

Is the wild boar an important nest predator in wetland areas? An experiment with dummy nests

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Fig. 1a Ground artificial nests



Fig. 1a Water artificial nests



Fig. 2 Locations of the camera nests (red circles) on the island in the Tiber River



Fig. 3 A ground nest preyed by wild boar

Introduction

The wild boar (*Sus scrofa*) is known to feed on the eggs and juveniles of ground-nesting birds (Matschke 1965; Schely & Roper 2003; Gimenez-Anaya *et al.* 2008), but its impact at the population level is still unknown. To determine the species-specific predation pressure on waterbirds nests, in 2009 we monitored the fates of artificial avian nests in several wetlands located in three natural reserves of Latium (central Italy): "Nazzano-Tevere Farfa", "Lago di Vico" and "Macchiatonda". Dummy nests proved useful to investigate predation frequency in relation to environmental variables and species presence and are often used to explore the nest predator community (Henry 1969; Berg 1996; Söderström 1999; Pedersen *et al.* 2009). To distinguish between the real consumption of eggs and the accidental destruction of nests by wild boar, in 2010 we conducted an experimental trial with camera nests. At Tevere-Farfa in the years 2008-2009 natural waterbirds nests were regularly surveyed to follow reproduction and weaning.

Site and methods

All the study sites were protected areas but they differed in extension and wetland type: "Macchiatonda": 250 ha swampy areas on the coastal plain, "Lago di Vico": 4109 ha, reed beds at a lake shore, and "Nazzano-Tevere-Farfa": 700 ha, marsh areas and islands along the river Tiber.

Dummy nests were made using local vegetation moulded as a cup on a 20x20 cm flexible metallic mesh. Each artificial nest contained two brown domestic hen eggs and a plastiline egg. Two different nest types were used, i.e. ground and water nests. Ground nests were placed onto a 40x40 cm board covered with a layer of grease on which predators left footprints (Fig. 1a). Water nests were directly anchored to the aquatic vegetation (Fig. 1b). Predators were identified by either the signs left on the plastiline or the tracks found on the board. A total of 128 dummy nests (74 on the water between the vegetation and 54 on the ground, 9 of which were placed on small islands in the Tiber River) were set out and checked every 7 days over a period of 28 days. The trial with camera nests was conducted in one island in the Tiber River (Fig. 2) that is regularly crossed by wild boars, placing 5 artificial ground nests controlled by a digital camera (model BMC Scout Guard). Each digital camera was mounted on the trunk of a tree located near the nest. All cameras were checked after 1 week.

Results

Overall, 94.4% of ground nests and 90.5% of water nests were preyed or destroyed. The wild boar preyed 40.7% of ground nests (Fig. 3) and 13.5% of water nests (Tab. 1) (mean between areas and habitats 30.1%, Fig. 4), followed by rats (*Rattus* spp., mean 19.6%), coypu (*Myocastor coypus*, 10.4%), birds (mainly corvids, 8.6%), carnivores (4.4%), and snakes (1.1%) ($\chi^2_{(5)} = 47.0$, $P < 0.001$). Unidentified predators accounted for 18.0%.

Predation on ground and water nests (four predator taxa considered: wild boar, coypu, rats and other taxa) differed significantly according to taxa ($\chi^2_{(3)} = 15.58$, $P < 0.001$), with a prevalence of predation by wild boar on ground nests and by rats and coypu on water nests.

Three out of the 5 camera nests were preyed by wild boars. The photos clearly show the animals eating the eggs and destroying the nest (Fig. 5).

Surveys at Tevere-Farfa showed that 18% (N=55) of mallard (*Anas platyrhynchos*) nests were preyed or destroyed by wild boars, while 15% (N=27) of Eurasian coot nests (*Fulica atra*) were preyed or destroyed by coypu.

Discussion

The wild boar resulted the most important predator of artificial nests resembling those of waterbirds, preying or destroying nearly one-third of the nests, especially those placed on the ground including those on islands. Other important predators were coypu and rats. The use of camera nests confirmed that wild boar actually search for and eat the eggs, showing that nests were not accidentally destroyed by animals walking on them. Although artificial nests are only a simulation of the real world, there is evidence that the overall proportion of nests preyed by different species may be assumed to be similar for dummy and real nests (Söderström 1999). Interestingly, data collected from real nests at Tevere-Farfa showed that predation by wild boar on mallards' ground nests and by coypu on aquatic Eurasian coot nests was quite similar to dummy nest predation by each predator species.

According to our study, the wild boar should be considered an important nest predator in wetland areas. The potential impact of this species to waterbirds nests should thus be considered in the planning and management of conservation areas.

Tab. 1 Predation by species

	Ground nests		Water nests	
	N	%	N	%
Wild boar	22	40.7	10	13.5
Coypu	4	7.4	8	10.8
Rats	5	9.3	27	36.5
Carnivores	3	5.6	5	6.8
Birds	4	7.4	5	6.8
Snakes	0	0.0	2	2.7
Others	13	24.1	10	13.5
Not preyed	3	5.6	7	9.5
Total	54		74	

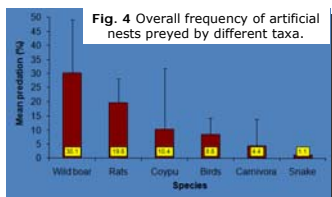


Fig. 5 Wild boars eating eggs in an artificial nest

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