

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**

## **2021**

Vienna, 25 May 2022

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## 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 fulfills 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 WP 2020-2021: Not applicable as Austria is a land-locked country.

No work was foreseen in the WP 2020-2021.

## SECTION 1: BIOLOGICAL DATA

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

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.

#### 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

Due to covid-19 restrictions the campaign had to be postponed and took place in late autumn 2021 at low water temperatures. Therefore the duration was October 2019 – February 2022 (including time for data analysis and reporting).

This report presents the results of the 2021 trawlingnet campaign in the southern and northern parts of Lake Neusiedl and compares them with the results of the 2010 and 2014 campaigns. The focus was on the development of European Catfish (*Silurus glanis*) populations in the southern and northern parts and how the population of adult fish of the most common large fish species developed.

Fishing in the southern part took place on November 15th and 16th and December 14th with five boats, which carried out a total of 54 net pulls over a total area of 110 hectares. The fishing in the northern part also took place on December 15 with five boats, which carried out 26 net pulls on an area of 53 ha. The fish population was determined on the basis of catches and taking into account the fished area and standardized to ind./ha and kg/ha. The fish cenosis of Lake Neusiedl includes 19 autochthonous species. During the 2021 trawlingnet campaign, 7 of the 19 species were detected in the southern part and 5 species in the northern part. The mesh size of 50 mm resulted in a high selectivity of adult fish. Small fish species, juvenile and subadult stages were

not considered for methodological reasons. Volga Zander (*Sander volgensis*) and Sicling (*Pelecus cultratus*) were only found in the southern part.

A total of 2743 individuals with a biomass of 5157 kg were caught in the southern part. The most common fish species were bream and catfish, with catfish being dominant with 4490 kg and 1107 individuals. In the northern part 2283 individuals with a biomass of 624 kg were caught, dominated by bream (*Abramis brama*) and Prussian carp (*Carassius gibelio*). Taking into account the fished area, an individual density of 25.5 ind./ha with a biomass of 47.6 kg/ha was calculated for the southern part, of which 10.2 ind./ha and 41.4 kg/ha catfish. In the northern part, stock values of 43.0 Ind./ha and 11.7 kg/ha were calculated, with the catfish showing 1.3 ind./ha and 1.2 kg/ha.

During earlier trawlingnet campaigns in 2010 and 2014, very high catfish biomasses were caught in the southern part. The 2021 results were the highest catfish catches of the three campaigns - in relative terms 87% of the fish biomass caught was catfish. In 2010, by comparison, 70% of the biomass was catfish. At the same time, a declining trend can be seen for the other fish species over the three campaigns.

While the campaign should be restricted to the Southern part of the lake, it was possible to extend the programme without additional costs and include a campaign in the Northern part of the lake.

A comparison of the data with fish stocks from other shallow lakes, as previously planned, turned out to be less meaningful as expected because of the specific nature and character of lake Neusiedl as well as for methodological reasons. However, stock data from previous years in Lake Neusiedl were obtained and could be compared with the current results. Very high catfish biomass were found in the Southern part already during earlier trawlingnet campaigns in 2010 and 2014. The 2021 results, however, were the highest catfish catches of all three campaigns. whereas catfish comprised 70% of the total fish biomass in 2010, it was 87% in 2021. At the same time, a declining trend can be seen for the other fish species over the three campaigns.

An evaluation of the population structure of the dominant species was originally planned using annual traces on polished opercula. The large amount of fish justified to adapt the programme and base the population structure on length-frequency analyses, the Peterson method (indirect age determination), which were carried out separately for the Southern and Northern part of the lake and for all species caught.

Due to the large number of catfish caught in the southern part and the high number of by-catches in the northern part, indirect age determination was preferable to direct age determination via otoliths or opercula. The original monitoring program was significantly expanded through the expansion of the site at no additional cost. This required adjusting the age determination of the fish.

Determining the age of fish via opercula and otoliths is a lethal method. Since by-catches are moved back, the originally chosen method of direct age determination had to be adapted. Indirect age determination using length frequencies according to Peterson is suitable for this.

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

There is no legal obligation to collect data on fish populations in lakes of land-locked countries under the DCF-regulation. However, ecological fish monitoring is carried out using gill-net fishing in the open water zone and electro-fishing in the littoral zone along the reed belt in 6- to 10-years intervals in addition to other scientific projects under the national park research programme. Trawling has not been part of the monitoring so far. As a follow-up of the actual project, new proposals for the fish-ecological monitoring of Lake Neusiedl will include the option of trawling in co-operation with local fishermen, as the method has proven highly effective. It is the only method which provides sound data on biomass of large fish from the open lake. Intensified cooperation with professional fishermen to survey the fish stocks in the open water of Lake Neusiedl is an important objective for fish-ecological monitoring in the future.

