

# ENETWILD

## Workshops Conclusions & Final remarks of the AGM 2018



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### ***The Annual General Meeting of ENETWILD project***

Risk assessment, risk analysis and risk management require reliable (high quality) wild population data, which are not available so far. This project, funded by EFSA, is aimed at mapping wildlife species in Europe that are relevant for pathogens transmitted to animals and humans. The objectives that ENETWILD will develop during next years are focused on wild boar population data for risk assessment.

Seventy experts from wildlife health and population sector (including partners and the Advisory Committee) met in Parma for the first Annual General Meeting (AGM) of ENETWILD project. The participants learnt about the objectives of ENETWILD, reviewed current data collection practices and data validation rules, and discussed on methodologies for estimating the abundance and distribution of wild boar. While it was understood the complexity of working with wild boar data, at end of the day, the participants contributed to clarify what to do, what for, how to do it, indicating some key milestones.

ENETWILD and participants encouraged data sharing, and this meeting established the basis for a network with the key stakeholders. This common network of wild boar population and health professionals will improve communication and collaboration between experts and organizations, and will contribute to improve preparedness and responsiveness for wildlife diseases disseminated by this species in Europe, such as Africa Swine Fever (ASF).

#### *The objectives of the meeting*

The overall objective of this meeting was to present the ENETWILD project objectives and tasks, to present the consortium and its functioning, to review the approach to data collection protocols and validation rules for wild boar, and to define and prioritize tasks for the near future.

The specific objectives of this meeting were as follows:

- to present the objectives and strategic planning of the ENETWILD project, including the envisaged milestones and achievements;
- to review on the current methods for wild boar population data collection and the need of harmonization;
- to review on the current methods on determining and modelling the geographical distribution and abundance of wild boar in Europe;
- to review the validation and quality assessment criteria used in the data collection tool;
- to present the overall strategy of ENETWILD for wild boar data collection and sharing, and particularly, the data collection model (DCM) for wild boar;
- to assess possible methodologies for wild boar abundance mapping; and to review the network members' contributions and data sharing;



- to strengthen the links and collaborations between wildlife ecology and health within the One Health approach;
- to establish effective network of data providers (stakeholders); the data sharing conditions, deadlines, and explain the data collection framework of EFSA (DCF) and data repository;
- to agree on the template of the data collection model (DCM).

### *The outcomes*

This meeting provided a better understanding for the participants of the ENETWILD project, and user input on:

- the future data collection model (DCM) for subsequent submission of data to EFSA of geographic distribution and abundance of wild boar in Europe; where is data?
- the approach to wild boar population data validation and quality assessment criteria
- harmonized collection methods that will be promoted by the project
- enhancing the network for data collection and sharing
- field protocols to estimate wild boar abundance

### **Workshops**

The workshops were central in this AGM. The workshop I focused on data availability and the ways to get the existing data, while the workshop II focused on optimizing the way to collect this data and bring it to optimal suitability. The workshop III will focus on discussing the elements of the future DCM. The specific questions that were addressed in each workshop are listed below. There was a final conclusion session.

During the workshop the participants showed a very practical approach to respond specific problems. For workshops there were 6 pre-set groups of people with diverse expertise, nationality, type of participation (advisory committee, invited participants, ENETWILD partners, EFSA). The discussion groups provided to chairs, after each session, a list of their main conclusions. During the final conclusion session the chairs of the previous 3 sessions (workshops) summarized as a conclusion from their session, listing point by point, and gave place to further open discussion. This final discussion is the basis of the final remarks indicated in the last section of this report.

### *Summary*

Workshop 1 provided conclusions about what kind of data we need to develop maps of wild boar abundance. The group should collect presence/absence; and for abundance, hunting bags. The hunting bags are the only common data we have across Europe for abundance, and it has the potential to be converted into categories of

abundance/density. To collect data we need to identify who and how data is collected; and identifying and elaborating a list of stakeholders to be contacted later to submit our data model (DM). While the consortium prepares the DCM, a questionnaire will be an excellent tool to identify who and how hunting statistics are collected. During this workshop it was compiled some basic information on hunting data flows for 17 countries, which was very valuable to design this questionnaire.

Workshop 2 focused on how approaching the harmonization of methods for abundance estimation and what kind of data can be converted to develop wild boar abundance estimates. Workshop participants identified two levels of work and data for harmonizing activities: regional/national level (hunting bags) and local/hunting ground level (camera traps can be a standards for validation studies including other methods). It is necessary to identify which methods are used and rank them in order of how reliable they are. As this regards, the APHAEA cards are available, and in February 2018 the consortium will produce a review on methods to estimate wild boar abundance.

