey tool
	Feed costs	Included in survey tool
Repair and maintenance	Repair and maintenance	Included in survey tool
Other operating costs	Other operating costs	Included in survey tool
Subsidies	Operating subsidies	Included in survey tool
	Subsidies on investments	Included in survey tool; additional source: EMFF funding data
Capital costs	Consumption of fixed capital	Included in survey tool
Capital value	Total value of assets	Can be determined using survey tool
Financial results	Financial income	Survey tool can be expanded to include variable
	Financial expenditures	Included in survey tool
Investments	Net Investments	Not included in survey tool; Alternative: calculation based on EMFF funding data
Debt	Debt	Included in survey tool
Raw material weight	Livestock used	Included in survey tool

	Fish Feed used	Included in survey tool
Weight of sales	Weight of sales per species	Included in survey tool
Employment	persons employed	<i>(see table above)</i>
	Unpaid labour	<i>(see table above)</i>
	Number of hours worked by employees and unpaid workers	<i>(see table above)</i>
Number of enterprises	Number of enterprises (by category on the number of persons employed)	Not included in survey tool; Alternative: - number of aquaculture companies by NACE (Labour Market Database; Business Register) - number of aquaculture producers without NACE, (Aquaculture Production Statistics) - number of approved aquaculture companies (Aquaculture Register) no breakdown by number of employees

In a further step, relevant typical farm specifics were defined based on production data. The Pilot Study aims to set up four typical farms (two carp and two trout production sites), which would represent a considerable share of overall Austrian production. Based on the typical farm approach, further insights on causal relationships shall be used to gather more explanatory variables for the data extrapolation method used in the previous Pilot Study 3 (2017-2019), to receive better standard deviations when extrapolating survey data and calculating the variable values for the entire Austrian federal territory. Unfortunately, the range of further explanatory variables based on the approach is limited.

In the first months of the project, desk research, data processing and exchange with experts were carried out as planned and without delay. The first focus group (carp) took place in a personal meeting setting, in line with official Covid-requirements. The on-site carp farm visits, which serve to verify the information gathered in the focus group, were carried out as planned. Nevertheless, the Covid-19 pandemic created major challenges for the Pilot Study. The second focus group (trout) was already planned, but due to rising numbers of Covid infections and the accordingly changed national Covid-regulations (no personal meetings possible), this focus group had to be postponed. Currently, the regulations are still in place. An online format is not suitable for typical farm focus groups, as this would not provide the needed discussion setting and would be disadvantageous for the outcome. The implementation period of the pilot study was initially scheduled for 12 months (April 2020 – March 2021). Due to the Covid-19 pandemic and the necessary measures, the Pilot Study is extended until September 2021. Depending on the development of the national Covid-regulations, extending the Pilot Study until December 2021 might be necessary.

5. Incorporation of results from pilot study into regular sampling by the Member State.

The second Pilot Study 3a is still under elaboration. Therefore, no outcomes nor recommendations can be reported yet. In general, no regular sampling is currently planned in Austria, apart from national legal requirements. Applying the typical farm approach as part of a comprehensive data sampling / mixed method approach requires setting up a network of typical farms, representing the Austrian sector. Therefore, increasing the number of typical farms would be necessary to sufficiently cover the sector

SECTION 3: ECONOMIC AND SOCIAL DATA

Text Box 3B: Population segments for collection of economic and social data for aquaculture

General comment: This box fulfills paragraph 6 points (a) and (b) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2, Article 4 paragraphs (1) and (5) and Article 5 paragraph (2) of the Implementing Decision (EU) 2016/1701 on the format of the WP. It is intended to specify data to be collected under Tables 6 and 7 of the delegated decision on the multiannual Union programme.

General comment: This box is applicable to the Annual Report. This box should provide information on the implementation of the socio-economic data collection for aquaculture of Member States.

Quote from the 2020-2021 Work Programme: Not applicable. – Austria is looking by means of the second pilot study 3a for methodologies and data sources for the collection of economic and social data for aquaculture.

Austria is under the 1%-threshold for aquaculture production both for volume and value. We used data from Eurostat for volume. Austria's aquaculture production in 2018 was 4084 tonnes which represents 0,31% of the amount for the EU. As Eurostat does not provide complete data for value, we used EUMOFA's „EU Fish Market Report 2020“ which contains the most recent available data, namely data for 2018. The value of Austria's aquaculture production was 25,57 million € which represents 0,53% of the amount for the EU.

However, for the results of Pilot Study 3a “Socio-economic data in the fisheries and aquaculture sectors in Austria” please see pages 13-16.

