***European Observatory of Wildlife***

**Collaborative agreement**

The Universidad of Castilla-La Mancha (UCLM), as the coordinating institution of the project *ENETWILD (www.enetwild.com)*: “*“Wildlife: collecting and sharing data on wildlife populations, transmitting animal disease agents” (Specific Contract number: OC/EFSA/ALPHA/2016/01 – 07)*”, funded by the European Food Safety Authority (EFSA), and represented by Joaquín Vicente Baños (coordinator of the ENETWILD project),

and

XXXX (INDIVIDUAL), as national collaborator of the European Observatory of Wildlife (EOW) (https://wildlifeobservatory.org/), by ENETWILD in Country Address: address.

undertake to establish a collaboration to implement one/several study area of the *EOW* in name/s study area/s and Country, and to to support field activities. The time frame isfrom signature until December 2023.

**SPECIFIC TASKS related to implement one or several study areas of the EOW and reporting to the EOW collaborator**

* The MAIN AIM of this initiative is to contribute to a coordinated network of “observation points” provided by collaborators from all European Countries capable to monitor the density of wildlife populations at European level.
* **Implementation of the protocol**
  + The collaborator will select at least one study site in their respective countries to determine wild mammal (medium to big sized) densities.
  + Camera trap will be deployed for approximately a minimum of 2 months in each study site within the period July-October 2022 and will be moved twice (but to discuss the specific case) during the study period (weeks 3 and 6).
  + The field protocol, based on an updated ENETWILD guidance, is attached (but may suffer slight modifications). Basically, it consists of a grid of 12-15 camera traps covering an area between 2000-6000 ha.
  + The criteria to select the study site are:
    - It contains forest habitat (interspersed with other habitats)
    - Hunting statistics are recorded by event (hunting\*day) (in case collective hunting is practiced). When ungulates are hunted mainly by communal hunting (drive hunts), fine resolution hunting statistics per event (nº animals shot, sighted and surface beaten) must be recorded (see form attached).
    - A temporal overlap of camera trapping and hunting activities must be avoided to the extent possible. The optimum situation is hunting activities to start immediately once the camera trap field trial ends, but partial overlapping is possible (e.g., camera trapping carried out in Sep-Oct and hunting is from Oct onwards). For this reason, we encourage starting camera trapping field work early in September. However, given the holiday season and logistics issues, so as the dense cover of vegetation in certain latitudes, it will only be possible and/or recommendable to develop this activity in another period. We will discuss each case in detail with you.
* **Reporting (by email)**
  + At the signature of this agreement: providing information of the general characteristics of the study area (see table at the end) which will be incorporated as an annex to this agreement).
  + Shapefile of the borders of the study area.
  + Provide coordinates of the camera trap placements (which will be confidential and not publicly shared/displayed)
  + Estimated density (or database ready for analysis).
* **Data processing and density estimation**
  + Our goal is to make participants independent in processing and calculating density, so that you can perform this activity anywhere anytime at your convenience in the future. This is a big step for density data generation and harmonization at European scale.
  + All images will be processed in AGOUTI app (<https://www.agouti.eu/>), where a specific project will be created for each study area. Training on camera trapping, density estimation, AGOUTI app use and automatic data analysis (by artificial intelligence tools) will be provided.
  + Density estimations or output files (AGOUTI)

**LIABILITIES**

* The collaborator may depart from the agreement at anytime

**TRAINING**

* Spring 2022: **First online course** provided by ENETWILDon camera trapping and density estimation, specifying the details of the protocol to be implemented
* Summer 2022: **Second online course** by ENETWILD on data processing, use of artificial intelligence tools and specific apps (AGOUTI and external module to run REM analysis).

**TECHNICAL SUPPORT**

* Continuous contact and support to answer any question that arises during the development of the study.

**OUTPUTS**

* The results (densities) will be public and showed in the EOW website (interactive map).
* Any publication in indexed journals derived from the use of these data will include collaborators as co-authors.

Place, XXXX date xxxxxx

For UCLM For XXXX

Joaquín Vicente Baños XXXXXXXX

**ANNEXES**

**Information to provide once the study area is selected.** We will provide also provide an access to the EOW website to enter data in a dynamic interactive map.

|  |  |
| --- | --- |
| **Information to provide** | |
| **Name study site** |  |
| **Person contact** |  |
| **Country** |  |
| **Region/municipality study site** |  |
| **Institution** |  |
| **E-mail/s** |  |

**Instructions for the placement of cameras of phototrapping and calculation of density of wild boar**

This section presents basic instructions to estimate the density of wild boar using camera traps (CTs). Since different methods are available, we will focus on a practical one that can generate reliable data in a wide range of situations (and species) throughout Europe. The random encounter (REM) model does not require individual recognition. However, it is necessary to collect certain information to determine the speed of movement (average daily movement range) of the wild boar. Therefore, it is necessary to place marks or stakes at a distance from the CTs that serves as a guide to subsequently mark the path followed by each animal, as indicated below. These instructions are also applied to REST and Distance sampling methods.