- In order to validate/calibrate existing and widely available data sources with camera-trapping to be able to use those sources in the future; we need specific study sites to perform such experiments (cross-validation studies). Nonetheless, for harmonisation of methods it is needed a long-term effort and funding for field-based experiments.
- However, available hunting data will be collected through the DCM (see workshop 3) during next months. The next step the consortium should address is to convert hunting bags into density categories). For which, it is needed (i) to correct hunting bags for hunting effort (area, number of hunter, hunting dogs, and hunting method single/massive; focusing on hunting grounds or large areas; making it relative to appropriate wild boar habitats) and (ii), if possible, get density prediction from the correlation between hunting bag indexes and densities (this can be only done where local densities are available). The strategy should be using the existing non-harmonized data in the short-term, but aiming at harmonizing recording of hunting data in the mid-term

Workshop 3 discussions addressed how to improve the DCM for wild boar population data. A number of fields for data and metadata, so as the format of cells and which complementary files (e. g. shape files) should be incorporated in the DCM were indicated. Certain fields would be mandatory conditional on the type of data. Simplifying the table should facilitate the collection of data. The DCM should give data providers freedom to define areas from which they can provide data, stressing the need for the highest possible spatial resolution, and not make them fit to NUT/LAU system. Metadata elements should remain and be the same we will the same fields as for the GBIF data file but we will use a selection of fields for our database model; and the DarwinCore is the basis of selection of fields. As discussed in workshop 2, in order to be able to convert hunting bags into density (at least abundance categories), the DCM must include data on area, number of hunters and hunting methods.

*Workshops conclusions*

**Workshop 1: Wild boar abundance and distribution data**

1. What kinds of data are usable for abundance maps (models)?
2. Where are data? (especially grey/unpublished data)
3. To review networks/stakeholders with potential to contribute
4. How approaching data providers
5. Inputs for the “hunting statistics collection frameworks”
6. Practical criteria for validation and quality assessment of wild boar presence data

**1. What kind of data are usable for abundance maps?**

- First step the group should collect occurrence data, i.e. presence/absence; this could be used to develop species suitability models (SDM) for all EU countries
- For abundance, hunting bags are the only common data we have across Europe. It has the potential to be converted into categories of abundance
  - We need first to see what data is available for each country: hunting statistics
  - Are we collecting also covariate information? Covariate datasets widely available - unlikely to be limiting
  - Validate data from different methods against measurement known to be accurate
  - Can we come up with categories from 0-very no- very high for abundance data?
- Suggestions:
  - Density map, normalized abundance, or abundance category map instead abundance map. Also produce an uncertainty map to be able to evaluate reliability of data in certain locations. Still not clear what spatial and temporal scale would be available and needed for risk assessment, but multi-scale data collection should be fine
  - Aggregated presence to give proportion area present
  - When recording hunting bags/density, we should be careful with the following elements: what is the area from which the hunting bag comes from? (forest area, or all land area ?); which hunting method is used: driven/silent/fenced? What is the time of density estimate: before or after reproduction?
  - In any case categories should correspond to numerical ranges of abundance since it is needed quantitative information.
- Data may occur at four levels:
  - Single spot: Georeferenced shooting of boar (e.g. northern Belgium and study in Brandenburg); camera traps, killed on roads data (Slovenia, Czech Republic, part of Netherlands); App-based recording (Netherlands, Belgium) – needs a web search to find others. Also ASF submissions

- Grid: Slovenia, Finland and Norway report wild boar hunting in small grid (e.g. 1km<sup>2</sup>)
  - Hunting ground: Hunting areas vary from 100ha to 4000ha. Bag numbers reported are a minimum shot, also poaching nos. unknown. Also need to record – are quotas set (reporting will always be within quota!), how are they set, has this varied between years, and what is the intended aim of hunting quota – the political angle. For example Poland sets exact quota per hunting ground, but has increased this this year to 'eradicate' wild boar
  - Regional level: aggregated and summarized information (raw data are not recorded)
- Data need to be over the last five years, possibly more if available.

## 2. Where are data?

- Official agencies/bodies
- Research groups
- Management group
- Hunting stats

Suggestion: to ask each ENETWILD participants what they know about wild boar hunting data collection frameworks - a questionnaire. A protocol for whom (list of people) and how to reach potential data providers need to be established (e.g. first you contact official agencies/bodies, if not answer or in parallel you contact hunting associations, if not answer, try expert opinion or gather data from literature?)

