

GUIDELINES

for installing trail cameras in nests of Egyptian vultures
(*Neophron percnopterus*) in Bulgaria



ACTION D1
EGYPTIAN VULTURE NEW LIFE PROJECT
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ABOUT THE PROJECT

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Forward

Placement of trail cameras in Egyptian vulture nest may cause disturbance and thus lead to abandonment of the nest. To prevent this, the trail cameras should be installed before the start of the breeding season and masked as best as possible, using natural materials (e.g. stones and moss). Replacement of the SD memory cards or batteries should be done no earlier than 14 days after hatching of chicks. Trail cameras should be collected after the breeding season ends.

Trail cameras

We used Body Guard trail camera with MMS function and Scout Guard trail camera. MMS trail cameras allow us to monitor vultures in real time, which provides us a possibility to react if we observe the presence of a problem occurring in the nest. However, there are some places without network coverage and the use of ordinary trail cameras is inevitable.

The Body Guard trail camera is a digital infrared surveillance camera, using 3G network triggered by any movement via highly sensitive Passive Infrared (PIR) motion sensor. The trail camera captures high quality pictures up to 30M pixels or records video clips 1080 FHD, but not both in the same time. The MMS function is very useful, because when the camera captures a picture or video less than 10M, it sends the files instantly to your mobile device or to your e-mail via GPRS network. If daylight is insufficient, the taken photos are black and white. The camera is resistant against water and snow (**Figure 1**).

The Scout Guard trail camera is a digital infrared surveillance camera, triggered by any movement by a highly sensitive Passive Infrared (PIR) motion sensor, and then automatically captures high quality 12M pictures or records video clips 720p. It is good for bird watching because it uses a black IR LEDs sensor. The camera is resistant against water and snow (**Figure 2**).



Figure 1 - Body Guard Infrared Mobile Digital Scouting Camera MG983G-30M



Figure 2 - Scout Guard trail camera- SG562-BW/SG562 12mHD

SD memory cards: We recommend using a 32GB card if the specifications of the trail cameras allow it, in order not to miss some of the important aspects of the nest biology of the species, like hatching of the young and the first days of their life.

Power Supply

Each camera uses eight batteries of a size AA. In the first year we used AA ‘Duracell’ batteries, however, in the second year we started using external UPS batteries. ‘First Power’ rechargeable battery FP 6120 (6V 12Ah/20Hr) (**Figure 3**) to optimize the energy supply and cost, and to avoid the loss of data, if the batteries run out before their replacement. One UPS battery is enough for a whole season for a Scout Guard trail camera but for a Body Guard MMS trail camera two parallel connected UPS batteries are needed (**Figure 4**). Connecting the batteries in parallel will increase their capacity, however, the battery voltage will remain the same. If you connect the batteries the other way round - "series connection" or "series-parallel connection" that will increase the overall voltage, but will not increase the capacity. Higher voltage can damage the camera. If the trail camera is installed more than 3 meters away from the UPS battery, the cable has to be thick. Electric cables have a resistance per meter, and the longer the cable, the bigger the resistance, and that results in a voltage drop. Thick cables have less resistance per meter than slimmer cables. The cable cross-section of conductors has to be not less than 0.75 [mm²]. If it is less than that, there will be losses of energy and you cannot supply the trail camera. For 5- 10 meters long cable, 0,75 [mm²] thickness of the cable is enough to supply the trail camera. In our case we use Speaker Cable 2x 0.75 [mm²] Black and Red (**Figure 5**).



Figure 3 - UPS battery - First Power rechargeable battery FP 6120 (6V 12Ah/20Hr)



Figure 4 - Parallel connected UPS batteries



Figure 5 - Speaker Cable 2x 0.75 mm² Black and Red Multi Wire Cable

Nests selection criteria

Nests selection criteria depend on the goals of the study. For our study we used to two main criteria: (i) nest occupied by a pair which have successfully bred in the previous breeding season, (i) accessibility of the nest in regard to installation and maintenance of the trail camera. We aimed to monitor at least 5 nests per year but as many as possible.. The most important aspect when installing a trail camera in a nest of Egyptian vulture (or other species) is to avoid disturbance to the birds and compromise the breeding. Installing devices inside or changing the environment of the nest could possibly repel the birds and can force them to shift to alternative, and in many cases lower quality nest. Hence, to avoid that the physical dimensions of the nest should be considered. If the nest is small in size (less than 1 m in height , width and depth) and no perching sites, ledges, curves of the cliff or other possible shapes exist in front, then mounting is not recommended. Despite the perfect camouflage of the camera, the small dimensions of the nest and the compactness of the breeding site are of a greater importance and would result in a shift of the pair to another breeding site because of the caused disturbance in their very intimate perimeter (**Figure 6**). Always big size and spacious nests with wide ledges and perch sites should be considered for trail camera mounting.



