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Identifying crucial factors for nest survival and predation in a northern lapwing *Vanellus vanellus* population in the Lake Neusiedl – Seewinkel National Park

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Keywords

pasture, nest, predators, nest loss, hatching success, artificial nests, defense,anti-predator defense, conservation, colony size

Summary

In the last decades, lapwing populations decreased dramatically all across Europe due to shifts in land use and agricultural intensification. Knowledge of the threats to a species is essential to design appropriate conservation measures. Nest loss and insufficient productivity in the remaining habitats have been main causes for declines in the lapwing.

In this study, the causes for and the factors determining nest loss in the lapwing in the Neusiedler See – Seewinkel National Park were investigated in the spring and summer of 2014.

Clutches were recorded and monitored until they hatched or failed and the fate of each nest was assessed. Additionally, data on vegetation and ground humidity at the nest sites were gathered to test for effects of habitat variables on hatching success. Nest temperatures were recorded through temperature data loggers to record if diurnal or nocturnal predators were involved in nest predations. Artificial nests were deployed at the study site and monitored until they were predated. The results were also used to demonstrate the strong anti-predator defense of lapwing colonies. Trail cameras monitored artificial nests to reveal potential predators.

59% of the nests were predated during incubation. Only 2.5% of failed nests did so due to other reasons than predation. Nest survival probabilities differed significantly between different colony sizes (> 5 nests: 55%, 2-5 nests: 14.8%, solitary nests: 3.5%). Colony size was the only statistically valid predictor for nest loss probability. Vegetation cover, sward height and ground humidity at the nest site, as well as rainfall did not prove to be significantly related to nest loss. Predation risk of artificial nests was negatively correlated with the distance to the next four lapwing nests.

According to nest temperature logger data, nocturnal/mammalian predators were the main predators of lapwing nests. On the other hand, all predations of artificial nests recorded on trail cameras were carried out by corvids. Hence, artificial nest exposure experiments can be unreliable when aiming to identify important predators.

Our results emphasize the importance of sufficiently large areas of suitable habitat, where lapwings can develop colonies, where nests have a significantly higher hatching success than solitary nests on small habitat patches.

Figure 1:Adult female northern lapwing

Figure 2: A nest of a lapwing at the study site

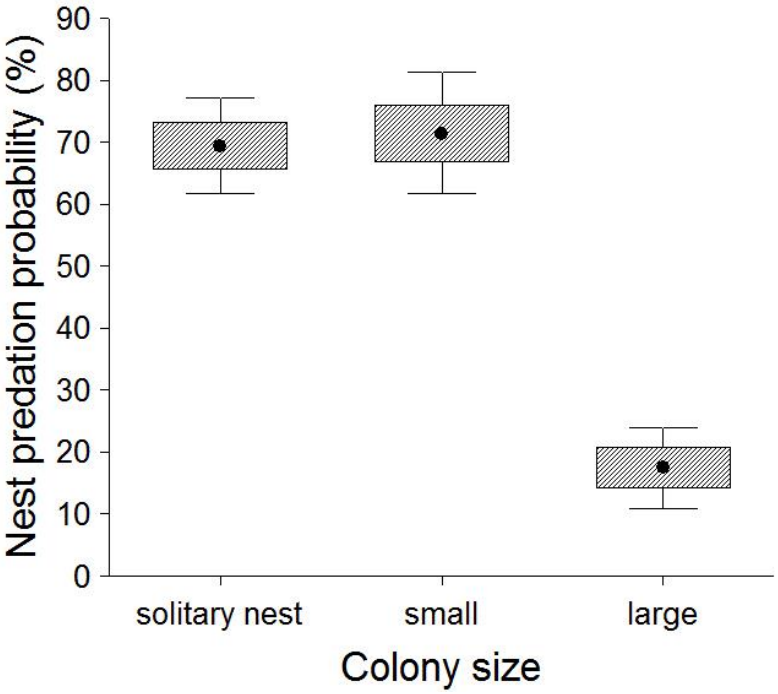

Figure 3: Mean nest predation probabilities ± SE (box) and 95% CI (whiskers) predicted by a GLMM for solitary nests, nests in small (2-5 nests) and large colonies (> 5 nests).

References

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