## 3. To review the network of stakeholders

Suggestion: the list of data providers and stakeholders need to be defined as well as the order or way to approach them

## 4. How approaching data providers

- Need to create profiles of organizations and institutions to be approached for data
- Need to locate where certain types of data are (occurrence, density, abundance) using a questionnaire
- Target different stakeholders for occurrence data ("citizen-science" organizations) and density/abundance data (governmental agencies)
- Prepare and provide agreement for data use ("Data sharing agreement"), also for organization owing citizen-science data on occurrence
- We risk potential conflict with animal welfare groups if harvest data is made public on the project website (embargo on some specific, sensitive, data)
  - First: Identifying data providers: administration, hunters, scientist, laboratories (*Trichinella* analysis), wildlife managers, APP users (citizen science), damage reports (landowners)

- Need to differentiate sources (providers) for presence and for abundance data. Data type and accuracy will depend on the data provider type
- Once identified, how to approach them?
  - Design a specific approach and strategy to fit to each provider type and interests
  - Promoting national meetings and discussions among the different stakeholders (data providers), perhaps at a National level
  - Explain the motivation to have the data and put it in the context of national interests
  - Communication, hunters could be involved in decision taking

## 5. Inputs for the “hunting statistics collection framework”

- Need for review of what kind of harvest data (numbers, spatial units, hunting effort, methods, flow of data) countries are collecting to be able to harmonize; review of the national hunting statistics collection frameworks (draft and circulate questionnaire), identifying target contacts to ask for data (where data still is disaggregated)
- Need to maximize data collection, i. e. construct a database in a way to allow for collection of all potentially useful variables (not all mandatory)
- We can use EU regulations to demand detailed explanation of the national hunting (data collection) systems
- Some data are public, but communication with hunters is essential. They should trust and rely on the objectives of sharing the data. Meetings with hunters should be carried out in order to make them participate
- Regional and national variability in data availability and hunter collaboration may hamper harmonisation and a good coverage of the data collected
- Data sources: hunting, studies on specific spots with actual densities (useful to infer densities to non-surveyed areas), additional efforts (photo-trapping, other abundance determination methods). They should be prioritized in this order and they complete each other sequentially
- Situation and problems:
  - Spain
    - Regional variability, national data. Problem of Federal nature
    - Hunting bags available per year and hunting unit from the 17 regions (not centralized)
    - Distribution available
    - Abundance index available for about 20 populations
    - Density estimate scarce
  - Italy
    - National Agency (ISPRA) collects data from all the regions, so national data can be split to regional data
    - Hunting districts, organized through hunter associations, may provide detailed information
  - France
    - ONCFS collects all the information (aggregated), also for local hunting areas
  - Netherlands

- Wild boar is a protected species, there is a quota. Data from hunters registered in a non-harmonized way with different accuracy on location and animal data. Provinces starting to manage the data
- Hunting bag available in the 12 provinces per hunting unit
- Road kills are difficult to access
- Some abundance index may exist
- Switzerland
  - 26 cantons, registering the data from each canton with a different hunting system
  - Data for each hunting ground exists but they are not centralised. Data are submitted by the hunters
  - Cantons transmit the data to a National level but there is a loss of metadata from local to national level
- Denmark
  - Data for whole country (compulsory to get the hunting license). Problem of not differentiating farmed vs wild boar
- Luxemburg
  - 600 small hunting areas, reporting annual hunting bag to the administration, with some data loss from local to administration/national level
- Slovenia
  - Hunters must put much information for every single wild boar, including GIS in a 1x1 m grid
- Finland
  - It is compulsory to report immediately a hunted wild boar by the hunter to a National level. Data is public and available, and very straightforwardly transmitted
- Latvia
  - Compulsory to report, but there can be a one-month time lag. Latvia has already provided 2017 data to EFSA
- Estonia
  - Hunters (users of hunting grounds) are obligated to report
- Lithuania
  - Every hunting ground user must provide the data to the state
- Bulgaria
  - Specialists from the Forest Agency collect all data from the regions and transmit it to a national level. No involvement of hunters.
- Sweden
  - Hunters report voluntarily, but it corresponds very well with *Trichinella* analyses (which are also non-mandatory). They report directly to the national responsible
- Germany
  - 16 federal states. Two ways of reporting, either hunters or hunting grounds. They report to the respective hunter association, and then to the regional and national levels
- Portugal
  - Hunting bag /year and /hunting unit are available at the national agency
  - Density is available for 2-3 area