## 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 WP 2020-2021: Not applicable, 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 fulfills 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 WP 2020-2021: No sampling for biological data at sea- Austria is a land-locked country.

Not applicable as Austria is a 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 WP 2020-2021: not applicable – no fishing 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 WP 2020-2021: not applicable – no fishing activity above threshold.
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 WP 2020-2021: Not applicable
According to Commission Implementing Decision EU/2019/909 Chapter II para “5 No social and economic data on aquaculture need to be collected if the total production of the Member State is less than 1 % of the total Union production volume and value.  Eurostat reports for Austria in 2019 4.250 tonnes of production with a value of 29,65 million €. Eurostat provides incomplete data for the EU’s aquaculture production in 2019 when the UK was still a member of the EU. Therefore, EUMOFA’s “The EU Fish Market Report 2021” which contains data for 2019 was used. 1,27 million tons were produced with a value of 4,99 billion €.  Using these figures, Austria’s aquaculture production in 2019 was 0,31% of the overall EU production in volume and 0,60% in value.  However, for the results of pilot study “Socio-economic data in fisheries and Aquaculture sectors in Austria” please see pages 11-14.

## SECTION 3: ECONOMIC AND SOCIAL DATA

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

General comment: This box fulfills 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).

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

After screening the literature, it was checked which variables of Table 6 and Table 7 of the Annex to the Commission's Implementing Decision are contained in the typical farm approach survey tool: overall, the survey tool offers a comprehensive opportunity to cover the socio-economic variables. As already shown in the first Pilot Study 3 part 1 (2017-2019), there are also administrative data sources which cover some of the variables.

Three typical farms were created using the Typical Farm Approach: Two carp farms with an annual production of 4 and 20 tons respectively in the Waldviertel region, and a trout farm with an annual production of 100 tons in the Mattigtal region. The generated data and findings were used to refine the statistical model of Pilot Study 3 – part 1. The analysis shows that the addition of variables and further insights on variable dependencies from the Typical Farm Approach can lead to improvements regarding the standard deviation of certain variables. Furthermore, the integration of expert knowledge, which was gathered during the process of the Typical Farm Approach, additionally contributes to the reduction of the standard deviation of certain variables via the so-called Bayes method.

To analyse the value added by the Typical Farm Approach for the statistical model, three methods were compared:

- Linear model from Pilot Study 3 – part 1 (STD): The explanatory variables “gross sales” and “total weight of sales” were used and the best model per group (species and grow out vs. fingerlings) was applied.
- Extension of the model by the Typical Farm Approach (TFA): Additionally to the explanatory variables “gross sales” and “total weight of sales”, variables gathered through the Typical Farm Approach were used.

- Application of the Bayes estimator (bayes): Expert knowledge gathered through the Typical Farm Approach was used.

All variables were checked, yet the calculation was carried out for those EU MAP variables for which sufficient additional information on correlation was gathered from the Typical Farm Approach. The following tables show the results of the calculations.

Table: Extrapolation without strata: Estimated value (€) and related standard deviation (sd). Column AB indicates in how many groups the Bayes method was applied. €-values rounded to 100.

	STD (€)	STD-sd	TFA (€)	TFA-sd	bayes (€)	bayes-sd	AB
Wages and salaries	8 236 600	24,8%	7 806 300	23,3%	6 206 200	21,2%	2
Imputed value of unpaid labour	6 179 100	14,6%	6 205 600	14,5%	2 542 900	17,7%	2
Energy costs	1 897 500	33,0%	1 898 500	32,9%	1 475 100	16,0%	2
Repair and maintenance	1 834 200	28,9%	2 305 400	22,8%	1 911 400	24,5%	2
Fish feed used	11 600	30,1%	11 800	29,5%	11 700	18,0%	4
Feed costs	6 774 300	42,3%	7 876 000	35,9%	8 062 100	4,7%	4
Unpaid labour	542 400	18,2%	545 400	18,1%	408 100	21,6%	2
FTE	500	14,7%	500	14,6%	500	45,8%	2
Number of hours worked by employees and unpaid labour	953 800	16,3%	954 000	16,3%	1 136 200	71,7%	2

Table: Extrapolation with new strata: Estimated value (€) and related standard deviation (sd). Column AB indicates in how many groups the Bayes method was applied. €-values rounded to 100.