• The work should be developed during autumn/early winter, with the CTs placed a minimum of 60 days.

• They will be placed (registering the geographical coordinates) following a regular uniform distribution as a grid with a minimum of 36 camera placements. The separation between CTs will be approx. 1.5-2.5 km. The exact location can be within a diameter of less than 100m around the points of the grid. If the number of CTs available is not enough to sample the 36 placements at the same time, the CTs should be moved during the experiment to cover the minimum of 45 locations. For instance, 12 CTs moved twice (every 3 weeks), which fit a study area of approximately 2000-6000 has. However, in case the study area is bigger, the distances between camera traps can be larger that 1.5 km, and if possible, it is recommended placing more camera sites.

• The grid must cover at least one patch beaten during the hunting season, if possible, more; or several grids for several patches.

• Place stakes in 2.5m intervals (Figure E). Connecting the stakes with signalling tape helps to better visualize distances (Fig C). Finally, ensure that a photograph is taken from the CT where these stakes are evident. Put natural marks (stones, branches…) before remove the stakes for later identification of the path of the animals photographed (Fig D)

• The CT will be placed on poles or vegetation 40cm above the ground.

• The CT is configured with operation of 24 hours per day and to take up to three consecutive images (the maximum number possible), with the minimum waiting time (0 sec. if possible) between activations. Set sensitivity to medium.

• The flash intensity should be set to medium (if possible) to avoid “overexposed photos”.

• Check that the date and time are correctly set, and that they are printed automatically on each image.

• The CT should be reviewed at least halfway through the study period (ideally once a month) to check its functioning and placement. Normally it will not be necessary to change the batteries and the memory cards, since the CTs are placed at random points and high wildlife activity is not expected.

• Choose a field of vision of the CT that is cleared of vegetation (it is not necessary to be totally clean, but that allows the detection of any wild boar that passes within the first 5 m), being better a north orientation.

• A form must be filled in, collecting the information of each CT during its placement (see below). All the information that is subsequently extracted must keep the traceability of the CT (mark the source camera of each memory card extracted and keep this nomenclature in the folders that are created on the computer to archive the images).

• This protocol is accompanied by basic instructions to place at least one additional camera trap per study area to calculate more precisely the average group size of the population.

**![Gráfico, Gráfico de líneas

Descripción generada automáticamente]()Gráfico, Gráfico de líneas

Descripción generada automáticamente**Una manada de borregos en el campo

Descripción generada automáticamente

**E)**

Figure 1. A) Scheme of the stick-structure (grey dots) used to reference the animal captured by the camera-trap (black dot). XB indicates the position of the wild boar captured in the image B. B) Photo-captured wild boar. C) Photo of the structure installed in one photo-trapping sampling point. The camera should be oriented so that the well-centred stakes are displayed. D) Natural marks (stones) used as references after removing stakes. E) It is recommended to leave marks on the points marked in green, optimally natural ones (stones), after removing the sticks and taking the blank picture. To mark distances, you can use a rope with knots or marks at 2.5, 5, 7.5 and 10 m, which is very practical. By turning it from the camera position and using the distances indicated in E), reference points can be easily marked. If for any circumstance the angle and radius of the marked field are modified (for example, adapting to the camera model or the terrain), these new distances must be indicated to perfectly define the field of study in the annotations sheet. This protocol will be slightly modified to make use of intelligence artificial tools when analysing the images, which will be explained during training courses.

**Required material**

• CT adequately configured (see above), with proven batteries (alkaline) and compatible memory card. Check that the cards save the photos successfully, since sometimes they are not compatible with the camera model

• Memory card of 8 GB minimum size, recommended 16 GB if the camera supports it

• 50 cm stakes (or poles) and hammer to place them. 8 of them are required for the initial photograph of each study point. 2 of them will stay (5 and 10 m)

• Signalling tape

• GPS for recording geographical coordinates

• Single-use camps are very practical for fixing the cameras

• Hoe for vegetation cleaning, only the strictly necessary within the first 5 meters