- UK
  - From citizen science for other population (check SASA): occurrence and abundance index
  - Density (distance sampling) from forestry
  - Information one 1 population: hunting bag and road kill
- *Trichinella* analyses (when geo-located) could be used as quality control for the data gathered. Also perhaps car accidents, which are mandatory to report in some countries (e. g. Sweden) and/or crop damages.
- PROBLEMS: Compliance in reporting (reliability, at all steps hunter-reporter-administration), farms (most food from human origin), record of found dead. Definition of hunting year against natural year. Variability in metadata. Level of digitalization of the data (web service against written submission)
- Suggestion: To Identify areas with data coverage and white areas, and involve hunters in the interest to complete the area cover

## Workshop 2: Practical methods to estimate wild boar abundance

1. How harmonizing practical abundance estimation methods
2. What kind of data can be converted to develop wild boar abundance estimates

### 1. How harmonizing practical abundance estimation methods

- Harmonization aims at improving comparability among data collected.
- To identify which methods are used and rank them in order of how reliable they are. Identify which the methods have to be harmonized (most used standard method? and is there any gold standard method?). Identify which methods used in each country/habitat and develop transformation tools to be able to compare data from many sources (hunting, telemetry, camera trapping, field monitoring etc.)
- Camera traps method would be recommended as a uniform method of estimating wild boar abundance all over Europe. A proper detailed protocol should be worked out
- Need for developing and harmonizing abundance determination methods in some cases is independent from hunting, since progressively a higher proportion of wild boar population is thriving in non-hunted areas (urban, periurban, protected)
- Exclude human-dominated areas from calculations on hunting grounds
- Two levels: Regional/national level AND local/hunting ground level (differences in habitats/barriers and fences)
  - Regional/National levels
    - Hunting bags
    - Using the existing non-harmonized data in the short-term, but aiming at harmonizing recording of hunting data in the mid-term
    - National data are available; regional data should be equally available, but it is not always like that; local data availability is more variable. One goal should be proposing European legislation changes in order to harmonize data collection and availability

- Modelling based on hunting bags, habitat suitability model, density data (if available, normally more qualitative than quantitative). Determining an effort limit and detectability (depending on the method used to assess abundance) are essential to use abundance estimates for modelling. Again, metadata are basics. Detection APP (citizen science) could also be used for modelling
- Indirect indicators of density, such as road accidents/mortality or crop damages, could be used as trend indicators and data quality control
- Local/hunting ground levels
  - Camera trapping
  - Drive hunt/counts
  - Direct counts (feeders, areas allowing direct sampling, ...)
- Time perspective: first level right now (but there are budgetary constraints), secondly able to be developed and harmonized in a reasonable time (2-3 years)
- Propose to incorporate these calibration experiments in the ASF control programmes for Member States as an EFSA (or EC) recommendation; e.g. "to increase the capacity of interpreting lab results of ASF diagnostics we need to calibrate field estimation methods of wild boar abundance..."
- For harmonisation of methods we need long-term effort and funding for field-based experiments. When financially possible, decide who will do it within the consortium and from the respective regions/countries
- Seasonal and annual corrections are needed
- Separate by categories low risk - high risk: used additional study in high risk areas to create recommendations based on multiple scenarios
- Suggestion: Validating/calibrating existing and widely available data sources (harvest data) with camera-trapping to be able to use those sources in the future; we need specific study sites to perform such experiments (cross-validation studies). Find the correlations between used methods in deeply studied regions to develop transformation tools that could be used for abundance estimation in all Europe

## **2. What kind of data can be converted to develop wild boar abundance estimates?**

Suggestion: Convert hunting bags into density (look for local scientific studies to provide indexes, e. g. Italy 2 cases, Poland 6 cases, etc.), two approaches:

- a. Get hunting bag index, from hunting bag corrected for hunting effort (area, n<sup>o</sup> of hunter, hunting dogs, and hunting method single/massive) from large areas
- b. Get density prediction from this correlation between hunting bag index and density at large scale
- a. Get hunting bag index, from hunting bag corrected for hunting effort (area, number of hunter, hunting dogs, and hunting method single/massive) from research site
- b. Study the correlation between hunting bag index (i.e. hunting bag corrected somehow by hunting effort) ~ density (in the specific research areas where it is done with the best available method, i.e. camera traps, CMR, distance sampling)