	STD (€)	STD-sd	TFA (€)	TFA-sd	bayes (€)	bayes-sd	AB
Wages and salaries	6 595 600	19,1%	6 740 700	17,8%	5 468 500	14,2%	4
Imputed value of unpaid labour	5 872 100	14,6%	5 877 700	14,5%	2 956 000	19,6%	4
Energy costs	1 590 200	19,3%	1 596 700	18,7%	1 403 700	17,2%	4
Repair and maintenance	1 682 000	26,6%	2 080 300	17,5%	1 551 900	18,0%	4
Fish feed used	11 700	7,3%	12 600	2,9%	12 800	3,4%	8
Feed costs	6 945 600	13,7%	7 916 500	6,8%	7 691 200	4,2%	8
Unpaid labour	480 700	16,3%	488 700	18,0%	448 500	18,4%	4
FTE	400	10,0%	500	9,8%	400	21,7%	4
Number of hours worked by employees and unpaid labour	822 600	10,5%	843 900	10,3%	890 500	10,3%	4

The Covid-19 pandemic caused severe challenges for the approach, as the second focus group (trout production) had to be postponed twice due to national Covid-19-regulations and safety reasons. An online format is not suitable for carrying out focus groups within the Typical Farm Approach, as this would not provide the necessary discussion setting and would be disadvantageous for the outcome. Due to the Covid-19 pandemic and the necessary measures, the Pilot Study 3 was extended until December 2021.

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

As Austrian aquaculture production is below the threshold in volume and value, data collection under the EU MAP framework is not mandatory. Hence, no regular sampling is currently planned by the Austrian administration, apart from national legal requirements.

Should regular data collection and reporting become mandatory for Austria in the future, Pilot Study 3a – part 2 recommends implementing a data collection by means of a "simplified methodology" as a Mixed Methods Approach: The Typical Farm Approach could thereby be expanded gradually, setting up a network of typical farms representing the Austrian sector. In addition, administrative data and survey data (short postal surveys) could be used. The overall data could finally be projected to the sector as a whole, using the revised statistical method of Pilot Study 3a – part.

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

According to Commission Implementing Decision EU/2019/909 Chapter II para “5 No social and economic data on aquaculture need to be collected if the total production of the Member State is less than 1 % of the total Union production volume and value.

Eurostat reports for Austria in 2019 4.250 tonnes of production with a value of 29,65 million €. Eurostat provides incomplete data for the EU’s aquaculture production in 2019 when the UK was still a member of the EU. Therefore, EUMOFA’s “The EU Fish Market Report 2021” which contains data for 2019 was used. 1,27 million tons were produced with a value of 4,99 billion €.

Using these figures, Austria’s aquaculture production in 2019 was 0,31% of the overall EU production in volume and 0,60% in value.

However, for the results of pilot study “Socio-economic data in fisheries and Aquaculture sectors in Austria” please see pages 11-14.

**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.

The expected outcomes have been achieved by the pilot study, i.e. a refinement and advancement of the existing approach from aquaNovum have been successfully incorporated. This includes a more detailed evaluation of aquaculture siting across Austria based on an improved data basis (i.e. refined analyses of already implemented data sets and inclusion of new data), the increase of the spatial resolution of the siting and a better consideration of hydrological conditions relevant to the production volume of potential facilities and the changing hydrological regimes in the future. The reanalyses of hydrological data enabled the use of smaller spatial units as the basis for suitability assessment as well as the calculation of production potentials. Furthermore, an open-source online application has been successfully developed that is available to the Austrian aquaculture sector. Thus, the information and results created by aquaNovum and this pilot study are available to decision makers and practitioners in the field of aquaculture and can support the Austrian aquaculture sector.

The refinement of the approach to identify locations for aquaculture facilities also included the implementation of a better differentiation of the suitability assessment. Thus, the suitability was not only assessed on a landscape level related to areal information but also on criteria that described the suitability of the water resources that should be used for the aquaculture production. This is highly relevant as different human uses, such as hydropower generation, flood control, irrigation, of water resources delineated by the river network already exist in Austria. These existing uses would compete with aquaculture production or would make a further use of the water resources for aquaculture production impossible. Accordingly, the approach now separately considers the suitability of (1) the water resources to be used, (2) the discharge that has been used in the aquaculture facility, as well as (3) the water course for an additional water abstraction. This enables a clear assessment if conflicting uses of the water resources exist. Thus, the new approach allowed for a distinction if sites are suitable or unsuitable due to the landscape structure (areal information) or due to limiting factors of the water sources (related to the river network). The hydrological data provided valuable information and underlined that the North-East and South-East of Austria are less suitable for salmonid production.