Pilot Study 4: Environmental data on aquaculture

General comment: This box fulfills paragraph 6 point (c) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2 and Article 4 paragraph (3) point (d) of the Implementing Decision (EU) 2016/1701 on the format of the WP. It is intended to specify data to be collected under Table 8 of the delegated decision on the multiannual Union programme.

General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study (including deviations from planned and justifications as to why if this was not the case).

1. Aim of pilot study

Under pilot study 4, a further pilot study for "Identification of the aquaculture potential in focus areas (sub-basins) based on environmental data" is foreseen.

Regarding environmental data on aquaculture (i.e. variables "mortalities" and "medicines or treatments administered"), one aspect of pilot study 3a is to examine the possibility of including the environmental variables in the examined method (see text box 3a).

2. Duration of pilot study

12 months

3. Methodology and expected outcomes of pilot study

Austria is a country with rich water resources that can support aquaculture in a sustainable way. However, since the magnitude of the future aquaculture is hard to assess and depends on multiple aspects, new methodological approaches are required. A first country-wide assessment of the aquaculture potential for salmonid species was finished in September 2019 within the DCF sub-pilotstudy 4 aquaNovum. By combining data on environmental conditions, existing uses, legal restrictions and risks areas with a high production potential for trout farming were identified. While aquaNovum aimed for assessing the general aquaculture potential on a national level, local parameters as e.g. the ownership structure, mutual interferences between potential facilities and economic aspects could not be considered.

Therefore, this pilot project shall now incorporate those aspects on a site-scale for previously identified focus areas. Furthermore, the need for more detailed data with regard to the availability and quantity of suitable water resources, especially under consideration of climate change (e.g. low flow, water temperature) was raised and should be addressed. Furthermore, a site prioritisation approach should be developed to select the most promising production sites under consideration of potential mutual interferences.

The data collected, processed and combined in aquaNovum represent an important data-base for practitioners and decision makers in the aquaculture sector and should be further extended. Several requests for a web-based tool including individual thematic data layers were raised and highlight the importance for data-driven decision making. However, since the collected data were provided by different sources are highly restricted with regard to their rights of use one work package should elaborate how to make these results available to interested users.

Methodology regarding environmental variables:

The possibility of collecting the environmental variables ("mortalities" and "medicines or treatments administered") will be examined in pilot study 3a, by including them in the described method.

Thereby, representative model farms are set up to gather virtual farm data, as the first applied method of survey sampling and extrapolation* does not result in valid data, due to the heterogeneity of the sector. Using existing data, focus groups and survey data, virtual data sets are created on a micro-level. Then, the variables are statistically projected (extrapolated) onto the part of the sector represented by the farm, using empirical indicators (e.g., production volume).

*Result of the first pilotstudy 4 of the Austrian MAP 2017-19.

4. Achievement of the original expected outcomes of pilot study and justification if this was not the case.

In 2020, the required data were collected and combined in a GIS-based model. In turn of the data collection process meetings were held to discuss the possibilities how the data can be used and shown in the planned web-based tool. Final decisions on this topic are pending and will be made in 2021. Furthermore, a first version of the web-based tool was designed. The draft version was presented and discussed in an online-stakeholder workshop in September 2020 to support the further development of the tool. Unfortunately, the workshop had to be held in an online format due to COVID19-restrictions. In order to compensate for personal exchange during the workshop, participants were asked to answer two online surveys, whereby one focused on the overall methodology of aquaZoom and one on the web-based tool. The results of this workshop were summarized in a national report. Within 2021, the feedback provided by the stakeholders will be incorporated in the methodology how trout-based fish production potential will be assessed as well as into the web-based tool. The functionality of the tool will be further extended and a final decision in which form the tool can be made available to stakeholders will be taken. The project is currently ongoing until December 2021.

Regarding environmental variables:

Environmental variables “medicines or treatments administered” and “mortalities”: Research showed that unfortunately there are no administrative central data sources from which possible future data collection obligations could be met. So, for these two environmental variables a simplified methodology is currently examined: the *typical farm approach* is developed and applied for the first time for the Austrian aquaculture sector, including the evaluation, if the environmental variables could be generated by this approach. Although the underlying survey instrument of the agri benchmark Fish network does not cover the environmental variables specified in the current EU MAP, the survey tool can be expanded to include these variables. Overlapping with Pilot Study 3, we aim to cover four typical farms (two carp production sites and two trout production sites), which would represent a considerable share of the overall Austrian production. The Covid-19 pandemic created relevant challenges for the approach, as the second focus group (trout) had to be postponed due to national Covid-regulations. Currently, the regulations are still in place (no personal meetings possible). An online format is not suitable for holding typical farm focus groups, as this would not provide the needed discussion setting and would be disadvantageous for the outcome. Due to the Covid-19 pandemic and the necessary measures, the work on the methodology is extended until September 2021. Depending on the development of the national Covid-regulations, an extension until December 2021 might be necessary. For these reasons, the methodology regarding the environmental variables is still under elaboration and no final outcomes nor recommendations can be reported yet. A preliminary result for carp production only for the year 2020 is shown in the following table:

