

LIFE + BIODIVINE - Mammals protocol 2013

Objective:

In the BIODIVINE project mammal monitoring should be performed to measure the diversity of mammals on each site (main objective). A secondary objective is to see if we can see a link with conservation actions. This protocol has been adapted according to the experiences we've had with the 2012 observations.

Equipment: Technical elements

Observations will be done through camera observation (Bushnell trophy cams), allowing day and night observations.

- 10 cameras should be available on each of the 7 sites of the project (in some cases theft has reduced the number of cameras, no obligation to buy new cameras).
- Camera should be equipped with 4 (8) Gb SD card allowing approximately around 1000 10 seconds videos to be stored (4 Mb per video, intermediate camera resolution....)
- Cameras should be installed (setup mode) as follows:
 1. **VIDEO mode**
 2. **Intermediate resolution** (640 x 480)
 3. With **10 s** video length for each observation to optimize identification
 4. **5 minutes** (5M) interval between videos to avoid recording the same animal twice or to have recordings when windy conditions.
 5. Sensor level = **NORMAL**
 6. **Time stamp on** (allowing date, time recording through file properties, be sure to set date and time correctly)
 7. **Field Scan off** (detection will run 24 hours per day)
 8. Sound should be **OFF**.
 9. This should yield 4 Mb video shots.

Camera mounting (see figs 1 and 2):

- Cameras should be installed at approximately **50-75 cm** height
- Cameras should be installed slightly directed to the soil (15 to 20%)
- Camera angle for motion detection and recording is about 100 degrees in the horizontal plane (wide angle) and 25 degrees in the vertical plane (see fig 1 and 2)
- Avoid wide angle 'landscape' shots that might contain many 'moving' objects.
- Problems can occur due to wind, or objects in the distance.
- Do not put the cameras higher since we also want to be able to observe small mammals.
- Cameras should be installed in front of an 'open' space covering approximately 8 to 10 m wide and 5m long (camera range, see fig 2).
- Cameras should be facing **NORTH** (NE to NW) to avoid sun shining into camera lens. If this is not possible try to find a shaded spot for the camera.
- Best observation points should not have high vegetation (moving) in front of the camera.

- **If possible cut down / mow the existing vegetation at the beginning of the two weeks observation period. NB problems occurred in 2012 due to branches moving into the detection range of the camera.**
- Cameras should best be physically engraved / marked to avoid theft.
- We do propose a simple system where the camera is hidden (camouflaged) inside a piece of wood (see picture 3).

Surveillance protocol:

- Cameras should be operational for 3 months during the period from **March till November**.
- Cameras are to be installed on a single location for 14 consecutive days and then be moved to the next location.
- At this same moment cameras will have to be checked to download pictures (or change the SD card) and check batteries.
- With a full set of batteries the camera should last a whole season.

Camera location selection protocol:

- One person (Mammal protocol manager: MPM) will be responsible for mammal monitoring data analyses on each site.
- We propose to select FARMERS (1 camera per farmer) and ask them to manage the cameras (repositioning, download of pictures), but this can also be done by the MPM or any other person that is available. Any other organisation is acceptable, try to find the best solution to your site. If you plan on asking the farmer, please, make sure that he/she will do the monitoring properly but not approximately.
- The MPM should visit the farm and select most appropriate locations at the beginning of the campaign.
- All locations should be identified at the beginning of the campaign, according to the location selection method indicated below.
- 2 locations per camera. These locations have to be divided into 3 different ecotones between vines and a semi-natural habitat.
- Ideally, all points should be in priority located inside the buffers already digitized and used for landscape analysis (arthropods traps network).
- The interfaces that will be monitored in priority are: **forest, scrubland/hedgerow and meadow/fallow** in order to monitor habitats representatives of Actions C. If you don't have these interfaces on your site, please find an alternative that matches as much as possible the Actions C of the project.
 1. These three ecotones types have been selected to represent the different vegetation layers, if not available try to find habitats close to trees, shrubs and herbaceous plants). These are also reflected in the conservation actions (hedges, seed mixtures...)
 2. If conservation actions have been done (hedgerows, fallow plots) these can be monitored.

3. Please give priority to places where most animals could be observed (discussion with land owner).
4. Do avoid places where many people will go through since this means extra shots and higher risk of theft.
5.
 - Locations should be indicated on a map (aerial photograph), with georeferences and dates when the camera will be installed of each location.
 - Cameras should be installed and run for either 2 times during 3 weeks (in priority) or 1 time during 1 month and a half, after which that will be moved to the next location (see surveillance protocol).

Data analysis

- All data will have to be transferred to the MPM
- All videos should be viewed by the MPM, if possible please identify species

Optional

All videos containing “moving organisms” (including humans and equipment) will be analysed more in detail for:

1. Number of observations of each species
2. Species diversity (biodiversity)
3. Number of individuals (estimation of the frequency in each configuration).

