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The Effectiveness Of Using A Masking Device For A Camera Trap In Studies Of Mammals And Birds.

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ABSTRACT

The article describes the characteristic of the camouflage device for the camera trap, which was effectively used in the study of diurnal and seasonal mammals and birds in the central part of European Russia. In the masking used, the principle of mimicry is used. The masking device makes it possible to successfully use camera traps in any season of the year with the aim of studying animals or conducting tracking in hunting facilities. Daily activity of common fox Vulpes vulpes, badger Meles meles, Eagle Owl Bubo bubo, marmots Marmota bobak.

Keywords: camera trap, daily activity, badger, common fox, marmot, Eagle Owl, Meles meles, Vulpes vulpes, Marmota bobak, Bubo bubo.

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INTRODUCTION

In modern conditions for the development of science and practice, the use of camera traps is an integral part of field research (Claridge et al. 2004, Kays and Slauson 2008, De Bondi et al. 2010, Bridges and Noss 2011, O'Connell et al. 2011, Meek et al. 2012a, Diete et al. 2014, Asykulov and Tichomirov 2015, Nabiyev et al. 2015). The mass application of camera traps in the reserves (Pchelkin and Pchelkina 2015, Sidorchuk et al. 2016), national parks, game reserves, hunting facilities causes their modernization in various ways, including in terms of disguise. By now, the technical characteristics of the survey, water resistance, the ability to work from battery and solar panels have been improved. However, camouflage qualities were not given due attention. Therefore, we proposed a masking device for camera traps, close to a natural object.

Mimesia is one of the forms of mimicry, namely the use of the coloration of the body of living organisms in order to imitate the locality in which they live. The essence of this ability of living organisms has long been used by inventors in military affairs to mask technology, weapons and other objects. In hunting farms with variable success, measures are taken to attract game with the use of planted stuffed animals. The use of camouflage devices and devices in scientific field surveys to monitor the number and daily activity of animals allows the researcher to formulate certain ecological and biological patterns about their life.

In comparison with the known maskings, the proposed by us allows to increase the camouflage of camera traps in any season of the year with the aim of studying animals in scientific terms or conducting tracking in hunting facilities. The designed masking in the form of a tree branch (with the inside of the camera trap) is attached to the natural trunk of the tree, which makes it possible to observe animals (mammals and birds), remaining unnoticed both for the animals themselves and for people visiting the forest. Using a masking device reduces the probability of finding a photo trap by a beast or a bird, and, consequently, reduces their fearfulness to an unknown object without causing stress reactions to them, and increases the possibility of fixing certain features of ecology and behavior. Also allows you to save camera traps from loss and damage, especially when used in hunting farms. Deployment of camera traps, particularly along with the high risk of the cameras and data, a problem experienced worldwide (Bancroft 2010). Scientists used different types of protection to preserve photocells, including concrete boxes on steel poles (Meek et al., 2012). In our studies on animal activity, we used camera traps and digital dictaphones (Andreychev 2012, 2017, Andreychev and Zhalilov 2017, Andreychev et al. 2015, 2016, 2017, Lapshin et al. 2018), but always wanted to disguise the devices for the objectivity of research results.

As a result of using the masking method, we are able to obtain information about the life of animals, which are not available with other studies, using camera -video recorders. The reason for this, as a rule, is the scaring away of animals and birds by a new object, which is the photo trap in the forest. The use of camouflage makes it possible to look more objectively at certain features of the vital activity of many animal species without causing stress reactions in them.

MATERIAL AND METHODS

The preliminary stage of work involves the use of bark of a certain type of tree, which is planned to attach a camera trap for monitoring animals. The lagging bark from the trunks should be removed from fallen trees, as it is most suitable for camouflage by its qualities. The device can be used both in specially protected natural areas and in hunting grounds of common use. It can also be used in enclosed enclosures for ungulate mammals. The most effective use of it on feeding grounds, on animal trails, and also at privat.

