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On the Danger of Using Dummy Nests to Study Predation

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Because the nests of ground-nesting birds are often hard to find, dummy nests were used in many early studies of egg predation (e.g. Balser et al. 1968, Chesness et al. 1968, Henry 1969, Jones and Hungerford 1972). Predation on dummy nests is different from natural waterfowl nests (Dwernychuk and Boag 1972), and dummy nests often are used without verifying that the results are similar for natural nests (e.g. Göransson and Loman 1982, Andrén et al. 1985, Angelstam 1986, Müller 1986, Sugden and Beyersbergen 1986).

Storaas (1988) showed that predation on dummy nests differed from that on real nests of Common Capercaillie (*Tetrao urogallus*) and suggested that dummy nests were more vulnerable than natural nests to visual predators. We found that predation on dummy nests was an unreliable index of predation on natural nests of Eurasian Black-Grouse (*Tetrao tetrix*) and used radio-tagged eggs to show that dummy nests were robbed mainly by birds, whereas natural nests attracted more mammalian predators.

In 1984–1987 natural black-grouse nests were found by radio-tagging 18–25 hens before or during the mating period each year in a 32-km² study area (61°N, 16°E). Dummy nests, each with 5 or 6 eggs, were established 20–100 m from forest roads in a similar way each year. Fifty dummy nests were laid out each year from 1984 to 1986, and 25 were used in 1987. Pheasant eggs were used in 1984 and similar-colored chicken eggs in the other years. Nests were placed in sites that resembled natural nest sites as nearly as possible, were exposed for 20–24 days, and were revisited on the last day of exposure. The comparison of natural and dummy nests was confined to hens that either hatched eggs or had their nests disturbed during the exposure period. This was the period when most natural egg predation took place.

Radio-tagged eggs were prepared by carefully cutting a 10–15-mm-wide cap from the blunt end of the egg and removing the fluid content. After the transmitter (Biotrack, U.K.) was inserted, the egg was filled with paraffin and sealed with the removed cap. In 1985–1987, 1 radio-tagged egg was placed in 12–20 natural nests each year and checked daily by recording its position. In 1987, 1 radio-tagged egg was placed in each of the 25 dummy nests and checked 5 times during exposure.

When radio-tagged eggs were found within 10 m of robbed nests, bite marks or beak marks could always be used to distinguish between mammal and bird predation. All of the 25 eggs taken farther away were cached by the predator. Fifteen had been covered with earth in a way typical for mammals; 5 of these eggs had bite marks or were from nests where the hen had been killed by a mammal, and 10 eggs were without marks. Of 10 eggs hidden in the vegetative layer of the ground and covered by grass and debris, 3 had beak marks. Because none of the other 7 eggs had bite marks, we assumed that they too had been taken by birds.

About 50% of natural nests were subject to predation each year (Table 1), with no significant between-year differences (Chi-square, $P > 0.25$, two-tailed). Predation on dummy nests was significantly higher in 1986 and 1987 than in 1984 and 1985 (Chi-square, $P < 0.005$, two-tailed). In 1984–1985 predation on natural nests significantly exceeded that on dummy nests (Chi-square, $P < 0.01$, two-tailed). Predation on both natural and dummy nests was similar in 1986 and 1987, however, because of the increase in predation on dummy nests without a similar increase on natural nests.

In 1987 dummy nests were robbed mainly by birds (2 taken by mammals, 9 by birds). The natural nests attracted mainly mammalian predators (8 by mammals, 1 by birds) (Fisher exact, $P < 0.02$, two-tailed). The predator that destroyed 2 dummy nests was not identified because the radios failed. Mammals were also important predators on natural nests with radio-tagged eggs in 1985 (4 by mammals, 2 by birds) and 1986 (4 by mammals, 3 by birds).

Previous studies have stressed the importance of bird predation on dummy nests. Andrén et al. (1985) reported that predation on dummy nests was correlated with corvid abundance, and Angelstam (1986) found that dummy nests, set on boards smeared with grease to identify predators, were destroyed mainly by birds. Correlations between predation and nest cover have also suggested that birds are important predators on dummy nests (e.g. Jones and Hunger-

TABLE 1. Predation on natural Eurasian Black-Grouse nests and on dummy nests exposed in the same period. Numbers of nests are given in parentheses.

	1984	1985	1986	1987
Natural nests	50% (16)	46% (13)	47% (15)	47% (19)
Dummy nests	12% (50)	12% (50)	46% (50)	52% (25)

ford 1972, Sugden and Beyersbergen 1986, Storaas 1988). We found, however, that natural nests, exposed during the same period as dummy nests, were robbed mainly by mammalian predators. We speculate that these are probably attracted by the scent of the sitting hen or by her trails because she usually walks off the nest (pers. obs.). Mammals may fail to detect dummy nests that lack the scent of a hen (Storaas 1988) or may avoid dummy nests because they initially smell of humans (Fjeld and Sonerud 1984).

We do not know why predation on dummy nests increased in 1986, but corvids may have learned to search for dummy nests (Picozzi 1975). The predation rate on natural nests did not change. We conclude that predation on dummy nests is a poor index of predation on natural nests of Eurasian Black-Grouse and probably overestimates the importance of bird predation.

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Uterovaginal Sperm-storage Glands in Sixteen Species with Comments on Morphological Differences

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Sperm-storage glands (SSGs) in the uterovaginal junction (UVJ) of the oviduct play an essential role in reproduction in domestic bird species (Bobr et al.

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1964a, b; Van Krey et al. 1967). Sperm that is introduced to the female's reproductive tract is stored in SSGs, and then released and transported to the infundibulum, where fertilization takes place (Lake 1975). Discovery of SSGs in several wild species has led to consider speculation regarding their significance (e.g. clutch size, mating systems; see Lake 1975, Cheng et al. 1983, Davies 1983, Hatch 1983, Fitch and