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EFFICIENT METHODS IN TRAPPING WATER RAILS (*RALLUS AQUATICUS*) AND LITTLE CRAKE (*PORZANA PARVA*) FOR BIOLOGICAL STUDIES

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SUMMARY. Water rail (*Rallus aquaticus*) and little crake (*Porzana parva*) inhabit wetlands habitats which are hard to penetrate, therefore capturing rails is quite difficult. But this method is in some cases necessary for studies on their biology We shall describe and evaluate two types of traps used in capturing little rails: Potter's traps and automatic fall traps. Potter's traps were mounted on both sides of a net wall or in a funnel formed by the nets' walls, while the automatic fall traps were located on flat polyester plates. Calculating the catching rate for water rail we found that the highest number of birds was trapped in April, when the birds return from the wintering grounds and establish their territory. The Potter traps have advantages for long term studies, in areas with constant water level and also pose a lower risk on birds, while the automatic fall traps have advantages in high fluctuating water level areas and require little effort for their installation.

Keywords: automatic fall traps, catching rate, Potter's traps, small rail.

Introduction

Water rail (*Rallus aquaticus*) and little crake (*Porzana parva*) are elusive rails species, due to their secret life, hidden in the dense marsh vegetation (Ripley, 1977; Taylor, 1998). Wetland habitats dominated by reed (*Phragmites australis*) or cattail (*Typha latifolia* or *T. angustifolia*) are really hard to penetrate, thus making rail trapping a challenging task (Kearns *et al.,* 1998).

Resolving this task allowed access to the specific biological samples (DNA, feathers and measurements) necessary in studies regarding breeding biology, philogeography and some behavioral aspects. In this paper we are describing and evaluating two types of traps used in capturing water rails and little crakes: Potter's traps (Davis, 1981) and automatic fall traps (Bub, 1991).

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Materials and methods

We used two different field designs for arranging the Potter's traps. Traps were mounted on both sides of a net wall (Fig 1A), or in a funnel formed by the nets' walls (Fig. 1B).

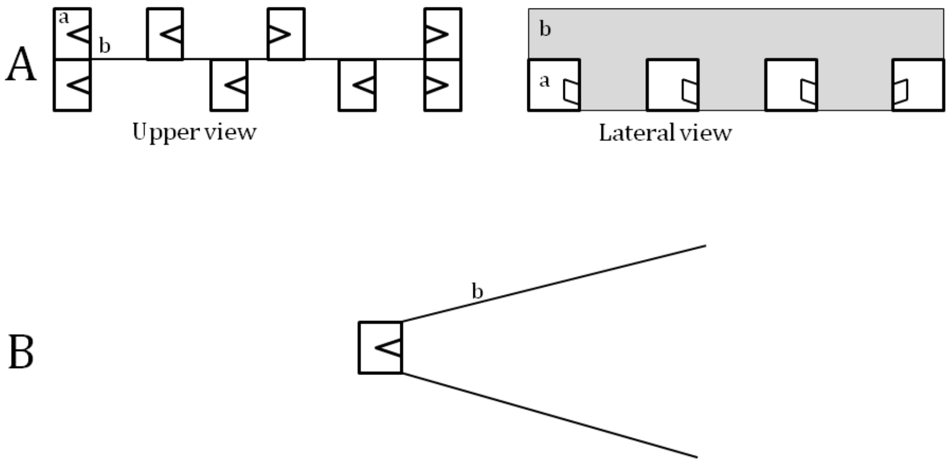

Figure 1. The mounting design of Potter's traps (a- Potter's trap, b- nets wall, A- along a nets wall and B- in a funnel nets).

The design and dimension of the traps are described in Figure 2. The Potter's traps were located on the sides of a net wall, and once the location had been selected, the vegetation was flattened with a 1.5 m long piece of wood. The transect width ranged from 1.7 -2 m, and the length varied depending on the length of the net segment. The net wall was supported and fixed on bamboo sticks. If the water level did not exceed 10 – 20 cm, the traps were fixed at the basis of the net wall. In deeper water, the traps were set at the water level.

In this study we used this type of Potter's traps distribution in three transects, located inside two reed beds where the water level generally ranged from 10 to 20 cm. Transects had a length of 20 m and contained 10 or 11 traps. In 2011 we placed inside the traps small boxes containing fly larvae as bait.

We also used three Potter's traps located on a funnel net wall. In our study three traps of this types were placed, one located in a habitat dominated by reeds, with a water level raging usually from 10 – 20 cm, and two in the habitats dominated by cattail, where the water level exceeded 1 or 1.5 m. This type of traps where checked three to four times a day, first check immediately after sunrise and last check after the night fall.

The automatic fall trap (Bub, 1991) consists of a rectangular metallic wire mesh which is attached to a parallelepiped net (Fig. 3). Located on a flat surface, it is propped with stick made of two complementary pieces, tied with a rope to the distal side of the rectangle. The bait, consisting of live fly and *Tenebrio* sp. larvae, was placed on the string (Fig. 3). Each larva was attached to the rope with a thin wire that was wrapped around it, thus keeping it alive and wiggling to attract the birds. *Tenebrio* sp. larvae, having a larger size than fly larvae, should be more conspicuous and therefore are more easily spotted by the birds.