The masking device (Fig.1) of the standard camera trap (140 × 80 × 70 mm) implies the use of an invention made of linoleum, polyurethane, glue-mantle, straggling from tree trunks, fastening, the top of a rotten stump or knot. The technical result is achieved by the fact that the device includes a frame of soft material (for example, linoleum), folded in the form of a pipe and glued, so that the seam is from the side of the tree trunk. The diameter of the pipe along the outer edge is 10,4 cm. At the top, the pipe is closed with a cork of hemp or a knot of wood of the appropriate diameter, so that the inside diameter of the inserted part is 2–3 mm smaller than the diameter of the pipe. The upper edge of the pipe is flat, and the lower edge is cut under the slope, so that when attached to the trunk of the tree an angle of 35–45 degrees is formed. The maximum length along the outer wall of the pipe is 47 cm, the internal length is 31 cm. The length and diameter of the pipe are calculated in such a way that the inner lower part houses a 6V (4.5 A) battery of the

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following sizes: 96 × 68 × 42 mm; and in the upper – a camera trap. The battery and the camera trap inside the pipe are fixed by means of stops and, respectively, of a solid material (for example polyurethane) adhered from the inside to the pipe. The size of the abutment for the camera trap is 30 × 50 × 25 mm. The size of the stop for the battery is 30 × 60 × 20 mm. The distance from the lower edge of the tube to the stop for the battery is 90 mm, the distance from the upper edge of the tube to the stop for the camera trap is 135 mm. On the pipe, windows are made in such a way that they are positioned symmetrically with respect to the illumination, the lens and the camera trap movement sensor. At the junction of the upper and lower parts of the pipe, an attachment is made for the canopy of the device on the tree. Outside, the pipe is covered with bark of trees or scales.

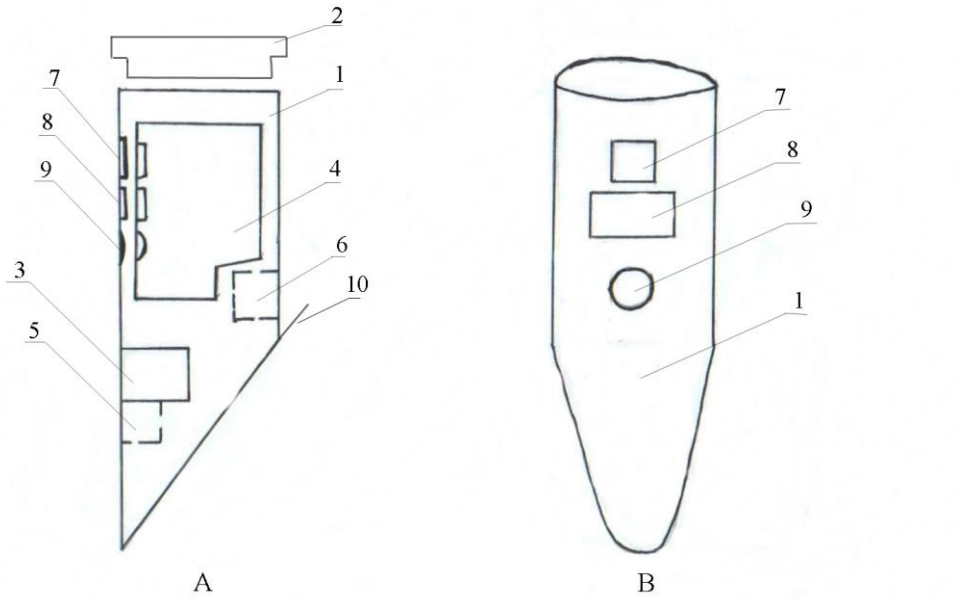

Fig 1: The scheme of the device for masking the camera trap for animal observations. Note: A – a kind of disguised camera trap on the side; B – view of the device from the front; 1 – a pipe, 2 – a stopper from the hemp saw, 3 – a battery, 4 – a camera trap, 5 – a stop for the battery, 6 – a stop for the camera trap, 7 – a window for lighting, 8 – a window for the lens, 9 – a window for motion sensor, 10 – fastening to a tree.

The device works as follows. The researcher initially determines the traces of active stay of animals on the ground using visual observations. It is necessary to pay attention to accumulations of excrement and track tracks of mammals and birds. The next stage is the selection of a tree for attaching a masking device to it, with a camera trap located inside and a battery. After installation, the researcher includes a camera trap and leaves the place. The animals get into the camera trap lens usually at night, the motion sensor triggers, and all activity of the observation objects is recorded by the camera trap on the memory card. The masking device in the form of a tree knot provides invisibility of both the camera trap and its work. Later, the researcher comes to replace the memory card and battery. Camera traps using this masking system can be located on the ground all year round, which is a significant fact in the conduct of research.

We should dwell on some particular points that make it possible to use the camouflage device of the camera trap with the greatest efficiency. When choosing the location for fixing the device, one must be guided by the ecology of the species of mammals and birds, their biotopic confinement. It is recommended to install the camouflage device in the morning, in order not to draw attention to the animals. After installing the camouflaged video and video recorders, the terrain must be brought back to its natural original state in order not to cause alertness to the animals.