Variable	Specification	Unit	Result
Medicines or treatments administered	By type	Gram	0
Mortalities		Per cent	35

A specification of medicines/treatments by type is not necessary due to the result of zero.

5. Incorporation of results from pilot study into regular sampling by the Member State.

Since this project is not related to a sampling routine an incorporation of results in the national sampling routine is not applicable. However, the developed tool could be regularly updated and therefore provide long-term support for practitioners and administrative authorities to gather information about the production potential.

Rgarding environmental variables:

The pilot study is still under elaboration. Therefore, no outcomes nor recommendations on the incorporation of results can be reported yet. As it is expected that the environmental variables “medicines or treatments administered” and “mortalities” will not be part of the new EU MAP, there will most likely not be any further data collection regarding these variables, as it is not a national requirement.

SECTION 3: ECONOMIC AND SOCIAL DATA

Text Box 3C: Population segments for collection of economic and social data for the processing industry

General comment: This box fulfils footnote 6 of paragraph 1.1(d) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2, Article 4 paragraphs (1) and (5) and Article 5 paragraph (2) of the Implementing Decision (EU) 2016/1701 on the format of the WP. It is intended to specify data to be collected under Table 10 of the delegated decision on the multiannual Union programme.

General comment: This box is applicable to the Annual Report. This box should provide information on the implementation of the socio-economic data collection for aquaculture of Member States.

Quote from the 2020-2021 Work Programme: Not applicable – no collection of economic and social data for the processing industry is planned for 2017-2019. The period 2017- 2019 is apparently a mistake which was overlooked. It should read 2020-2021.

No work was foreseen in the 2020-2021 WP.

SECTION 4: SAMPLING STRATEGY FOR BIOLOGICAL DATA FROM COMMERCIAL FISHERIES

Text Box 4A: Sampling plan description for biological data

General comment: This box fulfills Article 3, Article 4 paragraph (4) and Article 8 of the Implementing Decision (EU) 2016/1701 on the format of the WP and forms the basis for the fulfilment of paragraph 2 point (a)(i) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme. This Table refers to data to be collected under Tables 1(A), 1(B) and 1(C) of the delegated decision on the multiannual Union programme.

General comment: This box is applicable to the Annual Report. This box should provide information on the deviations from the planned sampling of Member States.

Quote from the Work Programme 2020-2021: Not applicable – no data sampling for biological data necessary.

Not applicable as Austria is a land-locked country.

SECTION 5: DATA QUALITY

Text Box 5A: Quality assurance framework for biological data

General comment: This box is applicable to the Annual Report. This box fulfills Article 5 paragraph (2) point (a) of the Implementing Decision (EU) 2016/1701 on the format of the WP. This box is intended to specify data to be collected under Tables 1(A), 1(B) and 1(C) of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme. Use this box to provide additional information on Table 5A of the Annual Report.

Not applicable as Austria is a land-locked country.

SECTION 5: DATA QUALITY

Text Box 5B: Quality assurance framework for socioeconomic data

General comment: This box fulfills Article 5 paragraph (2) point (b) of the Implementing Decision (EU) 2016/1701 on the format of the WP. This box is intended to specify data to be collected under Tables 5(A), 6 and 7 of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme. Use this box to provide additional information on Table 5B of the Annual Report.

Austria is under the 1%-threshold for aquaculture production both for volume and value. We used data from Eurostat for volume. Austria's aquaculture production in 2018 was 4084 tonnes which represents 0,31% of the amount for the EU. As Eurostat does not provide complete data for value, we used EUMOFA's „EU Fish Market Report 2020“ which contains the most recent available data,

namely data for 2018. The value of Austria's aquaculture production was 25,57 million € which represents 0,53% of the amount for the EU.

General information:

Sector: Aquaculture

Data collection scheme: typical farm approach, administrative data

There were no changes in data quality assurance.