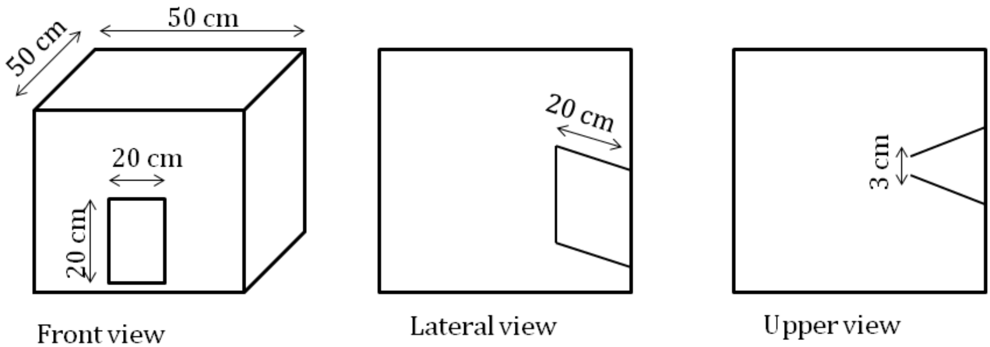

Figure 2. The design of Potter's traps.

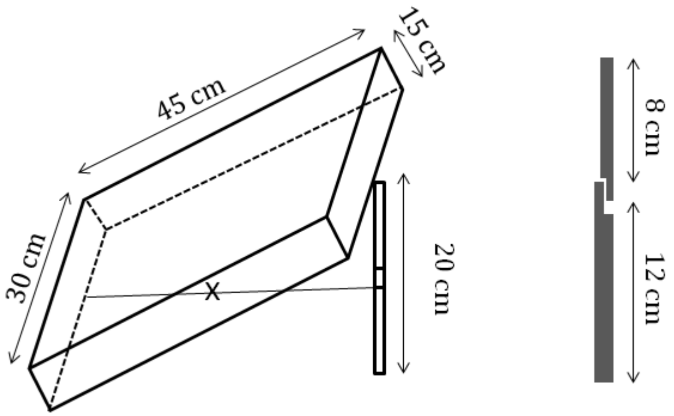

Figure 3. The designee of automatic fall traps.

We used 6 traps in habitats dominated by cattail, where the water level ranged from 1 to 1.5 m and 21 in a habitat dominated by reeds, with a water level raging usually from 10 – 20 cm. We wanted the traps to float on water even when water level fluctuated and therefore we placed each trap on polyester plates covered by reed. Traps were checked at least every two hours, or even once an hour, if the birds' density was higher or if the trap was located inside a bird territory. Frequent checks were necessary to prevent dehydration, as the captured birds had no access to water.

Traps were active from April until the end of July, in different days, from 2010 to 2012. Taking into account the number of water rails captured each month and relating it to the number of traps /days we calculated the catching rate for this species.

All the birds captured in this study were released.

Results

Throughout the entire study period we captured a total of 42 water rails (20 in 2010, 18 in 2011 and 4 in 2012, all of them with Potter's traps) and 10 little crakes (5 in 2011 - with Potter's traps, 5 in 2012 - three with a Potter's and two with the automatic fall traps). Most of the water rails were captured during the morning hours. The little crakes captured in automatic fall traps were caught during the entire day. The highest water rails catching rate (number of birds captured /day) was recorded in April and the lowest in June/July for each of the three years (Table 1).

Table 1.

The water rail catching rate ("-" represents the period when the traps were not active)

	April	**May**	**June**	**July**
2010	0.55	0.30	0.20	-
2011	0.50	0.30	-	0.06
2012	0.15	0.05	-	-

We found that traps covered with reed were more efficient than those left uncovered. Covered traps provide shelter for captured birds, decreasing the stress level and also protecting them against sun light and predators.

In addition to target species, we captured a number of other species. With the Potter's traps were also captured a spotted crake (*Porzana porzana*), four bitterns (*Botaurus stellaris*), two moorhens (*Gallinula chloropus*), six mallards (*Anas platyrhynchos*), a little bittern (*Ixobrychus minutus*), warblers (*Acrocephalus schoenobaenus, A. scirpaceus, A. atrundinaceus* and *Locustella luscinioides*), muskrats (*Ondatra zibethica*), water rats (*Arvicola amphibius*), water turtles (*Emys orbicularis*), grass snakes (*Natrix natrix*), marsh frogs (*Pelophylax ridibunda*), common spade foot (*Pelobates fuscus*), common rudd (*Scardinius erythrophthalmus*), tench (*Tinca tinca*), european weatherfish (*Misgurnis fossilis*) and crucian carps (*Carassius carassius*).

Discussions

Potter's traps installation requires a considerable effort, but they have a high efficiency over several years, as the vegetation grows around them, still not covering them, this fact being an advantage in long term studies (Table 2). The Potter's traps disadvantage is the fact that they are fixed on bamboo sticks at a certain height, and if the water level changes with more then 10 – 20 cm, they get flooded. Potter's traps should be used only in areas where the water level is relatively constant (Table 2).

Table 2.

Advantages and disadvantages in using Potter's traps or automatic fall traps

	Potter's traps		**Automatic fall traps**	
	Advantage	Disadvantage	Advantage	Disadvantage
Long term studies	x			x
High ranging water level		x	x	
Constant water level	x		x	
Installation effort		x	x	
Low Birds life risk	x			x

Covering the traps with cut vegetation, increased the trapping efficiency and also limited the stress on captured birds. Due to the limited set of data we cannot confirm the favorable effect on trapping efficiency of fly or *Tenebrio* larvae in this type of trap.

In areas with highly variable water level, we found that the automatic fall traps placed on polyester plates were more useful. Another advantage is that these traps are easy to install in the field and require less effort. The disadvantage of this traps is that the birds have no access to water, being exposed to dehydration and sun light, and therefore traps should be checked at least once every one or two hours, but frequent checks might interfere with bird activity in the area.

The highest caching rate was recorded in April, when the birds returned from the wintering grounds and established territory (Cramp and Simmons, 1980; Stermin *et al.,* 2012). During this period, especially males are very active and therefore more trappable. Once their territories and boundaries are defined, the birds activity decrease and so does the capturing rate.

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