

Research Paper

Behavioural Responses of European Roe Deer to Temporal Variation in Predation Risk

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Abstract

In natural environments, predation risk varies over time. The risk allocation hypothesis predicts that prey is expected to adjust key anti-predator behaviours such as vigilance to temporal variation in risk. We tested the predictions of the risk allocation hypothesis in a natural environment where both a species-rich natural predator community and human hunters are abundant and where the differences in seasonal and circadian activity between natural and anthropogenic predators provided a unique opportunity to quantify the contributions of different predator classes to anti-predator behaviour. Whereas natural predators were expected to show similar levels of activity throughout the seasons, hunter activity was high during the daytime during a clearly defined hunting season. According to the risk allocation hypothesis, vigilance should then be higher during the hunting season and during daytime hours than during the non-hunting season and night-time hours. Roe deer (*Capreolus capreolus*) on the edge of Bialowieza Primeval Forest in Eastern Poland displayed vigilance behaviour consistent with these predictions. The behavioural response of roe deer to temporarily varying predation risks emphasises the behavioural plasticity of this species and suggests that future studies of anti-predator behaviour need to incorporate circadian variation in predation pressure as well as risk gradients of both natural and anthropogenic predators.