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WHY CAMERA TRAPS FAIL TO RECORD OTTER PRESENCE

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Introduction

Camera trapping, also called remote photography, turned into a useful method in wildlife research in the early 1990s, when commercial camera traps became available (Swann *et al.*, 2010). Detection of rare and elusive species, as well as observation of natural behavior, are among its applications. Compared with classic sampling methods, such as trapping, radio tracking and direct observation, photo and video trapping have the advantage of being lesser invasive despite they provide accurate data. Low invasiveness is particularly important when studying endangered species and when we would not interfere with natural behavior of wild animals. To date, there are few data on camera trapping used in river otter's studies (Stevens *et al.*, 2004; Kuhn & Meyer, 2009). This is likely due to the elusive nature of the Eurasian otter (*Lutra lutra*) that makes difficult the observation of wild individuals. This is true especially where population densities are low, as for the small population that recently colonized the **River Sangro** (**Abruzzo** region, Italy, De Castro & Loy, 2007), at the northern boundary of the species Italian range. As part of a Non Invasive Genetic Sampling of otters in this area we tested the efficiency of regular and sensor modified camera traps.

Aims

The principal aim of our study is to test the efficiency of camera trapping with Eurasian river otter in the wild, and specifically test weather body temperature could be responsible for the low detectability of the species.

Methods

In the first step of our study we used two Scoutguard SG550, triggered camera equipped with a PIR sensor. Due to the uncertainty of slides really used by otters and accounted for their habits of swimming and marking, we decided to set camera traps near marking sites, *i.e.* rocks placed in the middle of river stream.

Cameras were set to record one minute videos or three consecutive photos. Camera traps were opportunistically checked daily or weekly. Their correct functioning and placement was confirmed by videos of other species at the same sites. The sensitivity was initially set on *"normal"* but after three occasions in which we found fresh spraints but no video recorded, we used *"high"* sensitivity.

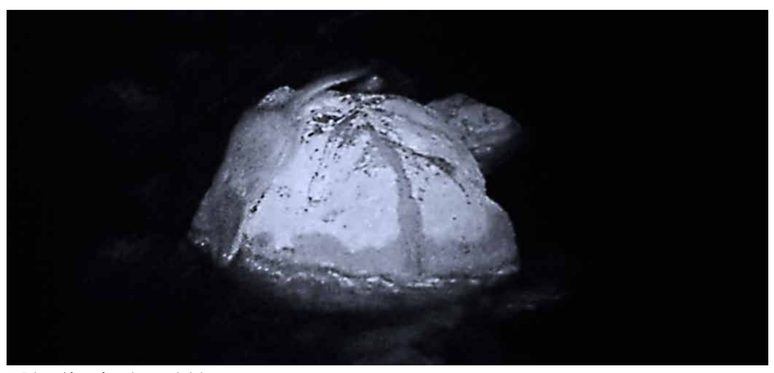
Cameras were set both with and without odor baits (rotten fish scent).

After 150 day/traps we had no image of otters and consequently we hypothesized a detection problem due to the low temperature differential between the animal and the surrounding air, especially for animals emerging from the water to mark rocks in the middle of the river course. We suspected that for animals rapidly left ingwater, marking rocks and going back to the river, time could not be sufficient to warm their body and activate cameras.

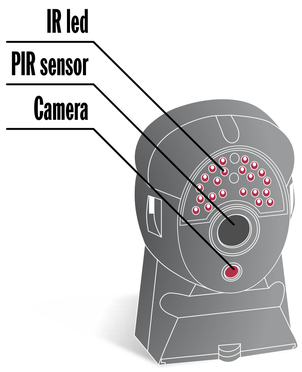
We then modified one of the two Scoutguard SG550 by adding a pressure trigger instead of PIR. In this modified trap the PIR sensor was covered to guarantee the solely pressure activation.

■ The two coupled camera trap, one equipped with standard PIR sensor and the other modified for being activated by pressure sensors

■ Marking site with pressure sensors connected to camera trap

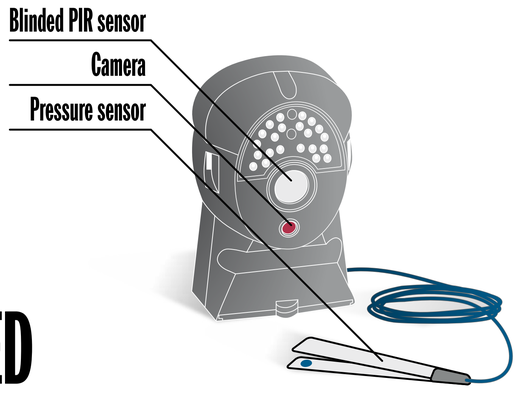


■ Enlarged frame from the recorded clip



150 DAY TRAPS

0 OTTER RECORDED



2 DAY TRAPS

1 OTTER RECORDED

Results

After 150 day/traps camera traps equipped with standard PIR sensor were not able to record any video of otter, despite the verified transit of at least one individual.

When we coupled the unmodified camera with the other provided with pressure triggers camera trap recorded a video of an otter after only two day/traps.

Discussion

Despite further data are needed to confirm our outputs, our observations strongly support the hypothesis that common camera traps might often fail to catch otters as a consequence of their low body temperature when emerging from water. This is in accordance with recent studies conducted on otters using thermocams by Kuhn & Meyer (2009). Authors clearly showed that when otters leave water their temperature equals the water temperature. Due to the high adapted isolation and thermoregulation system of river otters (Tarasoff, 1974; Kuhn, 2009) there could be difficulties for standard PIR sensors of photo and video traps to activate cameras, especially when framing marking sites closed to freshwater courses. This represents a big deal for using camera trapping in otter's monitoring programs. Improving alternative techniques will give great chances in future research studies and conservation projects.

Limits and future improvements

Future improvement of the system will be devoted to solve the short-circuit of the pressure sensors caused by the rain. But we are confident there will be improvements in our method.

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