|  |  |  |  |
| --- | --- | --- | --- |
| **FORM TO COLLECT DATA DURING HUNTING DRIVES (one drive one form)** | | | |
| Name and position (organizer, ranger, etc.) of count coordinator: / | | | |
| E-mail: | | Telephone: | |
| Date: | | Municipality: | |
| Hunting ground ID: | | Hunting ground name: | |
|  | | | |
| Hunting drive (name of the patch covered and/or consecutive number within the season): | | | |
| Start time: | | End time: | |
| **Name and/or name of the stalking site:** | | | |
| Nº hunters (stalking sites): | Nº beaters: | | Nº dogs |
| Did you look for tracks before? | | | |
| Did you bait the hunted area? | | | |
| Beaten area (has): | Is there GIS file available? (yes/no): | | |
|  | | | |
| **Total Nº sighted wild boar** (including those hunted): | | | |
| **Total Nº hunted wild boar:** | | | |
|  | | | |
| **Total Nº sighted red deer** (including those hunted): | | | |
| **Total Nº hunted red deer:** | | | |
|  | | | |
| **Total Nº sighted roe deer** (including those hunted): | | | |
| **Total Nº hunted roe deer:** | | | |
|  | | | |
| **Total Nº sighted other species** (including those hunted):Indicate species and nº | | | |
| **Total Nº hunted other species:** | | | |
|  | | | |
| **Total Nº sighted other species** (including those hunted): Indicate species and nº | | | |
| **Total Nº hunted other species:** | | | |
|  | | | |
| **Total Nº sighted other species** (including those hunted): Indicate species and nº | | | |
| **Total Nº hunted other species:** | | | |
| INSTRUCTIONS TO FILL THIS FORM | | | |
| * Each stalked hunter must fill in this form for his position (fields indicated in grey) * Next, all data must be summarized in a single form by the co-ordinator of the drive count, who will fill in the form for the total count of the event. You should consider the possible double counting by neighbour hunting positions * It is very important to fill in the form even if no piece has been seen or hunted, in this case in the corresponding boxes it will be set 0 | | | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Nº of the study point** | **Nº CT and memory card** | **Coordinate X** | **Coordinate Y** | **Date setting-up CT in the field** | **Time setting-up CT in the field** | **Picture of vision field with marks taken? (Y/N)** | **Date CT removal** | **Time CT removal** | **Observations: any eventuality, indicate if revision is made, the date of this, aspects of functioning of the CT, if it dropped down, if still correctly attached, any failure, change of memory or batteries, etc.** |
| 1 | / |  |  |  |  |  |  |  |  |
| 2 | / |  |  |  |  |  |  |  |  |
| 3 | / |  |  |  |  |  |  |  |  |
| 4 | / |  |  |  |  |  |  |  |  |
| 5 | / |  |  |  |  |  |  |  |  |
| 6 | / |  |  |  |  |  |  |  |  |
| 7 | / |  |  |  |  |  |  |  |  |
| 8 | / |  |  |  |  |  |  |  |  |
| 9 | / |  |  |  |  |  |  |  |  |
| 10 | / |  |  |  |  |  |  |  |  |
| 11 | / |  |  |  |  |  |  |  |  |
| 12 | / |  |  |  |  |  |  |  |  |
| 13 | / |  |  |  |  |  |  |  |  |
| 14 | / |  |  |  |  |  |  |  |  |
| 15 | / |  |  |  |  |  |  |  |  |
| 16 | / |  |  |  |  |  |  |  |  |
| 17 | / |  |  |  |  |  |  |  |  |
| 18 | / |  |  |  |  |  |  |  |  |
| 19 | / |  |  |  |  |  |  |  |  |
| 20 | / |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Nº of the study point** | **Nº CT and memory card** | **Coordinate X** | **Coordinate Y** | **Date setting-up CT in the field** | **Time setting-up CT in the field** | **Picture of vision field with marks taken? (Y/N)** | **Date CT removal** | **Time CT removal** | **Observations: any eventuality, indicate if revision is made, the date of this, aspects of functioning of the CT, if it dropped down, if still correctly attached, any failure, change of memory or batteries, etc.** |
| 21 | / |  |  |  |  |  |  |  |  |
| 22 | / |  |  |  |  |  |  |  |  |
| 23 | / |  |  |  |  |  |  |  |  |
| 24 | / |  |  |  |  |  |  |  |  |
| 25 | / |  |  |  |  |  |  |  |  |
| 26 | / |  |  |  |  |  |  |  |  |
| 27 | / |  |  |  |  |  |  |  |  |
| 28 | / |  |  |  |  |  |  |  |  |
| 29 | / |  |  |  |  |  |  |  |  |
| 30 | / |  |  |  |  |  |  |  |  |
| 31 | / |  |  |  |  |  |  |  |  |
| 32 | / |  |  |  |  |  |  |  |  |
| 33 | / |  |  |  |  |  |  |  |  |
| 34 | / |  |  |  |  |  |  |  |  |
| 35 | / |  |  |  |  |  |  |  |  |
| 36 | / |  |  |  |  |  |  |  |  |
| 37 | / |  |  |  |  |  |  |  |  |
| 38 | / |  |  |  |  |  |  |  |  |
| 39 | / |  |  |  |  |  |  |  |  |
| 40 | / |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Nº of the study point** | **Nº CT and memory card** | **Coordinate X** | **Coordinate Y** | **Date setting-up CT in the field** | **Time setting-up CT in the field** | **Picture of vision field with marks taken? (Y/N)** | **Date CT retrieval** | **Time CT retrieval** | **Observations: any eventuality, indicate if revision is made, the date of this, aspects of functioning of the CT, if it dropped down, if still correctly attached, any failure, change of memory or batteries, etc.** |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |
|  | / |  |  |  |  |  |  |  |  |

Use as many forms as necessary