Two project workshops have been successfully implemented in the pilot study. Both workshops have been attended by representatives of the federal ministry, regional authorities, aquaculture associations as well as practitioners. The first workshop supported the further development of the approach as well as to define the requirements for the online application. The second workshop was used to present the results including the web-tool and to discuss how the tool can optimally support the aquaculture sector. In the best case the online application is used parties that are interested in the construction of an aquaculture facility as well as responsible authorities to support the admission procedure of aquaculture facilities from both ends.

The online tool has been developed based on R Shiny that makes it easy to build interactive web apps straight from R, which is an open source programming language. The online tool can be easily be implemented into any website where it can be made available to the relevant audience. Besides the results of the suitability assessment the tools enable the user to have a detailed look on the different criteria that has been used to calculate the overall suitability. This includes the possibility to recombine the criteria for the suitability calculation on an own choice.

The project duration of the pilot study was extended by 6 months based on a request by the project management. This was especially related to the circumstances caused by COVID19 and related restrictions such as several lock downs that took place in Austria. Considering that the holding of the second work shop was not feasible in autumn 2021 the second work shop was delayed to spring 2022.

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

This project is not directly related to the Austrian sampling routine. Thus, the direct incorporation of results in the national sampling routine is not applicable. However, the developed approach to quantify the production potential and the online application provide valuable data and thus information to the aquaculture sector in Austria. Therefore, the results provide long-term support for practitioners and authorities relevant to aquaculture and its sustainable expansion in Austria.

Regarding environmental variables:

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

Regarding environmental data on aquaculture included in the EU MAP ("mortalities" and "medicines or treatments administered"), research showed that unfortunately there are no administrative central data sources from which possible future data collection obligations could be met. Hence, for these two environmental

variables a simplified methodology was examined in the course of the first implementation of the Typical Farm Approach for the Austrian aquaculture sector. Overlapping with Pilot Study 3a – part 2, a data check was carried out by Pilot Study 3a – part 2 to determine if the used survey tool of the agri benchmark Fish network contains the variables of Table 8 of the Annex to the Commission's Implementing Decision. 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 cover both variables.

In the process of applying the Typical Farm Approach, data was gathered for the environmental variables "mortalities" and "medicines or treatments administered". The following table shows the results for 2020.

Species	Variable	Unit	Result
Carp	Medicines or treatments administered	Gram	0
	Mortality	Percent	35
Trout	Medicines or treatments administered	Gram	<i>No result obtained</i>
	Mortality		
	- Fry	Percent	25
	- Fingerlings	Percent	5
	- Grow out	Percent	5

The Covid-19 pandemic caused severe challenges for the approach, as the second focus group (trout production) had to be postponed twice due to national Covid-19-regulations and safety reasons. An online format is not suitable for holding focus groups within the Typical Farm Approach, as this would not provide the necessary discussion setting and would be disadvantageous for the outcome. Due to the Covid-19 pandemic and the necessary measures, the Pilot Study 3a – part 2 was extended until December 2021.

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

As Austrian aquaculture production is below the threshold in volume and value, data collection under the EU MAP framework is not mandatory. Hence, no regular sampling is currently planned by the Austrian administration, apart from national legal requirements.

### 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 WP 2020-2021: 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.

The period 2017-2019 is apparently a mistake which was overlooked . It should read 2020-2021. No work was foreseen in the WP 2020-2021.

## 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 WP 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.

The WP 2020-2021 does not contain text Box 5A. However, it is not applicable as Austria is a landlocked 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.

According to Commission Implementing Decision EU/2019/909 Chapter II para “5 No social and economic data on aquaculture need to be collected if the total production of the Member State is less than 1 % of the total Union production volume and value. Eurostat reports for Austria in 2019 4.250 tonnes of production with a value of 29,65 million €. Eurostat provides incomplete data for the EU’s aquaculture production in 2019 when the UK was still a member of the EU. Therefore, EUMOFA’s “The EU Fish Market Report 2021” which

contains data for 2019 was used. 1,27 million tons were produced with a value of 4,99 billion €. Using these figures, Austria's aquaculture production in 2019 was 0,31% of the overall EU production in volume and 0,60% in value.

The WP 2020-2021 does not contain text Box 5B. Quote from table 5b of the WP 2020-2021: "to be examined by pilot Study 3a: Socio-economic data in the fisheries and aquaculture sectors in Austria (Part 2)". The following information is provided:

#### 1. Evidence of data quality assurance

Within this section MS shall provide information on the methodology used to assure the quality of the data collected, highlighting those aspects where changes have been made during the sampling year. Information shall be provided by each sector (Fishing fleet, Aquaculture, Fish processing) for which data was collected and by each data collection scheme. In the case where the same quality assurance framework is applied to all sectors or/and all data collection schemes, information can be provided at general level with the indication "all sectors" or "all data collection schemes".