When counting the cases of recording the activity of animals of different species, both video and photographs were taken into account. Used camera traps (photo / video recorders) Acorn LTL-5210MC, Acorn LTL-8210A, Hunting Trail Camera.

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RESULTS AND DISCUSSION

In the daily activity (Fig. 2) of the European badger (Meles meles) several periods of activity were noted (Fig. 3). Most badgers fell into the objectives of camera traps in the morning hours (from 6 to 8.00 h), in the evening hours (from 20.00 to 22.00 h and from 23.00 to 00.00 h). This pattern was noted for several settlements of the Bolshebereznikovsky and Dubensky districts.

Fig 2: Registration badger at the hole disguised as a camera traps.

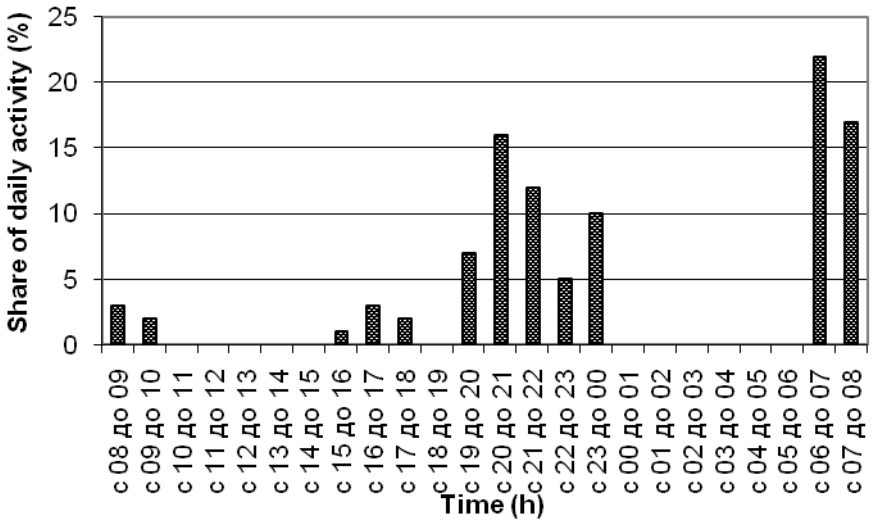

Fig 3: Daily activity of the European badger in Mordovia.

In the broods of the common fox (Vulpes vulpes), 3 to 6 puppies were recorded during the tracking time using camouflaged camera traps. Foxes are active in burrows (Fig. 4) more at night and in the morning (from 23.00 h to 7.00 h). However, night activity is not continuous, but alternates with rest intervals. A lot of activity was observed from 00.00 to 2.00 h, from 3.00 to 5.00 h and from 6.00 to 7.00 h, that is, the waking period, lasted on average about 2 h, and rest for about 1 h (Fig. 5). In the daytime, adult foxes in the burrows are practically not recorded. Only in two intervals are active: from 13.00 to 16.00 h and from 21.00 to 22.00 h. Thus, in our studies, four most pronounced periods of diurnal activity of foxes were observed: from 00.00 to 2.00 h (18%), from 3.00 to 5.00 h (8%), from 13.00 to 16.00 h (10%) and from 21.00 to 22.00 h (12%).

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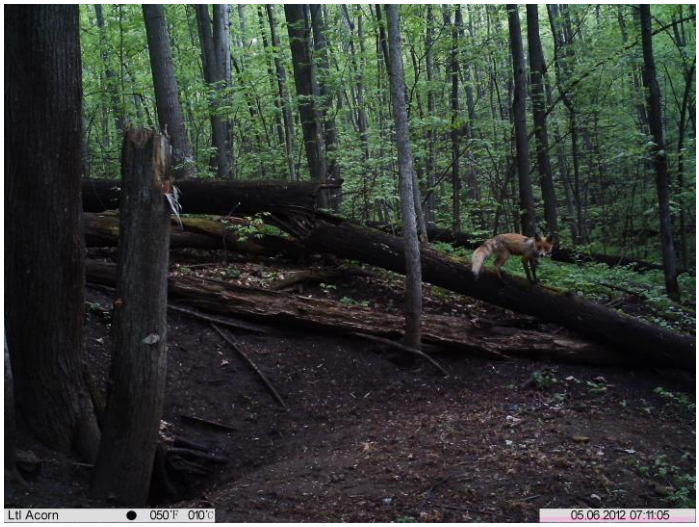

Fig 4: Registration of the fox at the burrow by a disguised camera trap.