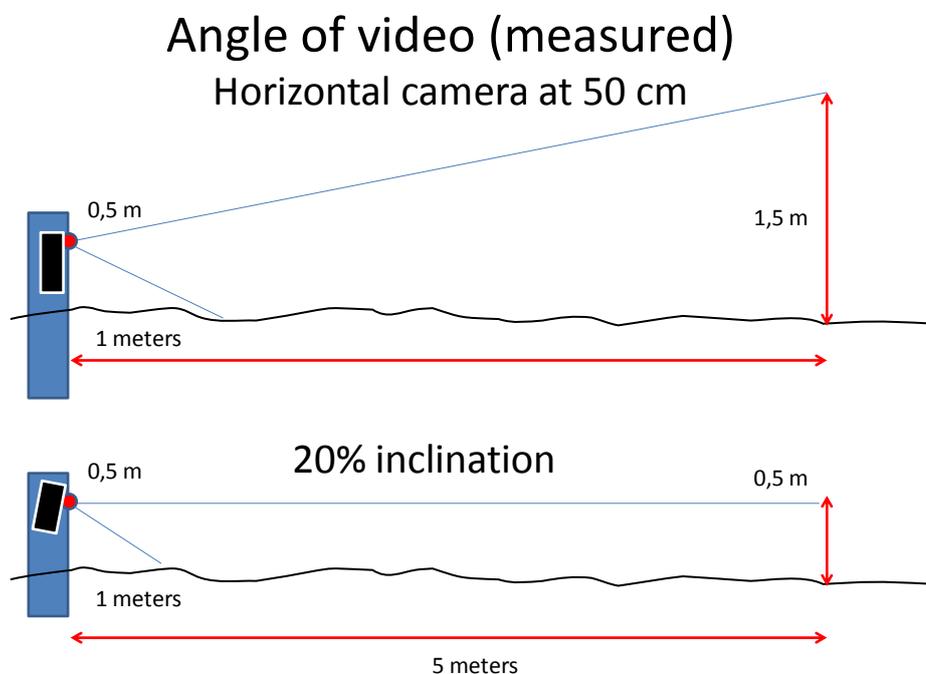


Figure 1: Camera installation: camera should be positioned inclined about 20% towards the soil to avoid too much detection.

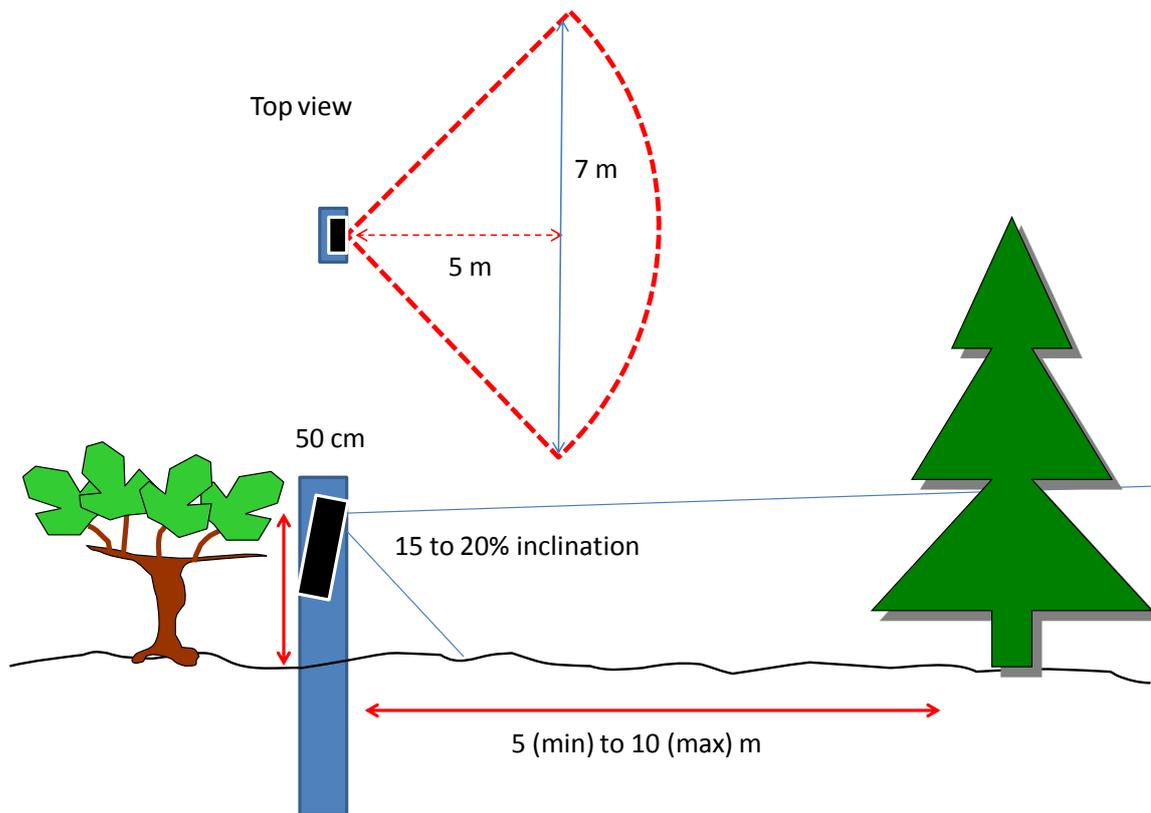


Figure 2: Camera installation: Camera should be positioned to observe an open space of 5 meters (10 max) long and 7 meters wide. If possible MOW high vegetation within this range. Avoid having moving vegetation beyond this range.



Figure 3: Camera as installed in the field. Camera is hidden in wooden beam that has been hollowed out. Two pieces of plywood are used to enclose the camera (with detection surface removed). NB: Case is still to be painted dark brown for optimal camouflage.



Figure 4: Example of photo showing cat (*Felix domestica*) in Gironde on evening of July 14th 2011, first quarter moon phase, 72°F (=22°C).

Summary for mammals monitoring

Example for 9 cameras (18 locations):

- **Number of interfaces: 3**
- **Number of replicate per interface: 6**
- **Number of location: 18**
- **Number of filming day per replicate: either 2 times during 3 weeks (in priority) or 1 time during 1 month and a half.**
- **Total number of monitoring days per replicate: 1 month and a half**
- **Total number of monitoring days : 3 months**

NB: Of course, the previous criteria will be slightly different for sites that had a few cameras stolen.