In those sections of Table 5B where "N" is indicated, Member States shall explain the main constraints and/ or the steps taken to fulfil this obligation. In the cases where a reference documents is requested, Member States shall provide a web link.

In cases where documents are not publicly available, due to institutions internal policy, confidentiality or other reasons, this shall be indicated by the Member State.

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 Pilot Study 3a – part 1 (2019-2019) to strive for surveys with longer time intervals and sound interpolation, Pilot Study 3a – part 2 focused on a simplified methodology for data collection and extrapolation by the so called typical farm approach (TFA), which could also used for interpolation.

The TFA is a data acquisition strategy for agricultural key figures and operational indicators based on model farms. Not empirical data, but empirically grounded 'virtual' data for sector-typical, representative farms are generated., The TFA includes aquaculture among other agricultural sectors (Lasner et al. 2017). The methodology is used for agricultural data analysis by statistical and research institutions (Langrell et al. 2012).

The TFA concept relies on diverse sources for pre-defining the selected case (statistics, reports). 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. FCR should meet volume of feed used and feed costs should be in line with feed volume and feed price), which guarantees a sound and intense inclusion of 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, 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

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B

The typical farm approach method is not very common in EU MAP data collection. Nevertheless, the methodology is established and sound. 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 (see description above).

### 3. Section P4 Confidentiality

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B

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

### 4. Section P5 Sound methodology

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B

Information on this principle should be briefly explained in Text boxes 3A, 3B and 3C. Description of methodologies used on data quality.

The used methodology of the Pilot Study is established, sound and based on a professional, yet simplified methodology (see outline and literature above). The applied methodology is documented and available in the final project report. Regarding the matter of consistency at MS, regional and EU level, to our knowledge, apart from Germany, no other MS has yet implemented the TFA as (supporting) part of the data collection.

### 5. Section P6 Appropriate statistical procedures

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B. Please provide a link if the documented revisions are available and not confidential.

The statistical procedures applied 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 of Pilot Study 3a – part 1, checking for a better fitting of the model if additional explanatory variables from the TFA are used.

As the Pilot Study investigated the TFA and the corresponding extrapolation methods for the first time, some points are not applicable:

- There are agreements for access and quality of administrative data between partner; this does not apply to the TFA data as there are no administrative data entailed
- Checking data collection, entry and coding does not apply to the TFA data, as this was the very first attempt to gather these data (e.g.no coding)

### 6. Section P7 Non-excessive burden on respondents

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B

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

There is no duplication of data collection.

### 7. Section P8 Cost effectiveness

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B

No or only short direct surveys are possible in the years of interpolation. Cost effectiveness is therefore comparatively higher.

As the TFA was applied for the very first time in the Pilot Study, no automatic techniques for data capture, data coding and validation are in place.

### 8. Section P9 Relevance

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B

The TFA was applied for the very first time in the Pilot Study; consequently, there is no distinguished group of end users, apart from those of EU MAP data, the ab Fish network and the project team itself. The project results are made available to the administrative bodies as well as to the sector's representatives. No constraints are expected.

#### 9. Section P10 Accuracy and reliability

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B. Information on this principle should be briefly explained in Text boxes 3A, 3B and 3C. Description of methodologies used on data quality.

As the TFA was applied for the very first time in the Pilot Study, there was no regular assessment or error detection implemented so far. Error documentation and correction takes place as inherent part of the Pilot Study. Data quality checks are done by consulting sectors representatives and experts.

#### 10. Section P11 Timeliness and punctuality

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B

As the TFA was applied for the very first time in the Pilot Study and there are not yet any plans on how to follow up on this methodology, there are not yet any plans on further timelines and executions.

#### 11. Section P12 coherence and comparability

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B

As the TFA was applied for the very first time in the Pilot Study, there are not yet any statistics, which could be compared over time.

#### 12. Section P13 Accessibility and Clarity

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B. Information and links to documentation on this principle should be briefly explained in Text boxes 3A, 3B and 3C. Description of methodologies used on data quality.

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](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 is publicly accessible and described in detail in the final project report (URL: <https://www.joanneum.at/life/publikationen/detail/anwendungsmoeglichkeiten-der-virtuellen-datensammlung-in-der-oesterreichischen-aquakultur-dcf-pilotstudie-3a-2>)