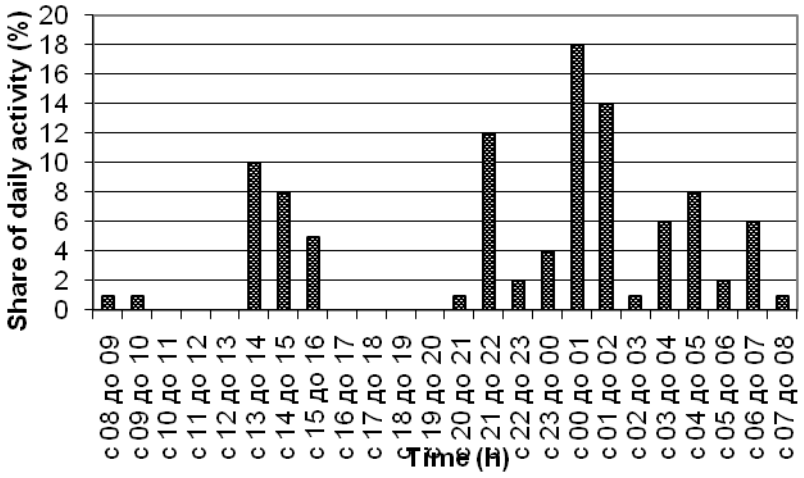

Fig 5: Daily activity of the common fox in Mordovia.

In steppe marmot (Marmota bobak) in the beginning of spring (Fig. 6) one-phase continuous activity of marmots was recorded from 7.00 to 18.00 h. In May, two-phase activity of animals is observed. In June, the activity of marmots, as well as in April, is continuous and lasts from 4.00 to 20.00 h. In July-August, the activity of marmots on the soil surface is significantly reduced. Summarizing the activity at different times of the day by seasons, two separate periods of time of increased activity of animals can be distinguished: 1) from 6.00 to 9.00 h; 2) from 1 pm to 6 pm (Fig. 7).

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Fig 6: Registration of a family of marmots at the burrow of a disguised camera traps.

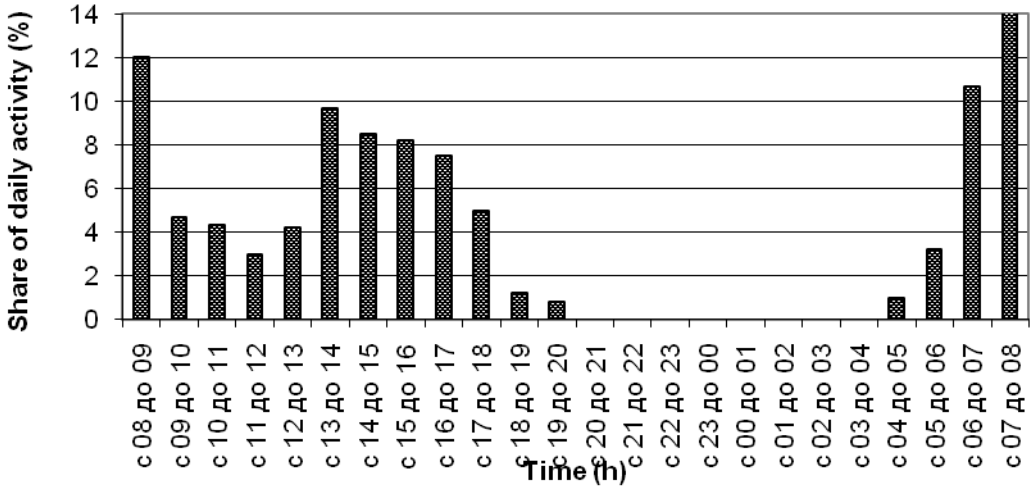

Fig 7: Daily activity of steppe marmots in Mordovia.

Fig 8: Registration of adult poultry and nestlings Eagle Owl in a nest with a masked camera trap.

Using the masked camera traps, it was possible to determine the duration of the passive and active conditions of the Eagle Owl nestlings (Bubo bubo) in the nest (Fig. 8). The duration of the passive state of chicks at the age of 1 week during the day (sleep and wakefulness) is 6–10 times greater than the active state (movement and feeding). At the end of the nesting period, the opposite pattern was observed. The duration of the active state of the owl chicks was 33 days longer than the passive state from 1.36 hours to 5.02 hours.

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