### Workshop 3: The model for wild boar data collection

#### 1. How to improve the Data Model

- People and organisation are the same compared to the first section. Instead, the data model will have multiple contact names and emails
- The geographical Coverage should include a country dropdown choice (incl. Europe-wide)
- Is there a shape-file describing boundary? And where is it?
- Methods: use a dropdown choice (e.g. sighting, hunted, RTA (killed on road data), lab testing, and include multiple (both RTA and sighting)
- Using hunt data for occurrence (field defining type of occurrence data: sighting, shot animal, road kill, etc.)
- Occurrence data – start and finish date for camera records
- Verification per record (e.g. as in National Biodiversity Network of UK – correct, probably correct, etc.)
- Facilitate data collection by simplifying the table (or using an App)
- Create automatic/closed fields - able to choose among listed (not open questions)
- Define a minimum number of mandatory fields: might need a field that determines data type. Certain fields would be mandatory conditional on the type of data
- Add in cell of table - not available vs missing vs zero
- Give data providers freedom to define areas from which they can provide data, stressing the need for the highest possible spatial resolution, and not make them fit to NUT/LAU system
- No need for 2 separate databases for occurrence and harvest/abundance data; just add a field at the start directing to either occurrence or harvest/density database
- Metadata has also be filled by the data providers
- Same fields as for the GBIF data file but we will use a selection of fields for our database model
- The DarwinCore is the basis of selection of fields
- Select fields that are mandatory
- Dataset (Resource) should be completely selected, but mandatory:
  - o Title, creator; add ownership
- Temporal and geographical coverage of data is mandatory
- Methods should be completely selected, but mandatory
  - o methodStep, qualityControl
- Intellectual property rights is mandatory (additional field regarding display of data or mapping on the EFSA website might be useful)
- Citation might be useful, but not mandatory
- Metadata elements should remain and be the same for all the data type generated (occurrence, density and harvest). Workshop participants provided a minimum metadata set

## FINAL REMARKS of the AGM: A PLAN

### A. Feb - Jun 2018

The strategy should be using the existing non-harmonized wild boar data in the short-term (occurrence and hunting statistics), collecting the more accessible data. Risk and ASF affected areas are targets.

#### DATA COLLECTION

##### FEB 2018

- Guidance on how to calculate reliable estimation of wild boar abundance to have understanding about if and how it is possible to derive abundance from other data types (e. g hunting statistics)
- **Data sharing agreement done**

##### FEB-MAR 2018

- To describe **hunting statistics collection frameworks across Europe**, who owns/manages still disaggregated data? The consortium will distribute a questionnaire among participants and other stakeholders
- **Closer links with hunter associations:** development of an APP for presence and hunting data

##### MAR 2018

- Standards for presence data ready
- **Data Collection Model (DCM)** and accompanying dictionary and guidance ready for presence (based on standards) and hunting statistics. DCM will be flexible enough to incorporate different types of data and their uncertainty

##### APR-MAY 2018

- Actively contact data providers to explain data model and support them in uploading wild boar population data in the DCF
- Actively contact hunters to explain apps, data integrated into the DCM
- DCM integrated in to EFSA DCF
- Upload data in the DCF with available data for ASF affected, in risk or neighbouring countries.
- **DCF is filled with all available data** for other countries in N, W, S Europe



**PLAN FEB-JUN 2018**

Complete census of European wildlife species presence databases, following a standardized protocol

- Description of national systems and organizations responsible for species' presence, distribution and abundance data collections.
- Presence standards ready

February

March

April

May

Guidance: how to calculate reliable estimation of wild boar abundance: how it is possible to derive abundance from other data

- Definition of items to collect in the **Data Collection Model (DCM)**
- Data dictionary on wild boar density

Actively contact data providers to explain DCM

Upload data in the DCF of EFSA

Distribution of questionnaire: how hunting statistics are recording across Europe, who manages disaggregated data

## **B. Jun 2018-Apr 2019**

The strategy will focus on occurring and abundance (hunting bag) data

### DATA COLLECTION

- EFSA data collection framework (DCF) continuously filled with all new available data, in particular the ones related to 2018 season:
  - Submissions of data for all European Countries that is considered usable and from EFSA
  - App for hunters
- Actively contact data providers to explain the data Collection Model (DCM) and support them in uploading wild boar population data

### PREDICTIVE MODELLING OF WILDLIFE POPULATION DISTRIBUTION AND ABUNDANCE

- **Agreement on Modelling approach**
- **3 monthly updates for models**, including new data and improving accuracy (first data will be replaced by more precise data and Citizen science). Updated model outputs that can identify areas to prioritise data collection
- **Validation of model output**: Revised maps are closer match to available understanding and data.

### HARMONIZATION FOR GENERATION OF NEW DATA

- **Publication on hunting statistics collection frameworks across Europe**, involving AGM participants
- **Harmonize the use of hunting statistics for abundance estimation** in different study areas