As it was recommended by the first socio-economic Pilot Study to strive for surveys with longer time intervals and sound interpolation, the now ongoing Pilot Study focuses on a simplified methodology for data interpolation by the so called typical farm approach. The typical farm approach represents a data acquisition strategy for key figures and operational indicators of agricultural companies based on model farms. It does not generate empirical, but empirically grounded 'virtual' data for sector-typical, representative farms. This approach encompasses different agricultural production systems, including aquaculture (Lasner et al. 2017). The methodology is used for agricultural data analysis by statistical and research institutions (Langrell et al. 2012).

The typical farm approach concept relies on diverse sources for pre-defining the selected case (statistics, reports etc.), the proof of the cases' characteristics is empirical. The focus group-based data generation is validated via a) double-check to real existing farms and to existing knowledge and b) control functions by the variables within the model farms (e.g. the FCR should meet the volume of feed used and the feed costs should be in line with the feed volume and the feed price etc.), which guarantees a sound and intense inclusion of the affected stakeholder groups (Lasner 2020).

References:

- Langrell, S., et al. (2012): Sustainability and Production Costs in the Global Farming Sector: Comparative Analysis and Methodologies. JRC Scientific and Policy Reports.
- Lasner, T., et al. (2017) Establishing a benchmarking for fish farming – Profitability, productivity and energy efficiency of German, Danish and Turkish rainbow trout grow-out systems. Aquaculture Research, 2017, 48.
- Lasner, T., et al. (2020): Carp land: Economics of fish farms and the impact of region-marketing in the Aischgrund (DEU) and Barycz Valley (POL). Aquaculture, 519.

2. Section P3 Impartiality and objectiveness

The Pilot Study is still under elaboration, which is why some of the issues are not applicable. This is the case for error checking and fixing, as no data is yet available/published.

3. Section P4 Confidentiality

No other DCF partners are involved, therefore the issue is not applicable. There are no constraints as consequence.

4. Section P5 Sound methodology

The used methodology of the Pilot Study is sound and based on a professional, yet simplified, method (see literature above). The applied methodology is documented and will be available in the final project report. To our knowledge, apart from Germany, no other MS has yet implemented the typical farm approach (i.e. representative farms) as (supporting) part of the data collection.

5. Section P6 Appropriate statistical procedures

The statistical procedures applied will encompass an extrapolation of the expected values at sector level by means of a stratified random sample and linear models (best fitting model chosen for each variable), building on the survey results for the first Pilot Study, checking for a better fitting of the model if additional explanatory variables from the typical farm approach are used. Final information on the effectiveness and suitability will be available when the Pilot Study is completed.

6. Section P7 Non-excessive burden on respondents

The focus groups consist of max. 12 people which means that the required resources of the sector are considerably lower compared to, e.g., a direct survey.

7. Section P8 Cost effectiveness

As there are no direct surveys planned in the years of interpolation, cost effectiveness is therefore comparatively higher. 9k

8. Section P9 Relevance

So far, there are no potential end users known other than those of EU MAP data. Therefore, no constraints are expected. Final information on the potential end users will be available when the Pilot Study is completed

9. Section P10 Accuracy and reliability

The Pilot Study is still under elaboration and there is no continuous data collection, which is why some of the issues are not applicable. This is the case for assessment, validation and error measurement/documentation, as no data is yet available/published. Error documentation and fixing takes place as inherent part of the Pilot Study. Data quality checks are currently done by consulting sectors representatives and experts. Final information on accuracy and reliability will be available when the Pilot Study is completed.

10. Section P11 Timeliness and punctuality

Final information on timeliness and punctuality will be available when the Pilot Study is completed. The Covid-19 pandemic created major challenges for the Pilot Study (second focus group postponed). Therefore, the Pilot Study is extended until September 2021 (extending until December 2021 might be necessary).

11. Section P12 coherence and comparability

The Pilot Study is still under elaboration and there is no continuous data collection, which is why some of the issues are not applicable: As this methodology is not used by member states for data collection under EU MAP (apart from Germany, apparently as supporting part of their data collection), comparability with other member states cannot be accomplished. Coherence and comparability among typical farms within Austria will be possible when the Pilot Study is completed and - to a larger extent - if more typical farm are generated in the future.

12. Section P13 Accessibility and Clarity

For the administrative data, methodological documents are available, but mostly not publicly. General information on the data bases/data providers can be found here:

- <https://arbeitsmarktdatenbank.at/>
- <https://services.ama.at/servlet/>
- https://www.statistik.at/web_de/statistiken/wirtschaft/land_und_forstwirtschaft/viehbestand_tierische_erzeugung/aquakultur/index.html

The results of the Pilot Study as well as the description of the used methodology will be publicly accessible and described in detail in the final project report.