Figure 6 – Very well masked trail camera in small nests.

Installing trail cameras

Depending on the selected nests and their size the trail camera can be placed inside or outside the nest. Inside the nest you can place the trail camera in small holes and cover it with stones (**Figure 7**), or to fasten it with stones building a stone pyramid (**Figure 8**), also you can install the trail camera on a holder mounted to the cliff with screws and dowels (**Figure 9**), which is a good option for placing it outside (**Figure 10**). Cordless hammer drill is required for this purpose. In our case we used 'Einhell Power X-Change TE-HD' (**Figure 11**). It is better to have a spare battery for the drill, because in some places the rock is too solid and one full battery is sufficient only for 1-2 holes. To reach the nest, alpine equipment is needed, and in some places, you may need to attach yourself to the cliff for more comfortable work. In that case we use anchor bolt size 8 and Caving bolt hanger Pezzle (**Figure 12**).



Figure 7 - Trail camera placed in the hole in the nest.



Figure 8 - Trail camera fasten with stones building a stone pyramid.



Figure 9 - Trail camera on holder mounted to the cliff with screws and dowels (GUR-2019)



Figure 10 - Trail cameras placed on a holder outside of the nest.



Figure 11 - Einhell Power X-Change TE-HD 18 Li 18V SDS+ Cordless Rotary Hammer Drill.



Figure 12 - Anchor bolt and Caving bolt hanger.

Masking of trail cameras

The trail cameras should be masked as best as possible. It is recommended to glue small stones taken from the cliff on which the trail camera will be mounted or near it. In some places we use a little moss, wood bark, dry leaves (**Figure 13**). And we also tried with wool taken from the nest (**Figure 14**), but that material is not recommended, because in strong winds it peels off and the birds also pull it. One of the trail cameras was knocked down by something and some of the wool was obviously pulled by it. However, you have to be careful not to make the camera too heavy. It is better to mask the trail cameras in advance, because if they are masked during the installation it is much more difficult, uncomfortable and less efficient. For gluing we used Moment FIX Express, mounting montage adhesive glue for outdoor use (**Figure 15**). When you mask the trail camera you have to be careful not to cover the indication LEDs, PIR sensor and lens (**Figure 16**).



Figure 13 - Trail camera covered with stones, wood bark and dry leaves, mounted inside of the nest.



Figure 14 - Trail camera covered with wool and stones, mounted inside of the nest.



Figure 15 - Moment FIX Express

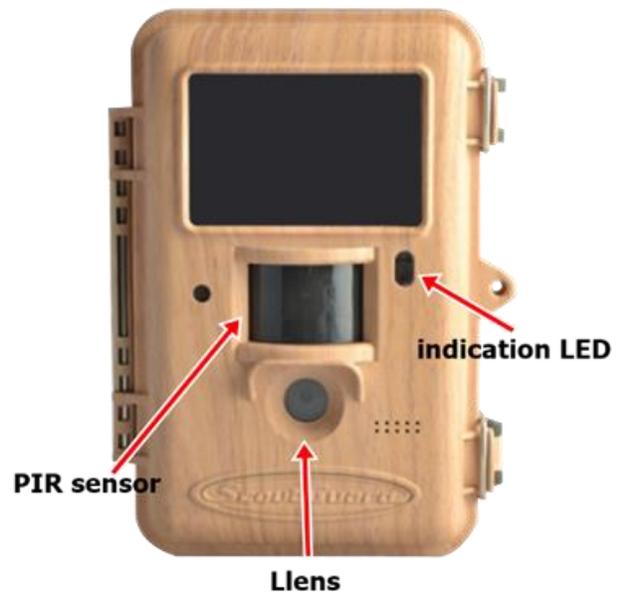


Figure 16 – Indication of the sensible parts of the trail camera that should not be covered when the device is camouflaged.

Trail camera setup

We set the trail camera to take one still image when activated by movement, with a trigger interval of 30 seconds between shots. The infrared option was set off to avoid disturbance during the night. The MMS trail cameras were set to send a 50 pictures per day to an email address using the GSM network. But this is quite expensive options, and the price depends from telecommunications tariffs of local mobile operators.